Abstracts*}

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SPEAKERS ABSTRACTS

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THE MBS METHOD AS POINT OF CARE TEST (POCT) FOR A FAST DIAGNOSIS OF URINARY TRACT INFECTIONS: A PRELIMINARY CLINICAL STUDY

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The urinary tract infections (UTIs) are the leading cause of acquired infections in a hospital with a prevalence of 40% in respect of all nosocomial infections. The diagnosis is confirmed by urine culture that often requires long response times (1-2 days), while a rapid confirmation of the diagnosis of UTI is essential to avoid damage to the renal parenchyma. This reason has led to the development of microbiological POCTs that are now available for several microorganisms, although until now there are no POCTs for a rapid count (few hours) of total viable bacteria (TVC) in urine.

Roma Tre University (Rome, Italy) developed an alternative method for the selective assessment of the bacterial load, called Micro Biological Survey (MBS) method. The MBS method is based on a colorimetric test performed in reaction vials that are single-use and ready-to-use. A sample (including urine) can be inoculated in the reaction vials without any preliminary treatment. In a previous “in vitro” study, using artificially contaminated urine samples, we have demonstrated that the MBS method provided results that were in line with the reference method of colony count on PCA medium for the bacterial species most commonly present in UTIs.

The experimental work here presented verified the effectiveness of the MBS method as POCT for a timely diagnosis of UTI in patients hospitalized in the Department of Emergency Medicine of the S. Andrea Hospital in Rome. The definition and diagnosis of UTI corresponds to the presence in the urine of a microbial load \( \geq 10^5 \) CFU/ml and the results obtained indicate that the MBS method was able to detect in the urine a bacterial load \( \geq 10^5 \) CFU/ml in less than 5 hours. The analytical results on the bacterial load into urine of hospitalised patients provided by MBS method were very similar to the analytical results provided by the traditional method of urine culture carried out by the Hospital laboratory, demonstrating that MBS method as POCT is able to made a diagnosis a UTI in less than 5 hours.

THERAPEUTIC HYPOTHERMIA POST CARDIAC ARREST: “ARE WE THERE YET?”

Cynthia Bascara

Therapeutic Hypothermia is reducing body temperature to 32°C - 34°C within 6-8 hours after return of spontaneous circulation and continuing to cool the body for 12-24 hours. The hypothesized benefits include decrease in production of excitotoxins and free radicals, suppression of apoptosis, and other inflammatory reactions reducing cerebral edema. Therapeutic Hypothermia can decrease metabolic activity leading to reduction in oxygen consumption therefore decreasing ongoing cerebral edema. Randomized clinical trials has shown that Therapeutic Hypothermia using conventional cooling methods, improve the rate of survival to hospital discharge and neurologic outcomes in patients successfully resuscitated after cardiac arrest compared to traditional standard of care.

There are common adverse events resulting from Therapeutic Hypothermia. Some approaches to these adverse events are evidence-based. But despite significant number of research studies involving different components of Therapeutic Hypothermia, some of the approaches used still remain to be results of anecdotal experience or expert opinion. Data from the Hypothermia Registry and benchmarking, both internal and external assist in quality improvement strategies. Understanding the physiological/pathophysiological effects of hypothermia and combining Therapeutic Hypothermia with other bundles of care post cardiopulmonary resuscitation are key factors for its effective clinical benefits.

NEURORADIOLOGY OF ACUTE STROKE

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The accuracy and clinical effectiveness of diagnostic imaging in patients with acute ischemic stroke require the evaluation of prospective studies on large populations able to assess different and progressive levels of diagnostic skills:
1. Ability to identify the ischemic lesion and the arterial disease that possibly underlies it.
2. Availability.
3. Diagnostic accuracy.
4. Impact on outcome and therapeutic.
5. Impact on social costs.
In the assessment of ischemic stroke is necessary to consider the following moments as a function of the pathogenic treatment options and prognosis:

1. The ischemic stroke excludes the presence of hemorrhagic lesions or disease that may clinically mimic cerebral ischemia. Both CT and MRI are able to identify the presence of a hemorrhagic lesion. Randomized trials with large series have documented that the TC, used to exclude the presence of a hemorrhagic lesion, is of benefit in the treatment of the patient with cerebral stroke with rTPA. Trial with smaller populations in Phase 2 who used MRI technique to exclude the presence of hemorrhage have documented a similar benefit in the treatment with desmoteplase with low dosage. MRI is commonly considered superior to CT in the characterization of vascular lesions that can mimic stroke.

2. Vascular pathology. Both CT angiography and MRA can identify stenosis or vascular occlusion. Digital subtraction angiography is the gold standard in this field but is limited to possible therapeutic phase. The substantial advantages angio-CT compared MRA are substantially in the easier access (all patients perform a TC at the entrance), performance (both in terms of time and simplicity of the post-processing) and panoramic views (“cover” from the arch to the intracranial circulation with reduced amounts of contrast and acquisition time of less than 20 seconds). The analysis of the partitions CT angiography in intracranial level provides an index of the final infarct volume.

3. Brain tissue at risk. The differential diagnosis between brain tissue at risk and oligaemia is perhaps the most complex and is based on studies of perfusion. Perfusion can be evaluated with both CT and MR imaging. CT has the advantage of a quantitative evaluation but limited in space (in function of the type of equipment): MRI advantages and disadvantages opposites. Although the accuracy of CT and MR perfusion studies is not perfect compared to the reference standard (PET oxygen extraction fraction), they provide an estimate of the tissue at risk of ischemia.

4. The brain tissue irreparably damaged. The presence of this tissue already in the acute phase represents a risk factor in the reperfusion. CT can identify cytotoxic edema as an hypo-dense area and when this exceeds 1/3 of the middle cerebral artery territory distribution or a score of less than 8 on ASPECTS, treatment with r-TPA is contraindicated. MRI with diffusion sequences has a sensitivity superior to CT in identifying cytotoxic edema. There are, to date, trials that have defined the relationship between diffusion and thrombolysis. There are ranges of diffusion abnormalities that indicate unfavorable outcome even in patients treated with i.v. thrombolysis. Perfusion studies either with CT or MRI did not provide data able to be used to treat patients in the clinical practice.

NON-INVASIVE BIOMARKERS FOR NON-ALCOHOLIC STEATOHEPATITIS (NASH)

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Non-alcoholic fatty liver disease (NAFLD) is increasingly being diagnosed worldwide and considered to be the commonest liver disorder in Western countries. NAFLD is the liver manifestation of the metabolic syndrome and closely associated with obesity and insulin resistance. It comprises a disease spectrum ranging from simple steatosis (fatty liver) through non-alcoholic steatohepatitis (NASH) to fat with fibrosis and, ultimately, cirrhosis. Simple steatosis is largely benign and non-progressive, whereas NASH can lead to cirrhosis, liver failure and hepatocellular carcinoma. The “gold standard” for diagnosis and staging of NAFLD is a liver biopsy. However, this is limited by sampling bias, cost, morbidity, and subjectivity of interpretation. Rather than performing a biopsy, the identification of NAFLD, inflammation and fibrosis may be identified from prespecified multimodal biomarker data, including serum analytes and/or imaging tests like MR elastography or Fibroscan. The serum biomarkers include direct markers linked to matrix deposition, matrix degradation, and cytokines and chemokines linked to liver fibrosis. Other indirect biochemical tests have been empirically correlated with fibrosis stage on liver biopsy, including the AST/platelet ratio, the Fibrotest, and AST/ALT ratio. The imaging tests have also evolved. Now that many new therapies are being assessed for anti-fibrotic effects (i.e., LOX12 inhibitors, NADPH oxidase inhibitors, LPAR1 antagonists, CB1 antagonists etc.), there is a need to develop non-invasive biomarkers to first stage the extent of liver fibrosis and then to monitor the fibrosis with a therapeutic intervention.

ANAPHYLAXIS: TREATMENT IN EMERGENCY AND PREVENTION

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Anaphylaxis is a disease of modern times. In 2010 we published the position paper on anaphylaxis in Italian Journal of Allergology and Clinical Immunology. The importance of syndrome is underlined by several papers in literature, as the last one of the European Academy
Adrenaline is the hinge drug of anaphylactic reaction. Drugs such as corticosteroids, antihistamines, and others are to be considered for target organ of anaphylaxis. The massive histamine release causes vasodilation that leads to the loss of more than 50% of the circulating liquid mass in a few minutes. The continuous monitoring of blood pressure is essential. There is increasing evidence that the heart is the target organ of anaphylaxis. The term of anaphylaxis was introduced by Charles Richet (1850-1935) for the first time to the early years of the twentieth century. Richet introduced the term “anaphylaxis” to indicate the removal from protection, in contrast to the “prophylaxis”, which induces the hypovolemic shock. The massive histamine release causes vasodilation that leads to the loss of more than 50% of the circulating liquid mass in a few minutes. The continuous monitoring of blood pressure is essential. There is increasing evidence that the heart is the target organ of anaphylaxis. The completeness of anaphylactic reactions are related mainly to genetic background including age, sex, pregnancy, ethnicity, socio-economic factors, as well as to the co-morbidities as atopy, mastocytosis, asthma, cardiovascular diseases, neurological, psychiatric and neuromuscular disorders or joint and drug use. Our preliminary data demonstrated a role of obesity and related diseases, including hypertension, glucose metabolic disorders, atherosclerosis. Adipokines play a growing role. Anaphylaxis might be immune mediated or might occur through direct (nonimmune) perturbation of mast cells. Our previous studies demonstrated the role of neuroinflammation. Idiopathic anaphylaxis, currently a diagnosis of exclusion, presents opportunities for elucidation of pathophysiological mechanisms.

Anaphylaxis is frequent (more than 6 episodes/year or more, than 2 episodes in 2 months) and infrequent (less than 6 episodes/year or 2 episodes in more than 2 months). Clinical criteria are defined in the recent international EAACI, anaphylaxis guidelines. The differential diagnosis of anaphylaxis includes medical diseases which affect the organs or systems most frequently involved in anaphylaxis. For example special attention in the differential diagnosis should be given to vasodepressor (vasovagal) reactions. Characteristic features of this reaction include hypotension, pallor, weakness, nausea, vomiting, and diaphoresis. Flushing episodes can mimic anaphylactic events. Several drugs or other conditions that cause flushing must be considered, including gastrointestinal and thyroid tumors, the carcinoid syndrome, pheochromocytoma, hyperglycemia, postmenopausal flush, alcohol-induced flushing, and the red man syndrome caused by the administration of vancomycin. According to the guidelines of the Resuscitation Council of the United Kingdom the management of anaphylaxis is based on ABCDE terms, where A is Airway patency, B is Breathing, C is Circulation parameters, D is Disability for neurological parameters and E is Exposure for skin and mucosal changes. According Simon, anaphylaxis may be killer allergy.

The risk and the severity of anaphylactic reactions are related mainly to genetic background including age, sex, pregnancy, ethnicity, socio-economic factors, as well as to the co-morbidities as atopy, mastocytosis, asthma, cardiovascular diseases, neurological, psychiatric and neuromuscular disorders or joint and drug use. Our preliminary data demonstrated a role of obesity and related diseases, including hypertension, glucose metabolic disorders, atherosclerosis. Adipokines play a growing role. Anaphylaxis might be immune mediated or might occur through direct (nonimmune) perturbation of mast cells. Our previous studies demonstrated the role of neuroinflammation. Idiopathic anaphylaxis, currently a diagnosis of exclusion, presents opportunities for elucidation of pathophysiological mechanisms.
Anaphylaxis emergency action plan should list the most common symptoms and signs of anaphylaxis and emphasize prompt epinephrine injection, followed by transportation of the individual to the nearest hospital emergency department, because treatment for biphasic or prolonged anaphylaxis might be required.

All individuals known to be at risk for anaphylaxis should be equipped with accurate medical identification listing their confirmed trigger factor or factors and their relevant comorbidities and concurrent medications. Available options include wallet cards and medical identification jewelry, with or without an embedded medical record. The jewelry might not be practical for some at-risk individuals because of initial and ongoing expense, lack of durability, and potential for exacerbating atopic dermatitis—eczema or contact dermatitis. Up-to-date information about life-threatening allergies should be accurately documented in an individual’s electronic and paper medical records, which should be labeled or flagged to denote high risk. Electronic pagers and alarm systems might be useful in reducing morbidity and mortality from anaphylaxis; however, prospective studies of these devices are needed in this context.

The life-saving pharmacologic effects of epinephrine, including vasoconstriction, decreased mucosal edema, bronchodilation, and decreased release of histamine, tryptase, and other mediators of inflammation, cannot be divorced from pharmacologic effects such as pallor, anxiety, tremor, and palpitations, which are perceived as adverse effects. Serious adverse effects are rare. Anaphylaxis from insect stings can be almost entirely prevented by use of allergen-specific immunotherapy initiated by an allergy-immunology specialist, and protection is long lasting. Hyposensitization strategies are effective for seminal fluid–induced anaphylaxis also.

Because anaphylaxis is to consider “killer allergy”, anaphylaxis education for individuals at risk and their caregivers, and for the general public is necessary and it include the knowledge of some questions.

Who is at risk? Anyone, especially those allergic to foods such as peanut, tree nut, seafood, fin fish, milk, or egg, or to insect stings or bites, natural rubber latex, or medications.

When can it happen? Within minutes, anytime the allergic person comes in contact with his or her trigger.

How do we know? Several symptoms occur at the same time, such as itching, hives, flushing, difficulty breathing, vomiting, diarrhea, dizziness, confusion, or shock.

Where can it happen? Anywhere, such as home, restaurant, school, child care or sports facility, summer camp, car, bus, airplane.

What should we do? Inject epinephrine, call 118 or local emergency medical service number, and notify the individual’s family (in that order)!

Act quickly. Anaphylaxis can be mild, or it can be fatal.

Why is follow-up needed? Anaphylaxis can occur repeatedly. The trigger needs to be confirmed, and long-term preventive strategies need to be implemented. (Simon)

In conclusions further development of an optimal diagnostic test for anaphylaxis and adequate algorithms to predict future risk and prevent fatality are urgently needed.

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EFFECT OF MUSIC ON HEART FAILURE PATIENTS: A STUDY PROTOCOL FOR A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND: Current guidelines introduce non-drug treatments that may be included in heart failure (HF) care. The use of specific music may improve the clinical stability, to prevent the exacerbation of symptoms and contributes to the reduction of costs in the HF symptoms management.

METHODS: Conceptual framework is psychoneuroimmunological. The purpose is to test music effects on HF patients. Music therapy protocol is developed in according to the best Checklist for Reporting Music Based Intervention. The research hypotheses generated by the conceptual framework are: quality of life will be higher in music group (MG) compared to control group (CG). First aid access, hospitalization and mortality will be lower in MG compared to CG. Self-care, HF somatic perception, health status perception, quality of sleep, anxiety, depression and cognitive status will be better in MG compared to CG. Blood pressure and heart rate will be better in MG compared to CG. RCT is multicenter, longitudinal, controlled versus non-intervention with parallel-groups, conducted in Italy. RCT is in according to the CONSORT stand for Consolidated Standards of Reporting Trials. The inclusion criteria are: confirmed diagnosis of HF; NYHA functional classification I to III, including patients with preserved ejection fraction and with a reduced ejection fraction; discharged from hospital; signed informed consent. Patients will be excluded if they show: deafness; severe neurological disorder; severe psychiatric disorder; cognitive deficit, consciousness reduction. Participants are assigned with ratio of 1:1 allocation by software randomization. Data collectors will enrol HF patients in outpatient cardiology and will collect baseline data. Blinded outcome assessors will collect data at 1st, 2nd and 3rd month through telephone interviews to all patients for follow-up. Playlist, produced by first researcher with the most important Italian musicologist, has 150 different classical pieces, listenable by headphones, at home by smart phone, tablet or CD. Listen data will be recorded by our new App or diary. Dosage is an one-time single dose of 30-minute session per day, at 50-60 decibels, at 60-80 BPM. Primary endpoint is the quality of life. Secondary endpoints: first aid access, hospitalization, mortality, self-care, HF somatic perception, health status perception, sleep quality, anxiety, depression, cognitive state, blood pressure, heart rate. Socio-demographic and clinical questionnaire will collect data at baseline. For sample size, with two balanced groups, a medium effect size (d = 0.5), α error of 5%, a power of 80%, with sample different expectation of 10 points at the MLHF Questionnaire to detect differences between groups, a drop-out of 10% for group, would be necessary to enrol 75 subjects per group.

CONCLUSION: This is the first RCT on music effects on HF patients which proposes a new non-pharmacological intervention, a simple HF self-care instrument, for every day, in every hour, at home, at very low cost, that could be integrated in HF care.

LUNG ULTRASOUND FOR THE EVALUATION OF EXTRAVASCULAR LUNG WATER AFTER THORACIC SURGERY

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Objectives: Following thoracic surgery extravascular lung water (EVLW) increases because of altered fluid dynamics and vascular permeability. This causes alveolar-interstitial syndrome (AIS) that impairs gas exchange resulting in severe cardiopulmonary complications. The
ultrasonic diagnosis of AIS is made by the identification of B-lines originating from water-thickened interlobular septa, and their absolute number is strictly correlated with the volume of EVLW. The aim of this prospective cohort study was to investigate the role of lung ultrasonography (LUS) to assess the variation in EVLW following major pulmonary resection.

Methods: EVLW was assessed by a semi-quantitative method, at baseline and on postoperative Days 1 and 4, through LUS using a 3.5 MHz convex probe, with patients undergoing lobectomy or pneumonectomy being examined in the sitting position. Four subregions were identified in the unviolate haemithorax and B-lines were quantified according to a four-level scale analyzed jointly using a proportional odds model for repeated measures with baseline values as covariates. In the same days we determined the respiratory ratio PaO₂/FiO₂ and estimated fluid retention by measuring brain natriuretic peptide (BNP).

Results: Forty-eight men and 26 women underwent 64 lobectomies and 10 pneumonectomies; their mean age was 64.2. At baseline B-lines were absent in 63 of 74 patients and the mean BNP value was normal. At the time of extubation a significant inverse correlation was found between B-lines value and the PaO₂/FiO₂ respiratory ratio (OR-0.72; 95% CI 0.55-0.92; \( P = 0.0096 \)). As compared to baseline there was a significant peak in the B-lines on postoperative Day 1, as well as a significant positive association between B-lines and BNP (OR-1.00537; 95% CI 1.00295-1.00779; \( P < 0.0001 \)).

Conclusions: Our results show that following major thoracic surgery LUS is able to estimate increases in EVLW. The number of B-lines is correlated to the BNP value and provides reliable information on the presence of AIS before it becomes clinically apparent.

Disclosure: No significant relationships.

B-TYPE NATRIURETIC PEPTIDE FOLLOWING THORACIC SURGERY. A PREDICTOR OF POSTOPERATIVE CARDIOPULMONARY COMPLICATIONS

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Objective: B-type natriuretic peptides (BNP) are secreted by the human heart in response to ventricular wall stretch or myocardial ischemia, and predict adverse cardiovascular events and death in the general population. Following noncardiac surgical procedures there is growing evidence supporting BNP measurement as a powerful independent predictor of death and perioperative complications. However, the clinical implication of elevated BNP measurements after pulmonary resection, has not been completely defined. This study aimed to evaluate the role of BNP in predicting adverse cardiopulmonary events after thoracic surgery.

Methods: Prospective, short-term, observational cohort study in a tertiary care hospital, including consecutive patients undergoing scheduled pulmonary resection between April 2012 and October 2013. Baseline clinical details were obtained, serum BNP levels were measured at baseline and on postoperative day 1 and 4.

Results: We enrolled 294 consecutive patients, median age 66 (IQR 57-73), 67% male. There were 2 perioperative deaths, and 52 patients experienced one or more cardiopulmonary complications. The baseline median BNP value was normal (29.5 pg/mL, IQR 16-57.2), and showed significant postoperative increase, peaking on day 1. Patients who developed postoperative complications had a significantly greater BNP increase (\( P<0.0001 \)) as compared to those without complications. A postoperative day 1 BNP measurement ≥118.5 (ROC area=0.654; 95% CI=0.57-0.74; \( P=0.001 \)) was associated with a threefold risk of developing postoperative cardiopulmonary complications (OR 2.94; 95% CI:1.32-6.57; \( P=0.008 \)). Logistic regression analysis showed major pulmonary resections (lobectomies or pneumonectomies), BNP ≥118.5, and age ≥65 to be the only independent predictive variables. In the subset of patients undergoing lobectomy or pneumonectomy (n=226) BNP was the strongest independent predictor of complications (OR 3.49; 95% CI:1.51-8.04).

Conclusions: Our results show that BNP elevation, measured in the first days after thoracic surgery, is independently associated with postoperative adverse events. In patients undergoing major pulmonary resections a postoperative BNP elevation is the strongest independent predictor of cardiopulmonary complications.

CLINICAL APPLICATION OF GALECTIN-3 IN HEART FAILURE

Rudolf A. De Boer

Galectin-3 is an emerging biomarker in heart failure and other diseases. Experimental studies have shown that galectin-3 is produced and released in the injured heart by monocytes and macrophages, and have a profound effect on scar and fibrosis formation. Galectin-3 is also
secreted into the systemic circulation and circulating galectin-3 can reliably be measured with an ELISA. It has been shown that in the general population, galectin-3 is associated with cardiovascular risk factors, and predicts mortality as well as new onset heart failure and new onset renal disease. Further, clinical studies in cohorts with patients with acute and chronic heart failure have shown that circulating galectin-3 is a strong predictor of adverse outcomes including mortality and hospitalization.

Galectin-3 may be used for various purposes in clinical heart failure. First, prognosis and risk assessment remain challenging in individual patients and galectin-3 adds incremental value in certain cohorts, independent from LVEF, eGFR and diabetes. Specifically, prediction of short-term outcomes appears to be very robust, and this may help to guide the use of limited resources such as intensified follow up programmes. Further, in more stable cohorts, changes in galectin-3 over time strongly predict outcome and may be used to monitor patients. Finally, galectin-3 may be of particular interest in specific subgroups of patients with heart failure, such as patients with heart failure with preserved ejection fraction or patients with the cardiorenal syndrome. In this presentation, recent data on the use of galectin-3 as a biomarker in heart failure are summarized.

**ANTIPLATELET TREATMENT IN THE EMERGENCY ROOM FOR NON STEMI PATIENTS**

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The term acute coronary syndrome (ACS) refers to a group of clinical symptoms compatible with acute myocardial ischemia and includes unstable angina (UA), non ST-segment elevation myocardial infarction (NSTEMI), and ST-segment elevation myocardial infarction (STEMI). Anti-thrombotic and anti-ischemic medical therapies as well as prompt revascularization are the cornerstones of management. The management of non-ST-segment myocardial infarction (NSTEMI) requires clinicians to choose amongst myriad anti-thrombotic agents for initial medical stabilization, thereby requiring them to integrate and balance risks of adverse ischemic and bleeding events. Antiplatelet therapy should be instituted as early as possible when the diagnosis of NSTE-ACS is made in order to reduce the risk of both acute ischaemic complications and recurrent atherothrombotic events.

Platelets can be inhibited by three classes of drugs, each of which has a distinct mechanism of action. Acetylsalicylic acid targets cyclooxygenase (COX-1), inhibiting thromboxane A2 formation and inducing a functional permanent inhibition in platelets. However, additional complementary platelet aggregation pathways must be inhibited to ensure effective treatment and prevention of coronary thrombosis. ADP binding to the platelet P2Y12 receptor plays an important role in platelet activation and aggregation, amplifying the initial platelet response to vascular damage. The antagonists of the P2Y12 receptor are major therapeutic tools in ACS. The prodrug thienopyridines such as clopidogrel and prasugrel are actively biotransformed into molecules that bind irreversibly to the P2Y12 receptor. A new class of drug is the pyrimidine derivative ticagrelor, which without biotransformation binds reversibly to the P2Y12 receptor, antagonizing ADP signalling and platelet activation. Prasugrel requires two metabolic steps for formation of its active metabolite, which is chemically similar to the active metabolite of clopidogrel I.v. GP IIb/IIIa receptor antagonists (abciximab, eptifibatide, and tirofiban) target the final common pathway of platelet aggregation.

The optimal platelet inhibition strategy for ACS patients managed without revascularization is unknown. Dual antiplatelet therapy (DAPT) with aspirin and a P2Y inhibitor is standard of care in acute coronary syndromes. The choice of combination of oral antiplatelet agents, a GP IIb/IIIa receptor inhibitor, and anticoagulants should be made in relation to the risk of ischaemic and bleeding events. Among patients who are already treated with DAPT, the addition of a GP IIb/IIIa receptor inhibitor for high-risk PCI (elevated troponin, visible thrombus) is recommended if the risk of bleeding is low. The FDA has approved 2 additional P2Y12 receptor inhibitors for use in patients with UA/NSTEMI. The FDA approved the use of prasugrel and ticagrelor based on data from head-to-head comparison trials with clopidogrel, in which prasugrel and ticagrelor were respectively superior to clopidogrel in reducing clinical events but at the expense of an increased risk of bleeding.

The pivotal trial for prasugrel, TRITON–TIMI, focused on patients with ACS who were referred for PCI and patients with UA/NSTEMI undergoing PCI. Prasugrel decreased cardiovascular death, MI, and stroke. Rates of cardiovascular death and nonfatal stroke were not reduced by prasugrel relative to clopidogrel. Rates of stent thrombosis were significantly reduced from 2.4% to 1.1% by prasugrel. Prasugrel was associated with a significant increase in the rate of bleeding. The FDA labeling information includes a general warning against the use of prasugrel in patients age >75 years because of concerns of an increased risk of fatal and intracranial bleeding and uncertain benefit except in high-risk situations. In focusing specifically on patients with UA/NSTEMI, the rate of the primary efficacy endpoint was significantly reduced in favor of prasugrel.

Ticagrelor as opposed to clopidogrel and prasugrel does not require enzymatic activation, and causes faster, greater, and more consistent platelet inhibition compared with clopidogrel. The PLATO trial compared ticagrelor with clopidogrel in patients with ACS. Ticagrelor was superior in preventing ischaemic events as well as death from any cause, without a significant increase in all-cause major bleeding. PLATO included both invasively and non-invasively managed patients. In focusing specifically on patients with UA/NSTEMI, ticagrelor was associated with a significant reduction in the primary efficacy endpoint among NSTEMI patients but not among UA patients although caution is urged against interpreting subgroup analyses.
DIAGNOSTIC UTILITY OF COPEPTIN IN ADDITION TO HIGH-SENSITIVITY CARDIAC TROPOIN FOR THE EARLY DIAGNOSIS OF NON-ST-ELEVATION ACUTE CORONARY SYNDROMES - THE COPACS STUDY

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Aims: Rapid and reliable exclusion of Non-ST Elevation Myocardial Infarction (NSTEMI) during an Emergency Department (ED) triage is a major unmet clinical need. We aimed at verifying the diagnostic non-inferiority of a multimarker fast-track first-draw strategy of high-sensitivity cardiac troponin I (hs-cTnI) and ultrasensitive copeptin (cop-us) compared with dual hs-cTnI sampling within 3 hours for the early diagnosis of NSTEMI versus Non Coronary Chest Pain (NCCP) in a selected cohort of consecutive patients admitted at the ED.

Methods: Cop-us and hs-cTnI levels were measured at presentation in 196 consecutive patients admitted to the ED for non-traumatic chest pain with onset within the previous 6 hours and without ST elevation on a 12-lead electrocardiogram (ECG). The comparative diagnostic performance for NSTEMI diagnosis of a combination of hs-cTnI and copeptin, hs-cTnI and CK-MB, hs-cTnI and myoglobin on admission; and of the 3 hours hs-cTnI serial sampling was studied with reference to the adjudicated post-discharge diagnosis. The diagnostic accuracy and the predictive value of the various biomarkers combinations were assessed using both a Receiver Operating Characteristic (ROC) curve and McNemar chi-squared test. A margin to define non inferiority between the areas under the ROC curves (AUC) was set at <0.05.

Results: The adjudicated final diagnosis of NSTEMI was done in 29 patients (14.8%). At the time of first blood sampling analysis on admission, a cop-us level <10 pmol/L in combination with a hs-cTnI <0.045 ng/mL safely ruled out NSTEMI with both a sensitivity and a negative predictive value of 100%. The combination of hs-cTnI and cop-us generated an area under the ROC curve (AUC) of 0.87 (95% confidence interval (CI): 0.82 to 0.91), which was non-inferior with respect to the 3-hours interval hs-cTnI serial sampling (P=0.194 for AUC difference). When compared with hs-cTnI alone on admission, the combination of hs-cTnI and copeptin yielded a significant higher diagnostic sensitivity (P<0.03). Short-term follow-up at 3 months of NCCP patients with an initial negative cop-us test was completely uneventful (out-of-hospital major adverse cardiovascular event rate 0%).

Conclusions: The combined single-sampling use of cop-us and hs-cTnI is non-inferior to dual hs-cTnI sampling to allow a rapid and reliable ruling-out of NSTEMI, and may thus obviate the need for prolonged monitoring and serial blood biomarker sampling in patients within 6 hours from chest pain onset. Diagnostic utility of cop-us results in substantial benefits for both healthcare providers and patients, cutting-down on costs of chest pain management and reducing both self-discharge and readmission rates with important ethico-legal implications.

CARDIOVASCULAR DISEASES IN ELDERLY PATIENTS: IS THERE THE NEED FOR A SPECIFIC APPROACH?

Nicola Ferrara, Giuseppe Rengo, Graziamaria Corbi, Valentina Parisi, Dario Leosco

It has well known that the incidence and prevalence of cardiovascular diseases increase with the age and, despite of development of new therapies and new preventive strategies, the cardiovascular diseases are the main cause of mortality in developed countries. In the last century, life expectancy has been remarkably increasing in the western countries, particularly in Italy, where it has reached 80 years in men and 85 in women. This demographic revolution has dramatically changed the health scenario. Population aging is associated with an increasing prevalence of chronic diseases (including cardiovascular diseases) and comorbidities (the presence of one or more diseases in addition to an index disease, potentially contributing to disability). These conditions increase the risk of death and reduce functional autonomy in the elderly and a correct clinical approach, including the comprehensive geriatric assessment, should be used in these patients. In patients with cardiovascular diseases should be considered not only the traditional functional evaluation, while the global functional assessment plays a crucial role in identifying older persons at high risk of death, of disability and frailty. Acute and chronic cardiovascular diseases may contribute to frailty, that is a geriatric syndrome due to impaired physiological reserve and is characterized by a reduced ability to cope with stressing situations and by the progressive inefficiency of homeostatic mechanisms. Frailty and cardiovascular diseases share a common biological pathway and cardiovascular conditions may facilitate the manifestation of clinical frailty. Frail patients with cardiovascular diseases, especially those undergoing invasive procedures, have a substantially higher probability of complications and adverse events when compared to robust patients.

Another important aspect of cardiovascular diseases in older people is the presence of polytherapy (multiple medications prescribed to an individual patient) and polypharmacy (multiple medications not directly prescribed by a physician), conditions associated with higher risk of adverse drug reactions with increased mortality and hospitalizations that contribute to increase direct and indirect National Health Services costs. For these reasons the care of the elderly, who is often affected by multimorbidity, disability, frailty and risk of iatrogenic damage, cannot
be confined to the evaluation and treatment of single organ diseases, but should follow a global approach. Moreover, the physicians should be instructed in strategies aimed at reducing adverse drug reactions without reducing the optimal management of acute and chronic heart diseases.

NOVEL BIOMARKERS FOR SEPTIC PATIENTS

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Sepsis is a systemic inflammatory response to infection, which represents a mayor cause of death in critically ill patients and in those admitted in medical wards. Complexity of early diagnosis and subsequent delay in prompt proper treatment reduces survival. Biomarkers have been initially suggested as diagnostic tool for discrimination between infective and non-infective conditions. More than 170 biomarkers (C-reactive protein, procalcitonin, various cytokines, and cell surface markers) are significantly increased in sepsis, compared to the control population (general population, admitted or SIRS patients). Expanding research on this field proves that none of the identified biomarkers, of their combination, of the computational algorithm is satisfactory in single determination as a guide for immediate diagnosis of sepsis.

Contemporary research in biomarkers is moving from an agnostic approach to detailed queries, in a specific setting. Novel biomarkers investigated in the recent years could be of help in diagnosis of sepsis (“omics” technologies, presepsin, CD163, IL-27, suPAR, miRNA) or organ injury (netrin-1 and KIM-1, cystatine, CD 25), survival (Lysoosphosphatidil coline, presepsin, STREM-1, suPAR, cDNA), complications, like severe sepsis or septic shock (osteopontin, suPAR), and response to treatment (procalcitonin, pro adrenomedullin, and C reactive protein). An increasing number of studies investigate biomarkers within specific conditions, like burnt patients, respiratory diseases, urinary infections, community acquired pneumonia and others.

Identification of candidate biomarkers, as genes, transcripts, proteins, metabolites, and miRNAs through new (high throughput and “omics”) technologies received much attention, leading to extensive future work to validate the proposed biomarkers. The research approach of the recent years parallels and merges with genetic analysis of candidate genes, possibly leading to new developments like personalized medicine at an affordable cost.

MicroRNAs (miRNAs), non-coding short RNA transcripts that regulate the expression of genes by degradation of specific mRNAs or repressing their translation, hold potential as diagnostic and prognostic markers and are probably the most promising frontier in biomarker research.

ABDOMINAL TRAUMA

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The liver is the organ most frequently involved in abdominal blunt trauma. The prevalence in polytrauma is 20%. The mechanism can be direct or indirect.

The most widely used classification system is that of the American Association for the surgery of Trauma (AAST).

Forse cercavi: Il fegato è l’organo addominale più frequentemente coinvolto nei traumi chiusi. La prevalenza nei politraumatizzati è del 20%.

In recent years in the management of haemodynamically stable patients hepatic trauma is characterized by a strong tendency non-surgical approach. Ultrasound FAST (Focused Assessment with Sonography for Trauma) is the first level investigation in the search for an effusion in clinically unstable patients in the course of Primary Survey.

The method is highly sensitive and specific in the search haemoperitoneum (97-100%). In 90% of cases the effusion is intraperitoneal.

In the remaining cases, ultrasound may be negative when originates from the “bare area” of liver and down on the retroperitoneum. The presence and extent haemoperitoneum is not correlated with the extent of the injury, but is relevant to the overall assessment of the damage and of the strategy.

The CT scan is the diagnostic method of choice in evaluating the patient hemodynamically stable. CT plays an important role in the selection of patients for conservative treatment, through an accurate diagnosis and staging of lesions and the assessment and quantification of emo (retro) peritoneum.

Splenetic trauma represent about 40% of all blunt trauma of the abdomen. The spleen is the most vascular organ of the body (500 ml, 5% of cardiac output), is particularly vulnerable to the texture of the parenchyma, the hypermobility, the anatomical relationships with the spine and ribs. The lesions of the spleen are sometimes isolated, but more frequently associated with trauma of the liver (left lobe), kidney and left adrenal, pancreas, pleuro- parenchymal and diaphragm.

In pediatric patients the spleen is most vulnerable because proportionally larger than the other organs.

The reduced thickness and development of the musculature of the abdominal wall and the greater flexibility of the costal arches lead to a poor dispersion of the energy frame on the chest. In blunt trauma is determined by the dynamic mechanism of acceleration / deceleration. Some predisposing conditions such as splenic infarction, chronic liver diseases, some infectious diseases or hematologic, can cause it to break spontaneously or even minor trauma. Diagnostic imaging plays an important role in the diagnosis, in determining the degree of severity, in the search for associated injuries, and possible complications. Fundamental role also in the monitoring of the lesions.

The management of splenic trauma has changed with a growing tendency towards conservative management.
The non-operative management (NOM) is considered today the “standard care” treatment in hemodynamically stable patient. This approach stems from the experience in pediatric patients in which the main objective is to preserve the immunological function of the spleen and prevent OPSI (“overwhelming post-splenectomy infections”).

Computed tomography is the method of choice due to its high sensitivity (98%) and specificity in the diagnosis, staging, search for possible associated lesions and in the evaluation of prognostic indicators fundamentals such as bleeding or active involvement of vascular structures. The ultrasound with contrast enhanced ultrasound (CEUS) is indicated in the minor trauma, monitoring of lesions, especially in young patients and pediatric patients.

The classification system of the American Association for the Surgery of Trauma distinguishes trauma in 5 stages.

Shammuganathan proposes a system of classification “CT based” which emphasizes the importance of research of the presence of an active extravasation or vascular lesion. These findings are of greater clinical significance than the classic grading of the lesions and in fact represent an indication to the choice of therapy is not conservative. Pancreatic trauma constitute 2% of the injuries resulting from blunt abdominal trauma.

The isolated trauma is rare, because in 75-90% of cases are associated with injury to other organs. In 28 to 30% with fractures of the lumbar spine. The presence of a traumatic injury in the pancreas is in fact the expression in the adult the action of a force vector at high energy. The most common mechanism of action is the compression of the gland against the spine. Typical the direct impingement of the epigastric region against the steering wheel in the road trauma in the absence of the safety belt.

In the pediatric age however, in view of the reduced thickness and poor development plans and tone muscle of the abdominal wall, pancreatic trauma can also occur as a result of impacts to low.

Important differential diagnosis with the possible trauma of the duodenum (vomiting).

The lesions generally impacting body and isthmus (about 2/3 of cases) by the action of a force vector to front orientation, the more rare the trauma of the head (30% mortality) and the tail in the case of carriers to lateral orientation. The clinical diagnosis is difficult and often delayed. The delay with which these injuries are sometimes misdiagnosed, is responsible for the onset of complications.

CT is the method of choice in the diagnosis and staging of pancreatic trauma.

MR cholangiopancreatography is the technique of choice for non-invasive imaging in the evaluation of the integrity of the duct of Wirsung. Generally, the traumatic lesions of the pancreas are classified according to the criteria AAST. The kidney is the 3rd organ involved by frequency in closed abdominal trauma adult.

In 80-90% of cases occurring in the course of renal trauma blunt trauma (MVA, MCA, Sport), while 10% occur as a result of penetrating injuries (stab, gunshot).

In 75% of cases, renal lesions are associated with involvement of other abdominal organs. Thanks to the retroperitoneal anatomical position, the 95-98% of isolates are minor injuries.

Formulate an early diagnosis is important for the selection of therapeutic treatment and prevention of complications such as bleeding, urinoma and abscesses.

CT is the gold standard for the evaluation of renal trauma. There are several classification criteria: AAST, in Mirvis (CT based), or Federle (Imaging based).

Adrenal gland trauma are rare and generally occur in more so-called high-energy trauma in association with other thoracic or abdominal injuries. The patient with trauma adrenal is generally a polytrauma with high index of severity of the trauma (ISS). Are more frequent on the right and in most cases determined by mechanisms of acceleration / deceleration with compression / decompression of the vascular system.

**ACUTE ABDOMEN**

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Acute abdominal pain may be caused by an innumerable of diagnoses, including acute appendicitis, diverticulitis, and cholecystitis. Acute abdominal pain accounts for 5-10% of visits to the emergency department. Rapid and accurate detection of urgent conditions is vital for managing patients and for efficient throughput of patients. Decision making in patients with abdominal pain on the basis of clinical and laboratory evaluation alone can result in unnecessary interventions or in delayed treatment of urgent conditions. Diagnostic imaging plays a key role in the evaluation and management of acute abdominal pain. The use of early CT in patients with abdominal pain has been shown to reduce the number of serious diagnoses missed. CT proved to be cost-effective in the setting of acute appendicitis. CT is the technique of choice for the diagnosis of acute abdominal pain, except in patients clinically suspected of having acute cholecystitis. In these cases, ultrasound (US) is the primary imaging technique of choice. When costs and ionizing radiation exposure are primary concerns, a possible strategy is to perform US as the initial technique in all patients with acute abdominal pain, with CT performed in all cases of non-diagnostic US. Given the low diagnostic yield of the conventional radiography in the evaluation of the acute abdomen, it is difficult to understand its continued application; this examination has only a possible role in the setting of bowel obstruction. However, CT is more accurate in this setting as well. In cases of bowel perforation, CT is the most sensitive technique for depicting free intraperitoneal air and is invaluable for determining the cause and the location of the perforation. Imaging is less useful in cases of bowel ischemia, although some CT signs are highly specific. Magnetic resonance (MR) imaging is a promising alternative to CT in the evaluation of acute abdominal pain and does not involve the use of ionizing radiation exposure and this is very important in pediatric and young patients and in the pregnant patients.
A FRAGILE PATIENTS IN EMERGENCY ROOM, THE CHILD WITH TEMPERATURE: IS IT POSSIBLE TO IMPROVE THE APPROACH?

Emanuele Guglielmelli

Emergent management of pediatric patients with fever is a common challenge. Children with fever account for as many as 20% of pediatric emergency department (ED) visits,[1] and the underlying disorders in these cases range from mild conditions to the most serious of bacterial and viral illnesses.[2, 3]

In 2013 at the ED of San Camillo Forlanini were visited 2954 children with fever symptom, accounting for 21.58% of all accesses. Infants younger than 2 months have unique risks for serious bacterial infections; as such, their management is discussed separately from that of older children.

Clinical guidelines have been studied, reported, and scrutinized in major journals for the past 2 decades, yet definitive conclusions are sometimes still elusive and the application to each individual case in the ED is sometimes even more frustrating for the clinician.[4] Inconsistent treatment approaches exist even in the most experienced pediatric EDs.[5, 6]

Some of the fears and anxiety exhibited by parents are shared by ED staff as well. Myths and misperceptions about children with temperature elevations are reported. Fever phobia is well described as existing with both caregivers as well as medical providers.[7, 8, 9, 10] Because pediatric fever is both a high-impact and a high-frequency chief complaint, the clinician should be knowledgeable about febrile conditions that occur in a variety of age groups of pediatric patients. ED guidelines for treating children with febrile illness are used in order to standardize the approach to care.

The child discharged, will have to go back to visit the next 12-24 hours. This presentation discusses the appropriate ED management of young febrile children.

References

TELEMEDICINE, A MEANS OF “JUST IN TIME STAFFING” DURING PERIODS OF ED OVERCROWDING

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Objectives: Emergency Department (ED) staffing is generally variable based upon observed patterns over extended periods. Ultimately on any given day patient volumes are highly unpredictable which can result in an imbalance between physician and space availability and patient numbers and demands for service. This can result in delay of care and patients leaving without care. We initiated a pilot program of emergency physician (EP) telepresence in the ED in order to provide additional physician resource just at times when most needed. The objectives of the pilot were to assess general feasibility, safety, patient and provider acceptance and patient throughput time (defined as time of arrival to left the ED).

Methods: A prospective convenience study was conducted. Patients presenting to the ED during operation of the pilot who were planned for placement in the waiting room due to ED saturation were considered for enrollment. A faculty EP was contacted and connected remotely from
various locations in order to conduct patient evaluations via telepresence. A confirmatory evaluation by the onsite faculty EP was performed prior to final disposition. Patient care was either taken to completion by the telemedicine EP or initiated and then handed off to the onsite team. Evaluative measures included patient demographics, triage class (ESI 1-5), throughput time and a single question satisfaction survey (rating 1 to 5, 5 most favorable) completed by patients, RNs and EPs. Patients were called within 3 days and the EHR reviewed at 7 days looking for unscheduled visits and adverse events.

Results: 130 patients were enrolled, 79 male, mean age 41.5 years. Mean triage class was 3.9 with a median throughput of 150 minutes (IQR = 116.5, 206). Non-telemedicine patients during the same time period with similar triage classes had a median throughput of 287 minutes (IQR=199, 408). Mean satisfaction scores were: patient 4.91, nurse 4.75, on site EP 4.47 and telemedicine EP 4.79. There was one potential misdiagnosis and no adverse events.

Conclusion: Patient evaluation by EP via telepresence is feasible, safe, readily accepted by patients and providers and associated with reduced throughput time. We plan on future studies to assess the cost effectiveness of this “just in time” ED physician staffing model.

SOLUBLE ST2 HAS A PROGNOSTIC ROLE IN CRITICALLY ILL PATIENTS WITH SUSPECTED SEPSIS

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Introduction: Soluble suppression of tumorigenicity 2 (sST2) has emerged as a novel biomarker for heart failure and can be also increased in inflammatory diseases. We explored whether sST2 is related to cardiac dysfunction/failure and has a prognostic role in critically ill patients with suspected sepsis.

Methods: In a total of 397 patients with suspected sepsis, sST2 concentrations were measured using Presage ST2 Assay (Critical Diagnostics, CA, USA). sST2 concentrations were analyzed according to procalcitonin (PCT) concentrations, cardiovascular subscores of sepsis-related organ failure assessment (SOFA) score, and clinical outcomes.

Results: sST2 concentrations were significantly different according to the five groups of PCT concentrations and cardiovascular subscores of SOFA score \( (P < 0.000001 \) and \( P = 0.036 \), respectively). In-hospital mortality was significantly different between the two groups of sST2 concentrations at cut-off of 35 ng/mL \( (P = 0.0213) \). In the four groups according to the sST2 and PCT concentrations, the highest in-hospital mortality was observed when both sST2 and PCT concentrations were increased \( (P = 0.0028) \).

Conclusions: sST2 seems to be related to both cardiac dysfunction/failure and severity in sepsis. Combined use of sST2 and PCT would be promising for the risk stratification and prognosis prediction in critically ill patients with suspected sepsis.

Keywords: sST2, Cardiac failure, Severity, Prognosis, Procalcitonin, Sepsis.

LUNG TRAUMA

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Lung is frequently involved in Major Trauma; these presentation concern about indications and limits of the principle diagnostic imaging (Chest XR, Lung Ultrasound, CT) in the diagnosis of the different lesions that occur in these setting.

We will show the aspects of pneumothorax, hemothorax, contusions, pneumatocele, hematocele, atelectasis and active bleeding.

HIGH SENSITIVE TROTONIN IN THE EMERGENCY ROOM: NO ROOM FOR MISTAKES SO WE WILL MAKE SURE IT IS DONE PROPERLY

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High sensitivity cardiac troponin assay will markedly improve the ability to monitor chronic disease and will facilitate our ability to triage patients with possible ACS in the Emergency Department (ED). Unfortunately, as with many fields, when innovations are proposed, they are
often implemented with less than ideal data which at times can lead to more dysfunction than improvement. This has in the opinion of this researcher been the case for hsTn in the ED. Some principles are key:
1. There will be many more elevations observed. The majority of the increase will not be in patients with possible ACS but in patients with other diseases such as heart failure and other medical conditions who have cardiovascular comorbidities.
2. There will very likely be different approaches that will help in ruling in and ruling out AMI.
3. Defining the pre-test likelihood of ACS will be critical.
4. It is likely that very low values of hsTn will allow for ruling out a subset of patients with possible ACS (the low risk subset) on the first sample. The studies that have used this strategy have left major gaps that will be discussed but eventually this approach will likely succeed. It should be clear that it will require individual metrics for each hsTn assay.
5. How applicable this strategy is for very early presenters is unclear.
6. Ruling in will also be markedly facilitated by observing a rising and/or falling pattern of values and in general most but not 100% of patients will rule in within 3 hours.
7. Although for most ACS patients, a marked change in values will be observed, those that present late may not have a changing pattern and there will be some patients with only modest change that will be difficult to triage definitively.
8. Most studies have major gaps that should be understood and will be discussed.

**INNOVATIVE PHARMACOLOGICAL TREATMENT FOR ACUTE ATRIAL FIBRILLATION IN ED: EXPERIENCE WITH VERNAKALANT**

Steen Juul-Möller

**Clinical setting:** Time matters when it comes to cardioversion of newly developed Atrial Fibrillation. The shorter duration of the actual attack, the better outcome for cardioversion (1,2) and the lower risk of subsequent cerebral ischemia including ischemic stroke and TIA. Cardioversion performed < 12 hours since start of actual AF attack implies a follow-up risk of stroke of 0.3%, while this risk is 1.1% (P<0.004) if the duration is 12-48 hours (3).

Also, the RhythmAF survey has demonstrated that amiodarone is the most frequently used cardioverting drug, even if the efficacy does not differ from placebo or betablockers and thus is very slow (24 hours) (4).

The fastest cardioverting drug today is vernakalant (Brinavess™), with a median time to cardioversion of 11 minutes, and the efficacy in randomized trials is > 60%, in patients with AF attack duration < 24 hours. The efficacy is 70% in real world registries (5). Electrical cardioversion requires fasting, and in most cases support from anestesiologist (67% in the RHYTHM-AF study). The time needed for electrical cardioversion was – in the same registry – 6 hours (2.4-40 hours) (4).

**The Malmö cohort and other Real World results:** Brinavess™ has been used at the Emergency Department at the Skåne University Hospital in Malmö, Sweden, since 2011. A follow-up registry demonstrates a Brinavess™ cardioversion efficacy between 64% (in men) and 76% (in AF<10 hours). Mean efficacy was 70%, within (median) 11 minutes (5). The relative number of Brinavess™ cardioversion versus electrical cardioversion has increased from 13% in 2011 to 50% in 2014 in Malmö, Sweden.

Other “Real World” registries have demonstrated an even higher Brinavess™ cardioversion efficacy, 86-93% (6,7).

**Conclusion:** In order to achieve maximal cardioversion efficacy it is important to cardiovert the patient in the Emergency Room and without delay. In order to reduce the risk of subsequent ischemic stroke the same requirements are valid: Fast cardioversion without delay! The only modality today that offers fast and safe cardioversion is Brinavess™ treatment in the Emergency Room.

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**EXPERIENCE WITH BIVA IN AHF**

Irene Lalle, Salvatore Di Somma

Acute heart failure (AHF) is the most common single cause of hospitalization for patients >65 years, accounting for about 2% of all hospitalizations as principal diagnosis and for 4% when listed with other conditions. The inhospital mortality of AHF varies from 4% to 8%. Follow-up after the hospitalization is characterized by a high incidence of death (8%-15% at 2-3 months) and rehospitalizations (30%-38% at 3 months).
Although the rate of deaths and hospitalizations seems to have reached its peak in the last few years, there is still a continuous increase in the number of AHF episodes because of aging of the population and improvement in cardiovascular care. As over 80% of HF admissions and readmissions originate in the ED, the emergency physician serves a very important role in management and right placement of patients with AHF. Recent literature shows much interest in identifying early clinical predictors of outcome in these subjects. In fact, earlier treatment in patients with a high severity of illness is associated with a decreased mortality.

More recently bio-impedance vector analysis (BIVA) has been suggested as a tool to highlighting congestion in AHF patients with altered body fluid mass due to neurohormonal abnormalities. Indeed BIVA is able to differentiate cardiac and non cardiac dyspnea in emergency department, to quantify peripheral congestion and to detect peripheral congestion, even when it is not clinically remarkable yet. In the last years, our experience with BIVA and biomarkers in evaluating acute heart failure patients progressively increased and led to interesting results.

In a previous study published in 2010, we evaluated hydration status at the admission, 24, 72 hours after admission and at the discharge in AHF patients, with a multidimensional approach, using BIVA, BNP, Cavai Index and vascular pedicle width obtained through chest X-ray. Our results confirmed the strong correlation between hyperhydration demonstrated by BIVA and central venous congestion and between hyperhydration and oliguria. From our data it is possible to conclude that the BIVA measurements are strictly related with the other three methods. Hydration Index obtained by BIVA and Cavai Index showed a significant and indirectly proportional correlation at the time of ED presentation and 24 and 72 hours after hospital admission, and moreover the BIVA values’ shift from an hyperhydrated state to a normal hydrated state related with the improvement due to diuretic treatment in AHF patients. Furthermore, the efficacy of diuretic therapy and the validity of BIVA measurements were bedside confirmed by normalization of BNP, vascular pedicle width and caval index values at discharge. Recently we assessed BIVA measurement in AHF patients at the moment of their admission in ED to evaluate its diagnostic and 30-days prognostic role. It seems that Hydration Index (HI) obtained by BIVA, added to BNP measurements, provides an improvement in patients’ reassessment for the diagnosis and risk stratification, especially for those patients with a BNP values between 100-400 pg/ml (“grey zone”) (Net reclassification improvement, NRI 77% for diagnosis and NRI 65% for prognosis).

Furthermore we found a significant vector migration, from admission to discharge, in hospitalized AHF patients. This suggests a greater reduction of congestion during hospitalization and it is probably linked to cardiac function improvement and diuretic therapy.

Conclusions: A quantitative evaluation of body fluid congestive status performed in AHF patients by HI through BIVA, obtained at admission in ED, provides significant additive diagnostic and 30-day prognostic information to BNP, particularly in the “grey zone”. Moreover, BIVA serial assessment could provide important information on treatment efficacy and patients effective response to therapy in patients with shortness of breath due to AHF.

References

THE ALLIANCE BETWEEN SCIENTIFIC SOCIETIES AND SUDDEN DEATH

Pietro Lentini

Despite the significant decline in coronary artery disease (CAD) mortality in the second half of the 20th century, sudden cardiac death continues to claim 250 000 to 300 000 US lives annually. In Europe and North America the annual incidence of SCD ranges between 50 to 100 per 100 000 in the general population.

Some people may experience a racing heartbeat or they may feel dizzy for a few seconds or minutes before passing out, alerting them that a potentially dangerous heart rhythm problem has started. In over half of the cases, however, sudden cardiac death occurs without prior symptoms.

Sudden cardiac death can be treated and reversed, but emergency action must take place immediately, since brain death and permanent death start to occur in just four to six minutes after someone experiences cardiac arrest. Emergency treatment includes cardiopulmonary resuscitation (CPR) and defibrillation. CPR is a manual technique using repetitive pressing to the chest and breathing into the person’s airways that keeps enough oxygen and blood flowing to the brain until the normal heart rhythm is restored with an electric shock to the chest, a procedure called defibrillation. Emergency squads use portable defibrillators and frequently there are public access defibrillators (AEDs, ambulatory external defibrillators) in public locations such as airports that are intended to be available for use by citizens who observe cardiac arrest. If there is an ambulatory external defibrillator available, the best chance of rescuing the person includes defibrillation with that device. The shorter the time until defibrillation, the greater the chance the person will survive. It is CPR plus defibrillation that saves a person.

There are currently many scientific societies involved in the prevention of sudden death which are characterized by their commitment to scientific, social or territorial but especially for members who choose to adhere to a scientific societies and organizations rather than another. Working together is important because the spread of the message must be transmitted widely among doctors, nurses but also among the laity. This is the real spirit of PAD (Public Access Defibrillation) projects.
ACSa in recent years has made a deep and mature integration with other associations. Continuing education program it covers many areas of interest with particular emphasis on the dissemination of a culture of prevention of sudden death. Since several years we collaborate with the 'ACE (Advanced Cardiac Electrophysiology) which in recent years has found place in the splendid setting of Palazzo Colonna, bringing together cardiologists from all over Italy’s on the subject of sudden death. We carried out a training program with the SIMEU Calabria. For years we’ve been participating in “Vibo Emergency”. We are active with SIMEU Campaign “a message not to die” turned over to the doctors that even lay people (volunteers, charities etc) and with an intense emotional power that we sent in all of Italy. Always busy for the past many years is the partnership with the GIEC (Group for intervention in cardiac emergencies). And the deep integration with the Great, the international scientific network organized by prof. Salvatore Di Somma. Every year ACSA offers and deals in Great new topics in emergency medicine, making Great spread effects of international scientific researches in all national territory.

INNOVATION ON EDUCATION AND RESEARCH. THE POSTGRADUATE SCHOOL IN EMERGENCY MEDICINE. THE UK EXPERIENCE

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The postgraduate schools of medicine in the UK take responsibility for doctors two years after they have qualified and completed their Foundation Programme. The EM schools oversee three stages of professional development and learning. Stage 1 = A 2 year programme in which the trainee gains experience of acute medicine, emergency medicine, anaesthesia and intensive care. Stage 2 = A one year programme of adult and paediatric emergency medicine. At this point the trainee must pass the Membership of the College of Emergency Medicine examination. Stage 3 = A three year programme working in three different emergency departments. At the end of this period the trainee must pass the Fellowship examination of the College. This Fellowship is an ‘exit’ examination and leads to entry onto the specialist register of the General Medical Council. The examination is comprised of 5 separate parts.
1. A written paper of 20 short answer questions.
2. A clinical examination of 16 real or simulated cases.
3. A written assessment of critical appraisal skills.
4. A written viva voce examination on a research question relating to the practice of emergency medicine of the trainees choosing.
5. A viva voce examination assessing the candidates knowledge of relevant law, employment practices, and non-clinical challenges associated with leading an emergency department.

Research methodologies and participation in EM research is encouraged and supported.

HOW TO IMMEDIATELY DETECT STRUCTURAL HEART DISEASE IN PATIENTS WITH ACUTE ATRIAL FIBRILLATION IN THE ED

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This session will focus on the key decision making processes required of the emergency physician to enable patients with acute Atrial Fibrillation, so that they may be managed both safely and effectively in the emergency department. Structural heart disease may be obvious in patients with a pre-existing diagnosis, certain ECG and CXR signs or clinical features but it may be masked or occult. The EM physician must be alert to the potential risks of both structural and ischaemic heart disease. Key issues explored include.
1. When is cardioversion safe and unsafe.
2. When is pharmacological cardioversion preferable to DC cardioversion.
3. When is DC cardioversion preferable to pharmacological cardioversion.
4. What drug combinations are potentially dangerous.
At present, the average age of patients admitted to an intensive Cardiac Care Unit (CCU) for an ST-segment elevation myocardial infarction (STEMI) is around 70 years, while patients with N-STEMI are on average well above 70 years of age. Therefore, patients older than 75 years represent about 35-40% of those arriving to an emergency department of a tertiary hospital for an acute coronary syndrome (ACS), and they are at greater risk of death, complications and chronic heart failure after eventual discharge.

On January 4, 2012, the Economist Intelligence Unit posted online the results of an interview of over 1100 general practitioners randomly selected across the European Union (1): 80% of them agreed that, given the current standard of care of older patients, they were concerned about how they would be treated by the healthcare system when they would be older (1,2); and 51% acknowledged that patients in their countries’ healthcare systems are less likely to have their complaints given full attention than younger ones (1). Most survey respondents also said that negative attitudes towards older people constitute the leading barrier to the provision of better care to this segment of the populations, and that a huge problem across European healthcare systems is represented by ageism: an attitude that discriminates, separates, stigmatizes, or otherwise disadvantages older adults on the basis of their chronologic age (3).

Therefore, we might wonder whether, in an acute cardiac care setting: 1) older persons with ACS are discriminated, i.e. they are not offered the best available treatment, and 2) the denial (if any) of best treatment to older persons may be justifiable because of therapeutic futility. To answer these questions, our research group set up a two-wave registry of ACS in the Florence (Italy) health district (AMI-Florence Registry) in years 2001 and 2009. The first registry included, in a population-based perspective, only cases with STEMI (4), while the second registry enrolled all clinical subtypes of ACS. Results from the first registry demonstrated that older patients were less likely to be referred to the tertiary care academic hospital equipped with facilities and 24-hours organization for primary percutaneous coronary intervention (PCI), and also were less likely to receive coronary reperfusion therapy with primary PCI. At multivariable analysis, advanced age and chronic comorbidity prior to STEMI were the two most powerful independent negative predictors of receiving coronary reperfusion (5). However, analysis stratified for chronic comorbidity levels showed that 1-year mortality reduction with primary PCI was lowest in those who were younger and with less comorbidity, but highest in those who were older and with more comorbidity (6). More recently, when we analyzed the long-term follow-up data of that registry, we found that the number-needed-to-treat (NNT) to save one life with PCI at 1, 3 and 5 years of follow-up was largely and constantly lower in patients older, compared to those younger than 75 years (7).

In the second registry (8) we performed stratified, multivariable analyses where we confirmed that patients older than 75 years are less likely to receive PCI during either STEMI or N-STEMI, when in fact the benefit (i.e. the reduction in 1-year mortality) from aggressive management of either type of ACS is greatest among those who are older and more clinically complex because of comorbidity, even adjusting for contraindications to invasive procedures with administration of contrast medium (such as chronic renal failure).

In summary, all these data suggest that older, comorbid patients with ACS frequently are denied the best available treatment, and that such a discrimination occurs across all steps of the emergency care; data also suggest that therapeutic discrimination of older cardiac patients is not only questionable in terms of medical ethics and equity, but also poorly justifiable in a clinical perspective, as benefits from best available treatment are in fact greater in older, comorbid patients.

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Noninvasive ventilation (NIV) refers to the delivery of positive intrathoracic pressure using techniques that do not need an endotracheal airway. NIV essentially requires a source of air to produce pressure, tubes to transmit the flow and an interface. There are different interfaces: masks (nasal, oronasal or total face), helmets, mouthpieces and nasal pillows or cannulas.

In clinical practice there are essentially two main modalities of NIV: Continuous positive airway pressure (CPAP) and bilevel pressure support ventilation (NIPSV). While NIPSV is a modality that requires some expertise and a ventilator, CPAP is a simple technique that may be also applied just with a source of air or oxygen. This particularity allows CPAP to be used in low equipped scenarios such as the pre-hospital setting. However, several new techniques have been recently introduced into the market, providing some technological innovations: Proportional assist ventilation (PAV) provides an inspiratory support proportional to the patient’s effort by analyzing the elasticity and resistance; High-flow nasal cannula (HFNC) used as low nasal CPAP mode for prolonged periods in patients with mild to moderate hypoxic acute respiratory failure (ARF); Average volume-assured pressure support (AVAPS) changes pressure support to deliver a target volume; Neurally adjusted ventilator assist (NAVA) synchronizes pressure delivery to the electrical diaphragm activity through a nasogastric catheter; Adaptive servoventilation (ASV) changes the expiratory and inspiratory pressure according the respiratory pattern of the patient, being currently used in complex sleep apnea-hypopnea syndromes.

Although initially NIV was mainly indicated in chronic patients at home, the use of NIV in acute settings has increased worldwide in the past 20 years and it is currently used in different scenarios like ICU, ED, hospital wards, pediatrics and pre-hospital setting. This has been associated to a decrease in nosocomial infections.

NIV reduces the intubation rate and improves more rapidly the ARF than conventional oxygen therapy in the majority of clinical settings. There is some evidence that NIV may decrease the mortality rate in COPD exacerbations, in acute cardiogenic pulmonary edema, in COPD patients with pneumonia or during weaning and in immunocompromised patients with lung infiltrates. Indeed, NIV is useful to facilitate weaning, to prevent postextubation ARF, in do not intubate patients, in asthma and in some post-operative settings.

The appropriate selection of patients, early initiation (often pre-hospital), close monitoring and asynchrony supervision, warrant the success of the technique.

Biomarkers of Acute Kidney Injury: An Update

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Acute Kidney Injury (AKI) is a frequent occurrence in a variety of clinical settings, ranging from hypotension/shock to major surgery, sepsis or drug toxicity. Aging, pre-existing renal impairment, and atherosclerosis are cofactors amplifying the risk of developing AKI, most often due to Acute Tubular Necrosis (ATN). The search for reliable markers of AKI/ATN has dominated renal research over the past 15 years, with some 1800 papers published, peaking in 2012 with 256. A host of molecules have been identified, which share sufficient degrees of sensitivity and specificity for signalling tubular injury prior to the elevation of serum creatinine or the onset of oliguria. The belief that biomarkers similar to troponins, myoglobin, CPK-MB or pre-pro-BNP in cardiac ischemia/dysfunction could be identified in the urine or plasma of patients at risk for AKI has led to the selection of a panel of molecules. They include urinary cystatin C, neutrophil gelatinase-associated lipocalin (NGAL), Kidney Injury Molecule – 1 (KIM-1), Sodium/Hydrogen exchanger 3 (NHE3), Fatty Acid Binding Protein – 1 (A-FABP), interleukin 18, N-acetil-β-D-glucosaminidase (NAG), Matrix Metalloproteinase -9 (MMP-9).

In the present review, the advantages and limitations of these biomarkers will be addressed, keeping in mind that no single molecule has yet reached the status of a reference reporter of tubular impairment, so that clinical scores of AKI such as the RIFLE or AKIN criteria could incorporate its plasma or urinary measurement as an index of severity and/or prognosis of kidney injury. At present, the clinician is still relying on classic tools such as the glomerular filtration rate, urine output, or renal biopsy, hoping to be able to exploit soon such proteomics tools in the diagnosis and early treatment of AKI.

Is Echo Assessment Enough Accurate in Determining Circulating Volume in HF Patients

Alexandru Nechita, M.D.Ph.D.

In any critical condition including HF therapy therapeutical decisions are of better quality if we are taking into account total circulating volume than intravascular volume. The golden standard is the radioisotopic method but this is not a practical approach for most of the
patients. Thus surrogate indicators have often been used. The bioimpedance method BIVA is the most accurate and it has been demonstrated to have both immediate therapeutic and also prognostic value. Right ventricular end diastolic volume index (RVEDVI) and BNP were not associated with intravascular volume status, although they may reflect increased cardiac preload. In another study clinical decision based on RVEDVI did not showed benefit excepting those with increased intraabdominal pressure (increased PCWP, decreased preload). Echo parameters useful in evaluating the circulating volume are: LVEDV, LVESV, E/E’ ratio, strain rate parameters, mitral regurgitation, pulmonary veins flow profile, IVT aortic, for the left circulation, and for the right and systemic circulation: the RVEDVI, RVESVI, TR velocity flow, right ventricle strain parameters. This parameters should be judged in conjunction with myocardial thickness and calve lesions, but there is no echo parameter or group of parameters to give us an enough accurate result in determining circulating volume in HF patients.

ATRIAL FIBRILLATION FROM THE ER TO TERRITORIAL MANAGEMENT

Alexandru Nechita, M.D., PhD

Atrial fibrillation (AF) is a common condition, especially in the elderly. The main risk for these patients is cardioembolism, it has been addressed by a large body of evidence in the literature and our current guidelines. The AF patients in the ER are a very complex population which was analysed in this study. This population is heterogeneous: the simplest cases are those of lone AF, at the opposite side we have complex patients with severe cardiac dysfunction and other comorbidities. In patients within the therapeutic window immediate cardioversion is the first choice, while in those with late presentations we prefer anticoagulation and rhythm control. A special category is that of the patients associating AF with acute heart failure, usually chronic decompensated. These patients are usually admitted to the hospital and have the highest risk of bad outcomes, both on short and long term. The echo assessment of these patients shows a large number of structural and functional cardiac abnormalities, especially cardiomyopathies and valvular disease. The in–hospital outcome of these patients is analysed. The majority of the patients with undocumented AF recognized symptoms of AF since at least 3 months, which were neglected by the patients. Only 47% of the patients with known AF were under anticoagulant therapy. From those under therapy 92% were given acenocoumarol. 56% were within a correct therapeutic INR range. At the opposite side were the patients admitted for haemorragic events due to excessive anticoagulation, an important number being surgical emergencies. After discharge (from the ER or from the hospital) the patients are referred to the GP, and also monitored in the clinic. The GP’s from the hospital referral area were asked to identify the patients with new onset AF and refer them to our clinic, through this experimental programme we discovered an important number of cardiac and vascular pathologies. AF is a marker or high risk in a cardiovascular patient and efforts should be made to build local networks for the identification and management of AF including: ER, GP’s and cardiologists.

ACUTE CONFUSIONAL STATE IN THE ELDERLY

Claire G Nicholl
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As the population ages, more frail older people are seen in the Emergency Departments of European hospitals. In advanced age, presentation of illness is often non-specific and acute confusion may indicate a wide range of conditions. Predisposing and precipitating factors for acute confusion will be discussed. Infections are a common cause, but urosepsis is over-diagnosed and rare infections may be missed. The environment is also important. The first step in the management of acute confusion is its recognition and the system that has been set up in England to improve the diagnosis of acute confusion and underlying dementia in the acute setting will be discussed. The ‘4AT’ (Bellelli et al) needs further validation but may prove useful. Management of older patients requires ‘Comprehensive Geriatric Assessment’ and elements of this may be possible in the setting of the Emergency Department.

HEMODYNAMIC ASSESSMENT IN PATIENTS WITH SEPSIS: DO WE NEED IT

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Severe sepsis and septic shock are a growing cause of mortality among hospitalized patients. While early recognition of sepsis and thus timely antibiotic therapy and fluid administration have improved outcomes about 22% of patients admitted to hospital wards develop severe sepsis or septic shock within the first 72 hours after admission and about 20% of patients treated with EGDT protocols still die. This presentation will discuss the feasibility and potential therapeutic usefulness of Emergency Department noninvasive hemodynamic monitoring in patients with sepsis. Septic patient have quite different underlying hemodynamic profiles that are currently not recognized clinically and that when these are appropriately used to guide therapy we can expect improvement in morbidity and mortality.
THE HISTORY OF EMERGENCY MEDICINE IN THE US

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Emergency Medicine as an independent specialty of medicine first developed in the USA. This development stated in 1961 and this presentation will document the reasons for its start and its progression since to its current state. Emergency Medicine began because of patient demand for expert care in the Emergency Department in the community hospitals and then training programs, clinical research and eventual academic acceptance followed.

NEW ANTICOAGULANT TREATMENT IN ATRIAL FIBRILLATION

Francesco Orzi
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Atrial Fibrillation (AF) is associated with 4-5 fold-increased risk of stroke. Major factors affecting the risk include age, previous stroke, female gender and other known cerebrovascular risk factors. For more than two decades warfarin has been known for being effective in preventing ischemic strokes in high risk AF patients [Arch Intern Med. 1994;154:2254]. Quite an effort has been devoted in the last few years to define subgroups of low risk AF patients, who may still benefit from high-quality (INR 2-3) anticoagulation control by vitamin K antagonists.

At the present novel oral anticoagulants provide physicians with the opportunity for similar (or better) effectiveness to the vitamin K antagonists, and improved convenience. The new anticoagulants fall into two drug classes: direct thrombin inhibitors (eg, dabigatran), and oral factor Xa inhibitors (eg, rivaroxaban, apixaban, and, most recently, edoxaban). All these drugs have been extensively investigated in large trials and proved to be safe and effective. According to a recent meta-analysis (Ruff et al, 2014), compared to warfarin, high-dose regimens of these drugs significantly reduce stroke or systemic embolism events by 19% (RR 0.81, 95% CI 0.73-0.91; p<0.0001).

All the trials included warfarin patients with low median time in therapeutic range. Such a potential limitation should be taken into account in the interpretation of the results. The cost/effectiveness ratio of the new anticoagulants remains, therefore, to be defined in comparisons to optimal (high time in therapeutic range) vitamin K antagonist treatment. However, it is an established observation that the new anticoagulants reduce the bleeding risk.

A major dilemma of clinical management is to evaluate the cost/effectiveness of the new anticoagulants and choose among them in newly diagnosed non-anticoagulated patients with AF who would do well on vitamin K antagonists with high time in therapeutic range.

THE CONCEPTION OF AN IDEAL RECIPIENT OF DONORS HEART

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When formulating the conception of an ideal recipient of donor’s heart for practical aspect of cardiac surgery a large number of recipient-linked factors can play a determinant role in prognosis of heart transplant (HT). In Republic of Belarus 142 HT has been performed, 40% are patients with ischemic cardiomyopathy (ICMP). Hospital mortality rate is 11%.

The aim: to determine the recipient-linked factors for successful prognosis of orthotopic HT in patients with ICMP.

Materials & methods: The group of 30 recipients with ICMP has been evaluated in perfect research. The first group was composed with 23 recipients with ICMP, surviving the HT. The second group was composed with 7 recipients with ICMP, who died during the hospital period after HT. The transthoracic echocardiography data (TTE), Swan-ganz catheterization of pulmonary artery (KPA) data, spiroveloergometry (SVE) data, NT-proBNP level, Hb1c level were evaluated.

The results: According to the results of TTE ejection fraction of right ventricle & left ventricle before the surgery has been significantly lower in the group №2 & were 32,4±2,2% (p<0,001) и 22,2±2,8% (p<0,03) respectively. Wood index has been significantly higher in the group №2 & were 8,±1,2 ml/kg/min (p<0,01). According to the results of SVE VO2 peak in the group №2 has been significantly lower in comparison with group №1 & were 1347,8 & 1268,4 ng/ml respectively (p<0,01). The level of NT-proBNP has been significantly lower in comparison with group №2 & were 1347,8 & 2682,4 ng/ml respectively (p<0,01). The level of Hb1c has been also significantly lower in the group №1 & were 5,1±1,7 ng/ml (p<0,04). Previous splenectomy had an extremely adverse effect on outcome of heart transplant.

The formula of successful heart transplant is dynamic & individual for every couple of «donor-recipient» but the basic values of this formula are constant.
RULE OUT/RULE IN OF ACUTE CORONARY SYNDROME IN THE EMERGENCY ROOM

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Each year 10.5 million patients present to US emergency departments with symptoms consistent for an Acute Coronary Syndrome. Only a very small minority, estimated at 2%, will suffer an ST segment elevation MI. The remaining 98% will then require some type of biomarker testing for risk stratification purposes. As the capability of troponin assays have increased in low level detection ability, the number of patients with detectable levels has skyrocketed. And while some consider non-AMI troponin elevations to be “false positives”, they are quite simply wrong. All troponin elevations above the 99th percentile for a normal population are associated with increased risk of short term death; and death is NEVER a false positive. Thus the detection of elevated troponin has important ramifications for the emergency physician to assist in identification of those patients with potentially increased risk of short term adverse event and therefore provide the opportunity to intervene with therapies to mitigate this risk. Currently, troponin assays with increased range to detect the lowest levels have been demonstrated to identify cohorts of patients for whom serial measurements using less sensitive assays cannot, but gender must be considered when using these assays. Furthermore, the time required for serial measures to identify patients at high risk has also been decreased to as little as zero and 1 hour after arrival. Thus, while this provides marked improvement in emergency department operational efficiency, time of presentation relative to symptom onset must be considered as very early presentations may not demonstrate the same sensitivity as reported in large investigations. Ultimately, these new assays offer the opportunity for markedly improved accuracy in the risk stratification process in patients presenting to the emergency department with suspected acute coronary syndromes.

ROLE OF FAELECTIN 3 IN DIABETES

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Galectin-3 has been increasingly recognized as an important modulator of several biological functions and an emerging player in numerous disease conditions, including diabetes and its complications. In fact, it serves as a receptor for the advanced glycation endproducts (AGEs) and advanced lipoxidation endproducts (ALEs), which are produced to an increased extent in target organs of complications, such as the kidney and vessels; where the absence of galectin-3 impairs their removal, thus leading to accelerated damage. In contrast, in the liver, AGE/ALE tissue content and injury are decreased, because the lack of galectin-3 results in reduced uptake and tissue accumulation of these by-products and, hence, attenuated damage. Some of these effects can be also explained by changes in the expression of receptor for AGEs (RAGE), associated with galectin-3 deletion and consequent changes in AGE/ALE tissues levels. In addition, galectin-3 might exert AGE/ ALE- and RAGE-independent effects, favoring resolution of inflammation and modulating fibrogenesis and ectopic osteogenesis. In fact, it was shown to promote T-cell apoptosis, to negatively regulate T cell receptor-mediated T-cell activation, and to drive alternative macrophage (M2) activation. Moreover, galectin-3 mediates TGF-β1-induced epithelial-mesenchimal transition and transdifferentiation of stellate cells into collagen-producing myofibroblasts as well as of vascular smooth muscle cells into osteoblast-like cells. Therefore, galectin-3 seems to exert a protective role in vascular complications of diabetes by dampening inflammation and favoring tissue repair. Recently, galectin-3 has been implicated also in the development of metabolic disorders such as obesity and type 2 diabetes, because it favors glucose homeostasis and prevents the deleterious activation of adaptive and innate immune response to obesogenic/diabetogenic stimuli. In addition to its immunomodulatory properties, other as yet unknown actions of galectin-3 might be involved in the regulation of adipose tissue and β-cell function. Altogether, these data indicate that galectin-3 is an emerging all-out player in metabolic disorders and their complications which is worthy of further investigation as a target of therapeutic relevance.

ELDERLY PATIENTS IN THE EMERGENCY ROOM: BE PREPARED FOR A TSUNAMI OF OVER 75s IN THE NEXT YEARS

Giovanni Pulignano, M.D.

Acute Heart failure (AHF) represents a significant and growing health care burden. Due to the ageing of population, the mean age is 75 years and patients aged >70 are 60%. So it is not surprising that AHF should be one of the most frequent syndrome for attending emergency departments (EDs) and the dominant cause of hospitalization in elderly patients. More than 80% of HF admissions are through ED and only few are scheduled, so EDs have an especially important contribution to make on this issue.
Complexity and Heterogeneity characterizes older patients with AHF in terms of mode of presentation, pathophysiology, and prognosis. Irrespective of the underlying cause (e.g., ischemic event) or precipitant (e.g., severe hypertension), pulmonary and systemic congestion due to elevated ventricular filling pressures with or without a decrease in cardiac output, is a nearly universal finding in AHF. In the older patient symptoms (e.g. dyspnoea) may be difficult to interpret, and fatigue, confusion and somnolence are frequent. Cardiac comorbidities such as CAD, hypertension, valvular heart disease, and/or atrial fibrillation, as well as noncardiac conditions such as renal dysfunction, diabetes, anemia, and medications (i.e., nonsteroidal anti-inflammatory drugs, glitazones) may contribute to the clinical presentation. Approximately 50% of AHF patients have a relatively preserved systolic function. They are older and more likely to be female. They are also more likely to have a history of hypertension and atrial arrhythmias, and present with severe hypertension.

In the early phase in the ED, after stabilization/treatment of life-threatening conditions, improving hemodynamics and symptoms are key goals. Intravenous loop diuretics with or without vasoactive agents (inotropes and/or vasodilators) improve symptoms in most patients. However, IV inotropes and vasodilators may have potential deleterious effects on the myocardium and kidney and adversely affect post-discharge outcomes. Despite available pharmacologic and non-pharmacologic treatments, early post-discharge rehospitalization and mortality rates continue to be high.

Factors associated with greater risk include very advanced age, male gender, low blood pressure at admission, diminished left ventricular function, kidney dysfunction and anemia, hyponatremia, and raised glycemia or elevated biomarkers (troponin, elevated natriuretic peptides, ST2).

Worsening signs and symptoms, neurohormonal, and renal abnormalities occurring soon after discharge may contribute to high post-discharge event rates. Currently available assessment modalities combined with recent advances in cardiovascular therapies provide present-day opportunities to improve post-discharge outcomes.

However, in the ED it is not as easy to identify high risk patients. In part, this may be due to the frequently substantial pressure on ED professionals to attend patients, leading them to opt for the most direct medical action possible and omit whatever is not indispensable for diagnosis and treatment. Moreover, patient frailty, cognitive dysfunction and disability are issues that have been given little consideration to date and are rarely quantified in ED despite their influence on prognosis.

THORACIC AORTIC INJURY

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Blunt injuries of the thoracic aorta (ATAI) are met in 0.5-2% of chest trauma patients admitted in Emergency Hospitals. ATAI are highly lethal, with 80% to 85% of patients dying at the scene of injury. Of those who survive, prognosis is still poor, with a 30% mortality rate within the first 6 hours and a 40% to 50% mortality rate within the first 24 hours after injury. This high mortality rate emphasize the necessity of rapid diagnosis and immediate primary surgery or interposition graft repair. The postulated mechanism of ATAI include shear forces caused by relative mobility of a portion of the vessel adjacent to a fixed portion, compression of the aorta between bony structures and profound intraluminal hypertension of its lumen during the severe traumatic event. Rapid deceleration in the antero-posterior and lateral directions has been shown to be sufficient to determine cardiac displacement, resulting in torsion and shearing forces against the aorta at levels of relative immobility, mainly the ligamentum arteriosum, aortic root and diaphragm. The most common portion of the aorta to be affected by the traumatic lesion, is the proximal descending thoracic segment in the site of the ligamentum arteriosum.

The radiological evaluation of acute aortic injuries has undergone radical change over the past decade, mostly due to the advent of Multidetector CT. Nowadays CT has gained an important role in screening and diagnosis of ATAI, such that CT has been considered the diagnostic tool of choice for the traumatic aortic injury.

The extent and morphology of aortic injuries vary from intimal hemorrhage to complete transaction of the wall. Direct signs of ATAI at CT scan are based on the presence or absence of aortic external contour abnormality and are defined as a change in the symmetric, round shape of the aorta. The CT signs are represented by:

- intimal tear: absence of aortic external contour abnormality and intimal defect and/or thrombus of < 10 mm in length or width;
- large intimal flap: absence of aortic external contour abnormality and intimal defect and/or thrombus of > 10 mm in length or width;
- pseudoaneurysm: presence of aortic external contour abnormality and contained rupture;
- rupture: presence of aortic external contour abnormality and free contrast extravasation inside the mediastinum or hemothorax.

Indirect signs of ATAI generally consist of the presence of mediastinal hematoma that could also be caused by the bleeding of aortic vasa-vorosorum. Blood within the mediastinum could be also determined by the rupture of small mediastinum veins immediately adjacent to the aorta, internal mammarian arteries and arch branch vessels.

In the last decade endovascular repair of ATAI has replaced open repair in many Trauma Centers. The adoption of endovascular stent grafts has resulted in a reduction in perioperative mortality, stroke and paraplegia compared with open repair. The information given by CT are very helpful for establishing the type and the position of the endovascular prothesis.
MULTICENTRE ITALIAN ANALYSIS ON CARDIOVASCULAR DISEASES IMPACT OF IMMIGRANTS REFERRAL TO EMERGENCY DEPARTMENT

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During recent years, immigration in Italy increased. There are few data on the health status of immigrants and there is need to improve their health care. Cardiovascular disorders account for 76% of immigrants diseases and cause 3.6% of total deaths. Lack of healthcare services to general medical support and prescriptions, lead immigrants to contact Emergency Department to receive medical assistance. Primary endpoints of this study were to assess the use of national healthcare system by immigrants, to determine the incidence for cardiovascular diseases and the frequency and type of risk factors for cardiovascular diseases in this patients.

No profit, observational, multicentre study was conducted from April to September 2012. We studied 642 foreign patients referring to ED for various symptoms/signs. 114 subjects referred for suspected cardiovascular disease and 105 had a confirmed final diagnosis of cardiovascular disease. More represented Ethnic origin was Caucasian (59%) while most represented country was Romania (24%). Main symptom recorded at ED arrival was chest pain (37%). Final Cardiovascular diagnoses were represented by: hypertensive crisis (28%), acute coronary syndrome (20%), acute heart failure (12%), atrial fibrillation (10%), chest pain (10%). Past medical history of cardiovascular disease, hypertension, obesity and male sex showed independent significant predictive value for cardiovascular disease diagnosis.

Our study provide support for the development of specific primary prevention of cardiovascular risk factors in immigrants with important role of culturally competent education of individuals and families. Better outpatient management seems to be needed in order to limit need to the emergency room referral.

MANAGEMENT OF ATRIAL FIBRILLATION IN THE EMERGENCY ROOM TODAY: ITALIAN EXPERIENCE

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Atrial fibrillation (AF) is the most common cardiac dysrhythmia and occurs in 3.3%-10% of emergency admissions. It is frequently quoted for people over the age of 75. AF is also associated with an increasing number of comorbidities, including arterial hypertension, dyslipidemia, diabetes mellitus, coronary artery disease, heart failure and valvular diseases. All these conditions may favor the development of AF altering cardiac structure and function. Significant morbidity and mortality, including 15% to 20% of all ischemic strokes and 20% of all strokes, result from AF. The overall mortality rate for patients with AF is approximately double than that for patients in normal sinus rhythm.

The first diagnosis and treatment often occur in the Emergency Room and the emergency physician has therefore to value the initial step towards the therapeutic decisions, including rhythm or rate control. The initial step towards the therapeutic decisions is the determination of AF duration, classification, onset date, date of discovery of AF, frequency, precipitating factors and symptoms. Heart rate control strategy aims to maintain a ventricular rate that protects the patient from consequences of tachycardia. Target ventricular rate control can be obtained by atrioventricular nodal conduction slowing drugs. Rhythm control strategy targets sinus rhythm restoration by pharmacological cardioversion (CV) (antiarrhythmic drugs) ± electrical cardioversion and maintenance by antiarrhythmic drugs. Issues related to antithrombotic treatment are pivotal in AF to prevent cardioembolic stroke, and are considered a primary objective of treatment in this condition, preceding – in relevance and logical considerations – issues related to rhythm or rate control, or of “upstream therapies”. Antithrombotic treatment of atrial fibrillation mostly revolves around anticoagulation, since the role of antiplatelet therapy is now confined to the minority of patients in whom antithrombotic treatment is warranted and in whom anticoagulation is contraindicated. Thromboembolic risk score CHA2DS2-VASc is the best known and practical and recommended by guidelines. TTE should be, therefore, performed in almost all patients with a first episode of AF. TTE has the advantages of a bed-side and wide availability and low cost. Informations about LA and LV size and function, right atrium (RA) and RV size and function, in addition to the presence of valvular, myocardial, pericardial and congenital heart disease which may predispose to AF, may be easily and rapidly acquired by two-dimensional (2D) and Doppler study using TTE. These information may be helpful not only in determining the conditions associated with AF, but also and risk for recurrent AF following CV. Risk of stroke and systemic embolism in patients with AF is linked to a number of underlying pathophysiological mechanisms. ‘Flow abnormalities’ in AF are evidenced.
by stasis within the left atrium, with reduced LAA (left atrial appendage) flow velocities, and visualized as spontaneous echo-contrast on TEE. In addition progressive atrial dilatation and oedematous/fibroelastic infiltration of the extracellular matrix (ECM) may favour the thrombus formation. The LAA is the dominant source of embolism (90%) in non-valvular AF. The main advantage of TEE is its ability to detect left and right atrial thrombi, spontaneous echo contrast or reduced LA appendage blood flow velocity, thereby identifying patients at risk for emboli. The main clinical use of TEE is in the management of anticoagulation in patients with AF of more than 48 hours or high-risk patients with AF of shorter duration who are candidates for CV. Although international guidelines are available, data from different Italian studies show that AF management in ED is still heterogeneous in terms of the dysrrhythmia control strategy chosen. Disparities were noted also in anticoagulation management, suggesting that this is still a main problem among patients with AF.

DIARRHEA FROM CLOSTRIDIUM DIFFICILE: AN ANTIBIOTIC-ASSOCIATED PANDEMIC BETWEEN HOSPITAL, POST-ACUTE CARE AND LONG-TERM HOSPITALIZATION

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Clostridium difficile infection (CDI), also known as C. difficile-associated disease or diarrhea (CDAD), is now considered to be one of the most important cause of hospital-acquired diarrhea with disease severity ranging from mild diarrhea to fulminant colitis. C. difficile is a Gram-positive, spore-forming anaerobic bacillus that produces two large toxins, A and B, which cause diarrhea and colitis in susceptible patients whose normal colonic bacterial flora has been previously disrupted by prior antimicrobial treatment. Since 2001, the prevalence and severity of C. difficile infection has increased significantly and a toxin variant strain of C. difficile known as BI/NAP1/027 has become widespread in North America and Europe. Metronidazole is the agent of choice for initial therapy for patients with mild to moderate CDI, vancomycin is recommended for those that do not respond to metronidazole, for severe infections and those with multiple recurrences of CDI. Infection control measures are necessary to reduce environmental contamination and to prevent the spread of C. difficile such as good personnel hand hygiene, gloving, barrier precautions, and thorough environmental cleaning to the patient, moreover the infection also can be prevented by a “good antimicrobial stewardship”.

MAJOR TRAUMA. FROM IMAGING TO MANAGEMENT

Mariano Scaglione
Thoraco-abdominal injuries are a significant cause of death in the polytraumatised patients. Early recognition and communication of life-threatening thoraco-abdominal injuries is the major task of the radiologists involved in the emergency room. Although most of these patients reach the hospital alive, lethality continues to remain high. Heart, thoracic great vessels, trachea, bronchus, pleura, lung, diaphragm, abdominal/retroperitoneal, vascular and solid organ injuries are potential cause of death. Any appropriate surgical/interventional management approach must be carried out “around the clock”, before thoraco-abdominal injuries reach the level of clinical evidence. On the other hand, non-operative management has actually become the standard of care for the most serious thoraco-abdominal injuries. These goals become feasible if a correct contrast-enhanced MDCT diagnosis, in a dedicated facility in which the trauma team works effectively 24 h a day, 7 days a week, is performed. Thus, in this lecture, the most serious thoraco-abdominal injuries will be illustrated, with special emphasis on vascular/injuries as well as the value of post-processing techniques, protocols, pitfalls, tips and tricks. Furthermore, the importance of a rational and integrated imaging approach will be pointed out and, finally, the role of the radiologist in the emergency room will be emphasized.

PROPOSAL OF RECOMMENDATIONS TO ACCOMMODATE AND ASSIST VICTIMS OF ABUSE AND SEXUAL VIOLENCE AT THE HOSPITAL SERVICES

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To address properly the cases of Intimate Partner Violence in the Department of Emergency and acceptance is necessary to ensure a minimum standard of performance and documentation legal doctor that allows the victims of all forms of violence to exercise your constitutional right and natural to a correct process health and justice.
The number of victims of abuse and sexual violence who access to the Emergency Room of the Network Hospital is on the rise:

- In the violence are the actions that bring suffering or physical damage, mental or sexual abuse, as well as the threat of such actions, coercion and the deprivation of freedom”.
- Violence compromises the enjoyment of human rights and fundamental freedoms, including the right to the highest possible level of physical and mental health.
- Violence against pregnant women has considerable frequency and its recognition and its prevention are of fundamental importance to prevent serious damage to the health of the woman and the unborn.
- IPV have a significant impact on the health of the people and on public health, which goes beyond the single violent event, and that has consequences in the short and long-term physical, mental and social.
- The non-recognition of violence as a cause of disease is one of the factors that favors the incidence of the outcome at a distance, these actions may bring up to murder that involves in Italy a death every three days (140 during the 2013).
- The name and the report of the author of the lesions with the victim only rarely is recorded from health to assist the victims and this helps to conceal the real consistency of the phenomenon and this often hinders the promotion of the same and the proceed of a effective judicial action.
- The Emergency department and one of the places where, in addition to practice the medical intervention on the emergency of the violence, it can promote the emergence of the violence in intimate relationships and you can start an organic response, also plan on psycho-social, building a network with the territory, the districts, the general medicine Doctors, the forces of law and order, the consultants, also involving the private and social associations of general engaged against the violence.
- In the last few years numerous Health Care Organizations and Hospital or regional authorities have tried to make a homogeneous the development of appropriate services in the field of assistance to victims of violence at the Emergency Room hospital, by providing appropriate procedures and arranging deliberations and Regional Laws.
- The National Plan against the gender-based violence considers appropriate for the opening of counters for hospitals and the promotion of a capillary formation of the medical staff to be able to build a bridge between a health model of hospitality and an integrated model of care for women that includes health actions and actions aiming at obtaining the respect for the rights to a proper legal and social assistance.
- Particular importance should be given to the preparation of the Medical Staff that is able to provide correct information is able to establish a relationship of aid aimed at preventing the uncomfortable individual and social, to juggle in making decisions in a time of crisis such as the use of health care facility.

Actions necessary to Healthcare Management of the victims of violence

- Adoption of procedures dedicated to assist the victims of IPV that comply with the requirements of clinical needs including those psychological, reporting of social health, and the minimum standards to ensure the right to a proper judicial process.
- Adoption of Plan corporate training to increase the awareness of the health workers hospital and territorial for the recognition and an adequate reception of victims, as well as engine of the development of a culture that contrasts the phenomenon. Are indispensable Updating courses required for all health personnel, in particular for those who work within the goddess, using for educators and trainers coming from institutional reality (medical, legal, social) that are already operating and by anti-violence centers, from the women’s associations and the private social.

It is necessary to establish the specific topic in degree courses the health professions, in Specialization Courses and in Graduate courses;

- Recognition in the context of the essential levels of assistance (LEA) of the assistance to the woman, the child and the adult in conditions of fragility and the identification of a code DRG (Diagnosis Related Groups) for violence specific and unique on the whole national territory.
- Organization of Services: a Hospital Integrated Center will be adequately financed in the Hospital of larger or provided to a Department of emergency and acceptance (DEA), dedicated to assistance to the victims that operates in agreement with the network of Emergency Department and with the 118. Must be open dedicated services in Hospitals where there are movers/providers (doctors, nurses, midwives/ci, psychologists and social workers) approved by the Directorate Health is dedicated to taking charge of the victims of violence, in close liaison with the regional network and that constitute the point of reference in the emergency.
- Cultural mediation for patients of other ethnic groups with language difficulties.
- Promotion, at the services of primary care and the outpatient clinics of General Practitioners or family counseling offices, a systematic screen for victims of abuse.
- The adoption of tools for the evaluation of the risk and the risk of relapse that take account of:
  (a) Frequency and severity of episodes of physical violence during the last year (threat with Weapons, threats of death, attempt to suffocation, availability of weapons at home);
  (b) Use of alcohol and/or drugs from the partner;
  (c) Obsessive control over activities of the woman.
  (d) Violence on children;
  (e) Attempted suicide of the woman.
  (f) Threat or attempt to suicide of vessatore;
  (g) Violent attitude outside the home, and/or on the objects and/or animals;
  (h) Previous convictions of the mistreated families;
  (i) Familiarity of violence, violent behavior within previous reports;
  (j) Presence or absence of an adequate network of services and the social network/family.
Mode of delivery of services

- The Hospital Integrated Center against the violence must be able to ensure:
  - A continuous support, also through a commercially available 24/24 and 365 days a year, on the part of medical personnel and expert psychosocial and motivated to assist the victims of violence and sexual abuse (women, adults and minors), also by using external staff.
  - To this end can be activated conventions and agreements with other hospitals, clinics and polyclinics territorial;
  - Use in the clinical practice of diagnostic and therapeutic procedures as uniform as possible in the territory, to the description, and treatment of ill-treatment.
  - Collection and archive of the finds objectives (with guarantee of the security of the chain of custody of evidence in view of the possible judicial proceedings) and correct documentation of the event (even with assessment of mental situation declared by the victim);
  - Ability to identify, thanks to the training of the operators of the goddess, and the most subtle presentations of violence and abuse that flock to the emergency department.
  - Presence of a staff capable of establishing a relationship of the aid with the victim, in respect of the will and of the times of the woman.
  - Construction of territorial networks making it possible to indicate to the victims services are available in the territory for the supportive therapy and references of the women’s associations and the third sector.
  - Operating in local realities;
  - The health personnel dedicated to the activity of the Center Integrated Hospital against mistreatment will include: doctors, ginecologhe/i, nurses and/or midwives/ci, social workers, psychologists, administrative.
  - It must be possible to activate a privileged route, by the entrance in the Emergency Room with the carrying out of the diagnostic tests and therapeutic, with the allocation of a code of appropriate triage that allows a take-over of the victims with reduced wait times (for this reason it is desirable to have the involvement of health care professionals can be found, they can dedicate assistance to the victims of violence a time greater than normally possible in the crowded emergency room of the large Italian cities);
  - Structural requirements and organizational to ensure the victim the maximum assistance in respect for the dignity, of the protection of the confidentiality and security of the victim (appropriate place of reception in the Emergency Room, suitable premises to visit, lounge equipped for children, possibility of hospitalization in the emergency, conventions with homes for women in situations of risk, etc).

Recommendations on the training of health professionals: educational aspects and content

1. The maltreatment: a problem to be addressed also in the field of health.
2. Definition of severity and type of mistreatment.
4. Persecutors and victims: the spiral of violence.
5. Sexual violence and its characteristics.
6. Female genital mutilation.
7. Violence assisted: characteristics and consequences.
8. Fundamental Principles to improve the response of health care facilities. Basic Elements of the techniques of listening, awareness and recognition of stereotypes on violence in relations of intimacy as elements of an obstacle to the reception of the victims; knowledge of the psychology of victims and offenders, how to avoid the emotional involvement malicious.
9. The systematic screening for the identification of victims of violence.
10. Recognition of the mechanisms of minimization, denial, justification or concealment of the event by the victim.
11. Marking of the dangerousness of the mistreated families and the risk of relapse: screening tools.
12. Information on available resources, the resources of the network.
13. Documentation of the forms of violence attributable medical, surgical, gynecological, psychological, psychiatric.
14. Health approach in the services of first intervention, research the consequences and occult lesions. Integrated Approach to multidisciplinary cases of violence.
16. Legal Aspects and medicolegal. Relations with the other actors of assistance to the victims: police, legal, courts and social services, associations of genre.
17. Correct coding and data collection (computerisation in network between the centers and the institutional and non-institutional, creating a unique and shared data report ).

Organizational Model

The actions carried out in the field are described briefly below:

1. Identification of the paths care within the hospital network;
2. Identification of the paths care outside the hospital;
3. Identification, in the hospital or in the territory, to a clinic for the treatment of the victims;
4. Identification of the procedures necessary for an important of evidence;
5. Preparation of a local procedure;
6. Drafting of a clinical record;
7. Identification of the professionals involved in service in order to give an integrated response;
8. Provision of a common database to ensure the completeness of the data;
10. Mode of transmission of the finds to the judicial authorities.
The intervention “including” is timely and vital for the proper management of the victim. The organization provides the following minimum points:

1) The victim of violence must be offered a support integrated multidisciplinary, available at an early stage, which will see the presence of medical personnel trained, support staff adequately trained, namely midwives/i and ginecologhe/the experts, psychologists, legal medical and when you need consultants psychiatrists and traumatologi, acting in a coordinated manner, in order to optimize the path welfare of the patient. The health personnel prepared can operate counselling interventions;

2) The victim of violence must be guaranteed the possibility of aid through the activation of a support network both social (put in protection of women and of any child) and connection with other Psychologists in the overrun of the trauma resulting from violence;

3) The Victim of violence must be given a special chance to complaint in the immediate or delayed by working on the territory with a network of professionals enlarged (Police, Social workers, Associations etc…);

4) Provide for scenarios where the victim may arrive in Emergency Room and peripheral does not want to be transferred to a Integrated Centre. In this case the Doctor which has charge of the patient must have available guidelines and protocols, in addition to the ability to interact, even over the phone, with the Integrated Hospital Center nearest;

5) Provide the possibility of Cultural mediation h 24 (also with the right of appeal to the phone system), of intervention of social workers and accommodation in reception centers.

Necessary data useful to the correct writing of a clinical folder

1) Acquisition of the informed consent specific: clinical, photography, forensic and to the investigation.

2) Modes and circumstances of the aggression, authors, elapsed time from the aggression.

3) Date and place of the attack, any other elements, gynecological history.

4) Visit general and status indication or psychological referring the patient.

5) Objective Examination gynecological in the case of declared or suspected sexual violence.

6) Laboratory Tests both clinical purposes that forensic.

7) An important materials for judicial.

8) Prophylaxis for sexually transmitted diseases.

9) Request for consultations and investigations.

10) Diagram of complaint to the Judicial Authorities.

Chain of Custody

The chain of custody is a specific aspect fundamental for the projection probative value and then to the reliability of the results of scientific investigations.

This refers to a process to document the chronological history of the exhibit, from the time of collection until its final destination. It is believed that the documentation used should provide at least the following indications of minimum:

- Construction/institution in which is carried out the repertamento;
- Identification of the victim (e.g., name and surname or code of the folder and initials of the victim);
- Type of exhibit and number of samples;
- Date and time of repertamento;
- Name and signature of the person who has made the repertamento;
- Last name, first name, and signature of the person who receives the exhibit;
- Date and time of delivery of the exhibit.


STRUCTURAL MYOCARDIAL ALTERATIONS IN DIABETES AND HYPERTENSION: THE ROLE OF GALECTIN-3

Jelena P. Seferovic

Background: Galectin-3 is a protein widely distributed in the heart, brain and blood vessels, and has a regulatory role in inflammation, immunology and cancer. Many studies demonstrated that the increased level of galectin-3 is associated with progressive fibrosis and stiffening of the myocardium. The aim of this study was to investigate the role of galectin-3 in patients with type 2 diabetes (T2D) and/or arterial hypertension (HT).

Methods: Study population included 189 patients, with no coronary artery disease, divided into three groups: group 1 (T2D), group 2 (T2D+HT), and group 3 (HT). All subjects underwent routine laboratory tests, as well as specific biomarkers assessment (galectin-3, glycated hemoglobin (HbA1c), N-terminal fragment B-type natriuretic peptide (NT-proBNP)). Cardiological evaluation included physical examination, transthoracic tissue Doppler echocardiography and stress echocardiography.
Results: The results of this study demonstrated significantly increased levels of galectin-3, blood glucose, and HbA1c in group 2. Also, echocardiographically, left ventricular (LV) diameters and IVS thickness were increased in this group of patients. Furthermore, in the same cohort a positive correlation between galectin-3 and NT-pro BNP, and galectin-3 and LV mass were demonstrated. In addition, a negative correlation between galectin-3 and LV end-diastolic diameter was revealed.

Conclusions: This study revealed that levels of galectin-3 were higher in patients with both T2D and HT, and correlated with LV mass, indicating the potential role of this biomarker for early detection of myocardial structural and functional alterations.

Keywords: type 2 diabetes, hypertension, galectin-3, myocardial fibrosis.

DIABETIC CARDIOMYOPATHY

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The cardiovascular complications of type 2 diabetes (T2DM) are contributing considerably to morbidity and mortality worldwide, heart failure (HF) being one of the most frequent. The adverse effect of T2DM on myocardium can develop early, and is clinically presenting as left ventricular (LV) diastolic dysfunction in the absence of other heart disease. The pathophysiology of DC includes the major metabolic features of T2DM such as hyperglycemia, hyperinsulinemia, hyperlipidemia, and the formation of both reactive oxygen species and advanced glycation end products. There is no pathognomonic diagnostic features of diabetic cardiomyopathy (DC) and no single imaging method exists for the accurate diagnosis. Clinical presentation is mostly mild, majority of the patients are asymptomatic or with nonspecific complaints. The major hurdles in diagnosing DC are imprecise definition and dissimilar criteria for diagnosis of LV diastolic dysfunction. DC is best defined as myocardial disease in diabetic patients characterized by LV diastolic dysfunction in the absence of hypertension, coronary artery disease or any other cardiac disease. LV diastolic dysfunction is the most important element of diagnosis of DC, best assessed by tissue Doppler echocardiography (E/E’ ratio). The prevalence of LV diastolic dysfunction in T2DM demonstrate the wide variations caused by diverse patient selection and heterogeneous criteria for its diagnosis. Patient selection varies in terms of age, duration, stage and microvascular complications of T2DM. Several clinical correlates were reported as related to DC such as: age, duration of T2DM, parameters of glycoregulation, insulin resistance and renal function. The treatment of DC should be initiated as early as LV diastolic dysfunction is identified. Various therapeutic options include improving diabetic control with diet, daily physical activity and reduction in body mass index. Both ant glycaemic (metformin and thiazolidinediones), and cardiovascular drugs (ACE inhibitors, beta blockers and calcium channel blockers) should be used to improve LV diastolic dysfunction.

HEART FAILURE: A MULTIETHNIC DISEASE

Cinzia Sighieri

The incidence of heart failure is increasing in developing countries like India, great part of Latin America, in the metropolitan china and in most of the great cities. The principle cause? The so defined “welfare”. The causes include coronary atherosclerotic disease, hypertension, diabetes. If progress has reduced the incidence of cardiac deaths, heart failure has become so frequent as to be considered the new epidemic. About 5,8 million people in the USA suffer from heart failure with more than 300000deaths /year.

Genetic diversity in human beings has revealed to be lower than that observed in other species and is principally due to variations in the populations rather than between the populations. The world population seems to derive from a single group of homo sapiens who emigrated from Africa about 55000-60000 years ago and from Australia subsequently colonized the rest of the world: in fact the genetic variability of the other continents is a subgroup of the African one. The genetic variability among the different populations is not such that we can define some exact and precise racial differences whereas genetic variants exist regarding the presence of certain enzymes, the response to a particular drug, the resistance to certain disease. It has recently been demonstrated that 4 genes of the renin-angiotensin system contribute to determining hypertension, not allowing a regular hydrosaline balance of the human body, reducing sodium elimination; this determines a risk three times higher of developing hypertension. Nutritional factors interacting with environmental and genetic factors seem to play a crucial role in the pathogenesis of complex disease. The study of such interactions is important for a global approach in the prevention of obesity, cardiovascular and metabolic disease.

Regarding the profile of the general health status of the immigrating population, a paradox is described with a better health profile of the first generation of immigrants with respect to the residing population. Two are the possible explanations: 1) because the less healthy immigrants return to their country of origin or 2) the “healthy migrant effect” that is the immigrants represent the most healthy and strong individuals of their community. Most of the immigrating population has less than 30 years. The immigrants arriving in their new destination would benefit of the best of the two worlds: the efficacy of the sanitary system of the hosting country and the good life style of the country of origin.

The immigrants then tend to undergo an acculturation process that involves a psychological and cultural change with the adoption of the so-called “western life style”. This implies a greater consumption of fat and alcohol, a reduced intake of fibers, a sedentary life style etc. with a dramatic increase in the incidence of obesity, diabetes, cancer, depression, and anxiety. This leads to an increased mortality, which becomes
even more evident in the immigrants of the second and further generations. Among the principle cause are also the smoking habit and the fact that unemployment and the absence of a regular income induces this population of immigrants to accept any type of job even those more dangerous in which their health is less protected.

The price to pay for the treatment of individuals with heart failure is very high since these patients undergo frequent hospitalizations and their quality of life is very low with a progressive deterioration of their health status. The only antidote is prevention.

In the first years of this century, a prospective observational study lasting ten years, The Multi-Ethnic Study of Atherosclerosis (MESA), was carried out. It enrolled more than 6800 patients with the aim of identifying eventual differences of age, gender and ethnic group in the incidence of subclinical differences and in the progression of risk factors and cardiovascular disease. In this large American cohort study the highest incidence of heart failure was identified in the Afro-Americans with respect to the other ethnic groups; this can be explained by the higher incidence of diabetes and hypertension. To effectively tackle the prevalence of heart failure in this particular group, the control of hypertension and diabetes must therefore be optimized. The MESA researchers have evaluated if heart failure risk factors, such as high pressure, smoke and diabetes, influence differently the various ethnic groups. The Afro-Americans have a higher incidence of hypertension and diabetes and the ethnic differences disappear if you keep this in mind. In future, to prevent heart failure, new risk charts are necessary which consider the higher risk in the Afro-American ethnic group.

We now report the experience of our hospital, which includes an Emergency department and is localized in a very populated area with multi-ethnic inhabitants. We analyzed the number of multiethnic patients admitted since 2010 and tried to identify, in the three ethnic groups more represented (Rumanian, Bengali and Chinese) if differences among the type of hospital admission existed. From the 1st of January 2010 to the 30th of June 2014 the foreigners who arrived to our Emergency Department were more than 20%, in constant rise, reaching 23.5% in 2014. The three major ethnic groups represented were the Rumenian (22%), Bengal (18%) and Chinese (8%). For the foreigners the need for hospital admission was 11% whereas for the Italians it was 15%. This is due to the younger age of the foreigners with respect to the Italian population. In fact 38% of the Italians who arrive at our Emergency Department are older than 64 years whereas in the other three ethnic communities this age group accounts for less than 1%

A difference was observed regarding the reason of admission in the hospital among the different ethnic groups: chinese and rumenians entered primarily for surgical or pregnancy and childbirth reasons (nearly 90%) whereas the Bengal have a high incidence of admission in the cardiac intensive care unit (CICU) (10%). Admission to the CICU was practically non existent for the chinese and less than 4% for the Rumansians.

Although the immigrant patients are generally younger, they tend to undergo a psychological and cultural changing process with the adoption of the western style of life and the consequent increase in the incidence of hypertension, obesity, diabetes, cancer and depression. The characteristics of the Bengali ethnic group was already known in the Anglo-saxon world where this particular population immigrated earlier; the incidence of cardiovascular disease has led to define this condition an epidemic for the Bengali ethnic group.

HOW TO DETECT THE PRESENCE OF END STAGE HEART FAILURE IN CLINICAL PRACTICE

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Heart failure is a major public health problem, with a patient population of at least 10 million in Europe and approximately 5 million in North America. Because of its age dependent increase in incidence and prevalence, heart failure is one of the leading causes of death and hospitalization among the elderly. As a consequence of the worldwide increase in life expectancy, and due to improvements in the treatment of heart failure in recent years, the proportion of patients that reach an advanced phase of the disease, so called end stage, refractory or terminal heart failure, is steadily growing. Patients with end stage heart failure fall into stage D of the ABCD classification of the American College of Cardiology (ACC)/American Heart Association (AHA), and class III–IV of the New York Heart Association (NYHA) functional classification; they are characterized by advanced structural heart disease and pronounced symptoms of heart failure at rest or upon minimal physical exertion, despite maximal medical treatment according to current guidelines. This patient population has a one year mortality rate of approximately 50% and requires special therapeutic interventions. Every attempt should be made to identify and correct reversible causes for a worsening of heart failure, such as poor patient compliance, myocardial ischemia, tachy or bradyarrhythmias, valvular regurgitation, pulmonary edema, infection, or renal dysfunction.

The diagnosis consists of:

- Signs and symptoms. Although heart failure patients are often assumed principally to suffer from fatigue and dyspnea, a majority have pain, and depression is extremely common. Other sources of suffering include edema, insomnia, anxiety, confusion, anorexia, and constipation. The symptom severity number can fluctuate, even within a single day. Cardiogenic shock is characterized by hypotension, tachycardia and third sound (gallop).

- Blood tests consist of kidney, liver and thyroid function, blood count. Brain natriuretic peptide (BNP) or N-terminal pro-B-type natriuretic peptide (NT-proBNP) can help in diagnosing heart failure. The cut of values according to European Society of Cardiology (ESC) guidelines are 300 pg/ml for NT-proBNP and 100 pg/ml for BNP. Activation of the sympathetic nervous system and enhanced release of vasoconstricting and sodium-retaining neurohormones, such as Ang II, norepinephrin, endothelin-1 and arginine vasopressin are present These neurohormonal...
systems are central to both the pathophysiology of HF and the regulation of multiple aspects of renal function. However, the relationship between neurohormonal activation and cardiorenal syndrom is not well defined. KIM-1, N-GAL, cystatin C are called novel biomarkers of kidney injury. The complex neurohormonal interactions, large interindividual variability and the disconnection between serum and local activities result in a weak association between serum markers of neurohormonal activation and GFR in patients with heart failure. Serum lactate >2 mmol/L was a prognostic marker in Cardio shock trial.

Chest X-ray. Heart shape is usually enlarged and fluid retention is visible. Electrocardiography (ECG). All pathological abnormalities can appear. Atrial fibrillation and bundle branch blocks are frequently present. Signs of ischemia can explain the etiology of heart failure. Echocardiography is a must. Systolic and diastolic function should be measured. About 1/3 of the patients do not have decreased ejection fraction. Valve abnormalities (stenosis or regurgitation) can be the etiology of heart failure. Right heart catheterization is recommended, with measuring of pulmonary wedge pressure and cardiac output. Pulmonary resistance is calculated in all heart transplant candidates. Coronary catheterization (angiogram) is recommended in all patients urgently if ischemic etiology is supposed to be the cause of heart failure. The rest of the patients should have an angiogram selectively.

Cardiac computerized tomography (CT) scan or magnetic resonance imaging (MRI) can be used to diagnose heart failure. Myocardial biopsy is rarely used to diagnose certain types of heart muscle diseases.

### PROJECTS FOR IMPROVING HEART TRANSPLANTATION RESULTS

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Heart transplantation (HTX) has become an accepted treatment for selected patients with end-stage heart failure. The main diagnosis leading to heart transplantation is dilative cardiomyopathy or coronary artery disease. There are two transplant centres in Czech republic – Prague, since 1984 and Brno since 1992, in which more than 1000 heart transplantsations were performed. In Brno centre there were transplanted 412 adult patients till the end of 2012.

The main task for present time is

1. **Non-invasive assessment of allograft rejections.**
2. **Introduction of new and more potent immunosuppressant drugs with less adverse effects.**
3. **Early detection of graft vasculopathy.**

#### 1. Diagnosis of rejection without endomyocardial biopsy.

The non-invasive methods include echocardiography - tissue Doppler imaging, densitometry, contrast echocardiography, strain and strain rate or determining the levels of certain humoral mediators: interleukin, brain natriuretic peptide, troponin T or directly determining the release of donor DNA or microRNA in the blood of the recipient.

Changes in the early phase of rejection especially affect diastolic function. Later it was found that rejection leads to decrease in ejection fraction. However, decreased ejection fraction is characterized for a more severe grade of rejection and for lower grades is less sensitive. Assessment of diastolic function seems more promising, because diastole is affected earlier and thus could be more sensitive non-invasive marker of rejection.

Other possibility for detection of early rejection is tissue Doppler imaging (TDI). Peak velocity of mitral annulus motion above 135 mm/s had 93% sensitivity, 71% specificity and 98% negative predictive value for detection of rejection. High velocities of TDI excluded presence of rejection. Based on this TDI could serve as a screener for patients after heart transplantation and myocardial biopsy could be performed only in the case of low velocities.

Other possibility for detection of rejection by new methods is blunting of cyclic gray level variation. Patients with rejection had significantly lower cyclic variation of interventricular septum and posterior wall of left ventricle.

In our previous study we also used cyclic variation of integrated backscatter for detection of rejection in patients after heart transplantation. This method was not sensitive enough for patients with mild cellular rejection who formed our study population.

In the future, it could be beneficial to introduce new echocardiographic techniques, such as strain and strain-rate. There were found no correlations for detection of rejection by humoral substances, e.g. troponin or interleukin 6, which would allow their routine use.

It is under investigation to identify the correlation of BNP levels and the occurrence of donor DNA or microRNA in the blood as markers of possible rejection.

The gene expression was also studied. Horwitz et al. described the relationship of gene expression RNA in peripheral blood cells and rejection in 189 patients after the HTX and found some correlation.

#### 2. The new immunosuppressive agents known as inhibitors of proliferation: sirolimus (rapamycin) and its derivative RAD (everolimus) act by the mechanism of TOR (target-of-rapamycin) inhibition. They allow to minimize the dose of calcineruin inhibitors (CNI) and thus reduce the nephrotoxicity without compromising effectiveness of immunosuppression. They have a further protective effect against CMV infection and antitumour and antiproliferative activity. Reasons for conversion to sirolimus or everolimus in patients after heart transplantation are:

- The new immunosuppressive agents known as inhibitors of proliferation: sirolimus (rapamycin) and its derivative RAD (everolimus) act by the mechanism of TOR (target-of-rapamycin) inhibition. They allow to minimize the dose of calcineruin inhibitors (CNI) and thus reduce the nephrotoxicity without compromising effectiveness of immunosuppression. They have a further protective effect against CMV infection and antitumour and antiproliferative activity. Reasons for conversion to sirolimus or everolimus in patients after heart transplantation are:
chronic calcineurin nephrotoxicity, graft vasculopathy, refractory rejection, myopathy, cyclosporine neurotoxicity, malignancy. There are two regimes with mTOR inhibitors: either calcineurin-free (mTOR inhibitor + mycophenolate mofetil) or low doses of CNI + mTOR. The first type of regime is preferred in patients later after HTX, the second one also in early heart transplant recipients. In both regimes there is a necessity to control drug blood levels, mineràle and blood count and after months echocardiography. There are questions about the necessity of myocardial biopsy. It should be done in CNI free regimes or when there is a new occurrence of systolic dysfunction on echocardiography.

3. Cardiac allograft vasculopathy (CAV) is a major cause that limits the longterm success of cardiac transplantation. A diagnosis of CAV significantly decreases survival time: CAV is one of the major causes of death at 5 years or longer after transplantation. A fundamental feature in the development of CAV is vascular remodeling, which initially involves the injury and apoptosis of endothelial and parenchymal cells and subsequently the migration and proliferation of smooth muscle cells that leads to intimal thickening and allograft vessel occlusion. This vascular remodeling process gives rise to the classic histopathologic lesion of CAV: the concentric fibromuscular hyperplasia of the intima and media with luminal narrowing of large and small epicardial coronary arteries, occlusion of the smaller vessels, myocardial infarction, and graft heart failure. The initial change in CAV is mild intimal thickening, which can be identified in the proximal arteries as early as 6 months after transplantation. Coronary angiography is not sensitive enough to repeal the initial changes. Golden standard is therefore intracoronary ultrasound (IVUS) which is, however, more expensive. The very beginning of intimal changes and structures of the vessels could imagine optical coherent tomography (OCT) or NIRS. The first studies are enrolling the patients.

SPINAL TRAUMA

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Spinal fractures represent 3 to 6% of all skeletal injuries. A systematic review by Sekhon found that spinal injuries, including all types of spinal injuries, also the frequent whiplash injuries, involving with high frequency cervical spine in 55%, and less frequently thoracic, lumbar and lumbosacral spine in 15% respectively.

The risk of spinal cord damage is greater in cervical spine injuries, while vertebral fractures are much more common in thoracic and lumbar segment than in cervical.

Plain radiography (x-ray), CT and MRI are used for evaluation of spine trauma; x-ray are usually the first examination in minor trauma, while ct, especially multidetector CT (mdct) has replaced radiography as the primary modality for assessment of osseous injuries in the adult in many major trauma center. Mdct permits multiplanar reconstruction in every plane without loss of spatial resolution in very short time. MRI is optimal for ligaments and absolutely for spinal cord damage. At minimum sagittal T1 and T2 images should be obtained: T1 for anatomic details and T2 for adequate evaluation of ligaments integrity, marrow oedema, spinal cord damage, disk herniation. Gradient echo images are optimal for hemorrhage in the cord. MRI does not offer superior bone fragment evaluation respect to CT but it is much better in evaluation of acute vertebral compression fracture showing oedema in bone marrow. Epidural hematoma, visible by MRI, is frequently seen in spinal cord injury and is generally asymptomatic.

A particular type of spinal cord injury occurs in children, without radiographic abnormalities (SCIOWA-spinal cord injury without radiographic abnormality) and is related to the high mobility of the ligament.

The type of vertebral fractures depends on the mechanism of injury. In cervical spine the mechanism of injury include: hyperflexion, hyperextension, rotation, vertical compression fracture, lateral flexion. The type of injury in thoracolumbar segment is: compression or wedge, burst, flexion distraction (Chance) and fracture dislocation.

In the evaluation of spinal fracture the concept of stable vs unstable spinal injuries is of critical importance. Many classifications have been proposed to define stable or unstable fractures, and the most used system is based on 3-columns Denis theory. The 3-columns Denis theory divides the spinal column into anterior, middle and posterior columns; the anterior column consists of the anterior vertebral body, anterior longitudinal ligament and the anterior annulus fibrosus. The middle column consists of posterior vertebral body, posterior longitudinal ligament and posterior annulus. The posterior column consists of the posterior vertebral arch (lamina, pedunule, facets, spinous process) and ligaments (flavum, interspinous, supraspinous). When two columns are disrupted the injury is considered unstable. It is important for the radiologist to describe exactly the morphology of vertebral and ligament injuries/fracture so as to be able to communicate to the physician the type of spinal injury/fracture and its stability or instability. The radiological features of mechanical instability include: displacement/translation greater than 2mm (indicating ligament disruption), widening of the interspinous space, the facet joints or the interpeduncular distance, disruption of the posterior vertebral line, widening of the spinal canal, vertebral body height loss more than 50%, kyphosis more than 20°.

Awareness of the neurologic status and stability of the injury allows the clinician to decide conservative vs surgical treatment.

“Chance” fracture first described by GQ Chance (Br J Radiol 1948) involves compression of the anterior column with distraction of the middle and posterior columns. The term “distraction” refers to a complete separation of bone fragments in a craniocaudal direction. A classical Chance fracture is the lap belt injury decreasing in incidence after the routine use of 3-point restrain; it is an horizontal fracture trough the spinous process, the lamina the pedicles, the intervertebral disk space, and the posterior longitudinal ligament, supraspinous and interspinous ligaments. Chance fracture most commonly occurs at level L1-L3; up to 50% of Chance fractures are associated with abdominal viscera injuries (pancreas, duodenum). Burst fractures refers to comminuted fracture of the vertebral body extending trough both superior and inferior vertebral plate; it is typically an unstable fracture involving anterior and middle columns of Denis. CT is superior to x-ray in evaluating burst fracture demonstrating comminuted vertebral body; radiography usually shows a wedge shaped vertebral body with widened pedicles.
TEACHING EXPERIENCE IN EMERGENCY MEDICINE IN AUSTRALIA

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Introduction: Emergency Medicine within Australia is a well-established specialist clinical practice with the College being in existence for over 30 years. The training programme is regarded as excellent with Australian Emergency Medical practice amongst the leaders internationally. We review the current exposure and education of practitioners of Emergency Medicine in Australia and look at innovations and opportunities for collaboration into the future.

Method: A review of the current curriculum and opportunities for teaching within Emergency Medicine is provided. Experience from trainees is also shared through survey and focus group data.

Results: Qualitatively junior doctors training within Emergency Medicine enjoy the clinical practice and the experiential learning. The increase in simulation has aided confidence for clinical practice. Satisfaction of the training and of progressing into specialists of Emergency Medicine is limited through crowded departments and ‘access block’ with frustration expressed at the slowness to achieve sustainable change to deliver optimal clinical care.

Discussion: Training of Emergency Specialists requires a complex array of techniques from one to one training and observation to include sharing of concepts and development of a reflective clinical practice. Simulation has helped to improve patient safety and the focus on developing Team education is being incorporated into training efforts of the future.

MANAGEMENT OF MAXI EMERGENCIES IN L. DA VINCI AIRPORT

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The airport of L. Da Vinci in Rome is the biggest Italian airport and the sixth in Europe. It’s considered the second biggest city in Lazio due to the volume of people that work there everyday, almost twenty five thousand, and passengers, almost twenty five hundred thousand. In 2013, more than 36 million passenger passed through L. Da Vinci airport.

Aircraft accidents are statistically the most frequent major emergencies that happen nowadays, due to the increasing number of passengers and flights. The airport is also one of the hottest and most delicate places for the risk of terrorism attacks; it’s also a big filter in preventing the spread of infectious diseases from around the world. The Aeroporti di Roma Emergency medical team is every day called to provide assistance to all the sick passengers, airport operators, potential airplane crash and terrorist attack victims. All the emergencies are secured 24 hours a day by highly trained doctors, nurses and drivers rescuers, always on duty and sufficient in number to ensure the handling of emergencies.

The fleet of vehicles consists of ten ambulances, one jeep ambulance and a 4WD track which contains all the material (BLS and ATLS kits, burns kits, oxygen kits, stretchers, body bags etc...) to set up an advanced medical post everywhere in the airport area or near by. A first aid and emergency room is inside the airport and a stable advanced medical post is located on every runway.

Due to the different types of intervention and the complexity scenario of a hub airport, three types of manuals have been devised by Aeroporti di Roma for the management of maxi emergencies.

All these features, the variety of interventions and patients and the powerful resources available, make of every day a constant challenge and the airport a unique place to work.

DECISION MAKING WITH HIGH SENSITIVE TROPONINS: THE CARDIOLOGIST POINT OF VIEW. PRO

Marco Tubaro

From many years the determination of the blood levels of cardiac troponins (cTns) has been a key role in the evaluation of myocardial necrosis and in the diagnosis of acute myocardial infarction (AMI). Due to the lack of sensitivity particularly in the early presenter patients with chest pain, a high sensitivity troponin assay (hs-cTns) has been developed to allow more accurate determination of very low blood levels of hs-cTns in many cardiac and non cardiac diseases and also in the apparently illness-free population.

These assays are capable to measure hs-cTns in the concentration of single digit picograms/ml, with the possibility to delineate the distribution of hs-cTns in the normal population and to determine its 99th percentile. The hs-cTns concentration at the 99th percentile is used as cut-off value to diagnose myocardial necrosis, provided that the laboratory performance shows a coefficient of variation (CV) < 10% at the decision level (even if a CV < 20% is still considered acceptable).
The diagnostic process of acute myocardial necrosis is not linked to a single hs-cTn determination, but more to the kinetic profile of the biomarker: a delta between two consecutive measures in the range of 20 to 50% is considered representative of an acute necrotic process of the myocardial cells. In case of a clinical condition of myocardial ischaemia, this hs-cTn elevation can be considered diagnostic of AMI. Following the first sample at patient entry, the usual protocol of hs-cTns determination in acute chest pain patients provides a second measure at 6 hours and a possible third measure at 12 hours; recently, a faster 3 and 6 hours protocol has been included in NSTEACS guidelines, while more recent papers presented protocols of less than 3 hours and even of 1 hour (always after the entry sample at time 0).

In addition to its diagnostic capability, hs-cTns have a very potent prognostic role, even at extremely low blood levels (between limit of detection and 99th percentile) and also in the normal population.

**ACUTE AND EMERGENCY MANAGEMENT OF ELDERLY PATIENTS: NEW ORGANISATIONAL MODELS**

Louella Vaughan  
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The demand for acute medical admissions has risen relentlessly over recent decades and older people constitute the fastest growing section of the admitted population. Older patients also often present with complex disease, with multiple disease co-morbidities and frailty, and newer evidence suggests that these patients may be harmed by long stays in the Emergency Department and that outcomes for many patients are much poorer than previously thought. This has led to the suggestion that the initial investigation and management of older patients should be reviewed, with the proposal of new models of geriatric emergency care. This presentation will review these models of emergency and acute care, including Acute Care of the Elderly, the Geriatric Emergency Department, the Emergency Geriatric Unit, and Comprehensive Geriatric Assessment. Many of these models have common themes, such as detailed review, patient-centred care, medication review and a specialised environment, and these will be reviewed to generate more general recommendations about how care for older patients in the acute and emergency settings can be improved.

**ECHOCARDIOGRAPHY IN THE EMERGENCY DEPARTMENT IN PATIENTS WITH ACUTE HEART FAILURE**

Hyun Suk Yang, MD, PhD  
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Acute heart failure is one of the urgent reasons for presentation to the emergency department. Echocardiography is a fundamental tool in the diagnosis of heart failure, and the bed-side accessibility and rapid non-invasive identification are major benefits, especially in emergency departments. Hence, the role of echocardiography in emergency departments as a diagnostic tool and a guide to the therapy is expanding. Several emergency cases of patients with acute heart failure will be presented with AVI files: Left ventricular dysfunction (systolic, diastolic), right heart failure, acute pulmonary thromboembolism, pericardial effusion, decompensated valvular heart disease, and acute coronary syndrome. Not only acute diagnosis, but also hemodynamic understanding of LV filling pressure, pulmonary hypertension, and volume status via Doppler echocardiography are helpful in patient management.

Bed-side 2D and Doppler echocardiograms performed in emergency departments can help rapidly guide the diagnosis and management of patients with acute heart failure.
5th Italian GREAT Network Congress

Editors:
Salvatore Di Somma
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POSTERS ABSTRACTS

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**Topic: BIOMARKERS IN ACUTE DISEASES**

**Soluble ST2 and troponin I combination: useful biomarker for predicting development of stress-induced cardiomyopathy in patients admitted to the medical ICU**

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**Background:** Stress-induced cardiomyopathy (SCM) not infrequently developed in patients with non-cardiac medical illness; however, cardiac imaging is not a screening tool, and a unique biomarker has not been established. We tested the hypothesis that the novel soluble ST2 has additional predictive value in SCM.

**Methods:** Between May 21 and August 20, 2014, we prospectively enrolled 85 patients admitted to the medical ICU—finally we analyzed 81 patients (excluded 2 for coronary, 2 for technical issues). We performed echocardiography on the day of ICU admission (D0) and on the third day (D2) to diagnose the development of SCM, with a corresponding measurement of plasma soluble ST2. Routine biomarkers (Troponin I, BNP) were measured on D0. We compared the biomarkers between the SCM and non-SCM groups.

**Results:** Of the 81 patients (Age 64 ± 18 years, Male 49), 5 patients died within 48 hours of admission. SCM was diagnosed in 22%. The SCM group (n=18) showed higher Troponin I and ST2max levels than the non-SCM group (n=58): 0.461 ± 0.780 vs. 0.059 ± 0.124 ng/ml, p=0.038; 223.3 ± 42.3 vs. 192.2 ± 87.9 ng/ml, p=0.050, respectively. BNP revealed no significant difference (896 ± 1378 vs. 360 ± 847 pg/ml, p=0.133). In receiver operator characteristic (ROC) analysis, Troponin I had an AUC of 0.687 (p=0.017); in patients with normal Troponin I (< 0.3 ng/ml; n=69), the ST2 (D2) predicted better than Troponin I (AUC 0.682, p=0.072; AUC 0.599, p=0.327, respectively), of an optimal cutoff value of 227.5 ng/ml.

**Conclusions:** A combination strategy of Troponin I and ST2 seems useful in predicting SCM. The addition of ST2 for those with normal Troponin I resulted in a significant improvement in the predictive power regarding the development of SCM in a medical ICU.

**Topic: EMERGENCY MEDICINE, FUTURE PERSPECTIVES AND TECHNOLOGICAL DEVELOPMENT**

**Great lps - research proposal of an international survey on diagnostic lumbar punctures and the management of post dural puncture headache**

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**Background:** Diagnostic lumbar punctures are frequently performed in internal medicine and its affiliated specialties to aid in the diagnosis of various infectious and neurological conditions. Complications are closely linked to the preparation, choice of needle and the procedure itself. For example, the correct choice of needle type and size alone has been proven to reduce the risk of post dural puncture headache from 36% to 0.9% percent. The management of this very distressing condition does also vary significantly. Unfortunately, clinicians have been slow in adapting their tradition based practise to long known and well-founded evidence.

**Methods:** A United Kingdom wide survey into lumbar puncture techniques and also of the management of the most frequently encountered complication of post dural puncture headache has already been designed and my group has started to collect responses. Questions regarding the pre procedural preparation, the choice of needle type and size, and the procedures itself, as well as the management of post dural puncture headache are being asked. The questionnaire does not take more than 5 minutes to complete. Most questions allow answers in multiple choice format with the possibility of an alternative written “other” answer.

A sample version of the questionnaire can be accessed at https://www.surveymonkey.com/s/2NQ3CHQ. Whilst other smaller surveys into lumbar puncture techniques have been published in the past, this is the most comprehensive so far. I would like to extend this survey to other member nations of this GREAT organisation. The questionnaire can easily be translated and adapted and then with the help of interested co-investigators distributed within the member countries of GREAT.

**Results:** The results are easily analysed using simple descriptive statistics. These will be published correlating best evidence based practise with the results of the survey.

**Conclusions:** This is a very simple and easily performed research project. Nevertheless, it is relevant to our day to day clinical practice and the risk of exposing our patients unnecessarily to possible harm. I am hoping to reduce the risks and side effects of the procedure itself and as
such improve overall patient care. A wide participation and high number of responses would allow our organisation to become more involved in the creation of guidelines throughout our member nations.

**Topic: BIOMARKERS IN ACUTE DISEASES**

ST2 marker might help to stratify in-hospital high risk patients with tako-tsubo cardiomyopathy

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**Background:** The use of a marker able to detect high risk cardiovascular disease patients for adopting the best actions to reduce the worsening of clinical condition is fundamental. Takotsubo cardiomyopathy (TTC) is a disease that mimics acute coronary syndrome (CAD) at presentation with a good prognosis and with a complete left ventricular function recovery. The aim of the study was to assess if ST2, marker of myocardial fibrosis and of outcome prognosis has potential aid in risk stratification in TTC patients.

**Methods:** We studied 21 subjects with clinical and angiographic diagnosis of TTC and 43 patients with the diagnosis of CAD (63.3 ±12.5 years versus 69.5 ±16.0 years, p=ns for TTC and CAD patients respectively). All subjects underwent clinical and instrumental workout, such as troponin I (cTnI) echocardiography and angiography. ST2 concentration was determined in plasma samples by mean of the ELISA (highly sensitive Presage® ST2 Assay), following the manufacturer instructions. The difference between the 2 groups was assessed by unpaired Student t-test.

**Results:** Baseline haemodynamic and clinical characteristics were not different among the two groups but heart rate (91.7 ±23.6 vs 79.3 ±18.6 bpm, p=0.03 for TTC and CAD patients respectively). Although TTC patients had lower values for ST2, cTnI and ejection fraction, the difference did not reach the statistical significance. The TTC and CAD patients were then divided according to the upper fourth quartile of ST2 concentration (95 ng/ml). Among the TTC group with high ST2 there were 4 patients had high ST2 values (193.3 ±62 versus 30 ±4.8 ng/ml, p=0.003) and 8 in the CAD group (352.7 ±200 vs 34.17 ±48.6 ng/ml, p<0.0001). Four patients had stent implanted, one patient had concomitant severe aortic stenosis, 3 patients died due to cardiogenic shock. All CAD patients with low ST2 underwent stent implantation, and 1 patient had heart surgery. Patients with high ST2 concentration were more likely to have increased cTnI and EF but the difference did not reach the statistical significantly.

**Conclusions:** ST2 may be a useful marker for helping stratify high risk patients with TTC, considered a benign disease with a very good prognosis.

**Topic: BIOMARKERS IN ACUTE DISEASES**

The utility of pyrogenic cytokine (IL-1beta, TNF-alpha and IL-6) detection in risk stratification of critically ill febrile patients in emergency department

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**Background:** Aim of our study was to evaluate the prognostic value of pyrogenic cytokines (IL-1beta, TNF-alpha and IL-6) detection associated with Mid regional pro-Amedullin (MR-proADM) and the APACHE II score in febrile patients admitted to the Emergency Department (ED).

**Methods:** 64 patients in the Emergency Room (ER) during a period of 12 months with body temperature > 37 °C were enrolled for this study. In order to compare MR-proADM and cytokine values, a control group of 40 healthy volunteers was recruited. For each subject the APACHE II score was calculated.

**Results:** MR-proADM and cytokines were significantly higher in patients compared to controls (p<0.0001). When APACHE II score was correlated to MR-proADM and cytokines and grouped into quartile, it showed a significant increase in TNF-alpha and IL-6 levels (p<0.0001). A significant stepwise increase in MR-proADM in accordance with IL-6 quartile levels was observed (p<0.0001). The receiver operating characteristic (ROC) curve showed the ability of those combined biomarkers to predict hospitalization.

**Conclusions:** The combined use of MR-proADM and cytokines can help the febrile patient’s management in the ED, predicting a subsequent hospitalization of such individuals.
**Topic: RESPIRATORY CRITICAL CARE MEDICINE**

**Use of pre-hospital ultrasound in the patient with dyspnoea: evaluation of diagnostic accuracy in Pavia’s reality**

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**Background:** The use of pre-hospital ultrasound for chest examination, especially in dyspnoeic patients, has always been discussed over the years, this due to a lack of standard protocols and to the fact that the chest ultrasound is based on artefacts identification, not on echographic signs and images as for the other body segments.

A research by Daniel Lichtenstein and Gilbert Mezière, published in Chest in 2008, assessed the performance of the pulmonary ultrasound examination in 301 adult patients with acute respiratory failure: the Authors developed a protocol, the BLUE PROTOCOL (Bedside Lung Ultrasound in Emergency) that, through the evaluation of few echographic signs, leads to different diagnostic hypotheses. The echographic signs that have to be investigated are: lung sliding, presence of A and B lines, lung point, possible presence of pulmonary consolidation or pleural effusion and a compression ultrasound has to be performed.

**Methods:** We evaluated and critically analysed the records of all dyspnoeic patients examined with pre-hospital ultrasound on the supervising area of AAT Pavia through the period between January 1st, 2014 and June 30th, 2014, for a total of 94 patients.

**Results:** The 38% of those 94 patients had received a pre-hospital diagnosis of acute pulmonary oedema, another 38% was generically diagnosed with dyspnoea, 9% with pneumonia, 12% with COPD and 3% with pleural effusion.

For every patient, we evaluated if the pre-hospital diagnosis was consistent with the one made at the Emergency Room discharge: in 85% of the patients, the diagnosis was the same. The maximum concordance was seen for pleural effusion (100%); regarding the patients with pre-hospital diagnosis of acute pulmonary oedema and generic dyspnoea, the congruity with the Emergency Room diagnosis was 86% for the first group and 89% for the second one. The maximum variance concerned the diagnosis of pneumonia and COPD: only 38% and 18%, respectively, were consistent with the E.R. discharge diagnosis.

**Conclusions:** As concerning the diagnostic accuracy (assessed comparing the pre-hospital diagnosis with the Emergency Room discharge one) in dyspnoeic patients evaluated with ultrasound examination, our data show excellent results regarding the identification of pathological conditions like pleural effusion and acute pulmonary oedema, in which early diagnosis and treatment are essential for a better outcome of the patient.

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**Topic: EMERGENCY MEDICINE, FUTURE PERSPECTIVES AND TECHNOLOGICAL DEVELOPMENT**

**US examination in pre-hospital scenarios: the experience of AAT 118 Pavia**

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**Background:** The applications of ultrasound examination in pre-hospital scenarios are increasing more and more, a demonstration of this being the large number of studies and guidelines published over the last decade on the subject. The ultrasound examination has a relevant role, especially for clinical pictures such as dyspnoea, trauma, chest pain and cardiac arrest.

**Methods:** We evaluated and critically analysed all the records of patients examined in pre-hospital setting of the supervising area of AAT Pavia through the period between January 1st, 2014 and June 30th, 2014; the clinical presentations contemplated were dyspnoea, chest pain, cardiac arrest, trauma, abdominal pain, shock, pregnancy-related conditions and syncope. An analysis of the time schedule was performed and were evaluated its compliance to guidelines and the performances for each clinical presentation.

**Results:** The records of 1433 patients were examined: 128 with cardiac arrest, 401 with dyspnoea, 294 with trauma, 363 with chest pain, 73 with abdominal pain, 160 with syncope, 2 with shock and 18 with pregnancy-related conditions.

We evaluated the percentage of ultrasound examinations performed for each clinical picture: the best performances were in cardiac arrest (61%), dyspnoea (69%) and trauma (53%) management. We also compared the time spent on the patient, whereas the ultrasound examination was or was not performed: in the first case, the times are, on the average, 6 minutes longer. Specifically, 3 minutes longer for trauma, 5 for dyspnoea and 9 for cardiac arrest. No differences, instead, were seen as for chest pain and pregnancy-related conditions.

**Conclusions:** The AAT Pavia performances regarding the use of ultrasound in pre-hospital settings were excellent and are consistent with the training programmes offered to the physicians working in our reality.

As for the time schedule analysis, they are consistent with the international guidelines.
**Topic:** EMERGENCY MEDICINE, FUTURE PERSPECTIVES AND TECHNOLOGICAL DEVELOPMENT

**Cost-effectiveness evaluation of Vscan in patient referring to ED for abdominal pain**


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**Background:** Acute abdominal pain is commonly defined as pain of less than 1 week’s duration.1 In USA abdominal pain was the principal reason offered by patients for visiting Emergency Department’s (ED) in 2000 and accounting for 8 million (7%) of the 119 million ED visits in 2006.2 Economically, it is estimated that pain costs to society $61.2 billion annually in lost productivity 3. In our hospital the incidence of acute abdominal pain is about 9%/year (4,356 pts).

Bedside ultrasonography can be used to quickly evaluate patients for free intraperitoneal fluid, volume status, and presence of aortic, renal, bladder and cholecyst pathology. With Vscan examination we could reduce the use of diagnostic procedures, length of stay and hospital admission and increase ED staff productivity.

**Methods:** Our study is a prospective observational study. The enrolment will be leaded on 200 consecutive patients arriving to ED with acute abdominal pain characteristics of renal colic, biliar colic, cholecystitis, abdominal aortic aneurism, aortic dissection, acute urinary retention and ascites. The decision will be take on clinical judgment of Emergency Physician (EP) on the base of clinical history, physical examination and laboratory exams. An expert trained fellow will perform a Vscan bedside exam and the results will blinded to EP which will manage every patient on the base of clinical practice guidelines for each disease. Laboratory tests and radiologic exams (ultrasonography, X-ray, computed tomography) will be performed according to standard of care. EP will not take decisions on basis of results derived by Vscan examination.

At the end of the enrolment we will verify the agreement between clinical judgment, Vscan examination, others diagnostic tests and final diagnose.

**Results:** It seems to be a correlation between Vscan exam and standard diagnostic tests in patients with acute abdominal pain.

**Conclusions:** The final conclusions will be presented with the poster at the conference.

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**Topic:** ACUTE DISEASES MANAGEMENT

**Hidden pheochromocytoma unmasked by steroids administration in dea. Case report**

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**Background:** Diagnosticate pheochromocytoma (Phe) in Emergency Department (ED) is difficult, due above all to the infrequency of this lesion, and the unspecific manifestations, frequently overlapping with other syndromes. There are evidences of hidden Phes disclosed after administration of drugs properly utilized to treat several dysfunction. A very small number of cases have been related to administration of steroid drugs up to now.

**Methods:** Case Report.

**Results:** A M 63 yo patient (P), suffering from Hypertension, was referred to ED after multiple honey-bee stings with diffuse weal rash. Due to a known mild allergy to hymenopters, he had already self-administered oral steroids at home. At the first evaluation, transient disconfort, vomit, headache, and skin symptoms have already been regressed; haemodynamic data and EKG were normal. Because of the history of allergy, the P was admitted for clinical monitoring. After three hours the P betrayed of sweating, vomit, headache, palpitations and chest pain. Laboratory Tests were normal and EKG showed sinus tachycardia. X-ray showed impending pulmonary congestion. Sudden cardiopulmonary failure occurred. Quick onset of acute respiratory failure (pO2/FO2<100) and metabolic acidosis occurred, while run of ventricular tachycardia were noted upon severe sinus tachycardia. The P was first treated with diuretics, B-Blockers and NIMV in ER; Cardiac US was normal, FE conserved. No evidence of toxic or anaphylactic response to honey-bee poison. A diagnosis of mixed heart and lung failure was assumed and treatment with nitrate and methylprednisolone was planned. No clinical improvement was noted after treatment. Persistent respiratory failure forced to orotracheal intubation, and the P was admitted in the ICU. Multiple crisis of hypertension and severe tachycardia resistant to treatment occurred, and inadequacy of respiratory gas exchanges persisted inspite of MV. Resuscitative efforts were stopped after three days. The post-mortem examination stressed a hidden Phe.

**Conclusions:** We could find only 15 cases of symptomatic crisis in known or hidden Phe following administration of steroid drugs reported up to know. The way of administration seems not to be significant. The most common symptoms recorded are: nausea, vomit and chest pain, acute pulmonary oedema and heart failure, death. In the case reported, symptoms and clinical history seems to suggest one more symptomatic manifestation of hidden Phe with high probability of relation to steroids administration.
**Topic: BIOMARKERS IN ACUTE DISEASES**

Study of coagulation and platelet function in patients with infectious and non-infectious systemic inflammatory response syndrome (SIRS) in the emergency department (ED)

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**Background:** SIRS can match with numerous infectious or non-infectious conditions and is often characterized by early alterations of the clotting system and platelets, with major thrombotic and bleeding complications. Early identification of SIRS is a prime target and the application of point-of-care (POC) technologies would increase diagnostic effectiveness and speed. Aim of this work is to evaluate the diagnostic role of viscoelastic and aggregometric POC in patients with SIRS in the ED.

**Methods:** Thromboelastometry (Rotem®) is a viscoelastic method able to assess the whole coagulation process according to different activation pathways; Impedance Aggregometry (Multiplate®) evaluates global platelet function in response to different stimuli. 87 patients with clinical diagnosis of SIRS (34 sepsis, 26 severe sepsis/septic shock; 27 severe trauma with Injury Severity Score> 15) were enrolled in the study. Clinical and Lab values were recorded, together with Rotem® tests and Multiplate® tests.

**Results:** Patients with trauma (T) were compared to sepsis (S) and severe sepsis / septic shock (SS) patients, as well as group with non-infectious SIRS (T) to infectious SIRS (S + SS). A significant difference was observed in mean values of Intern clotting time (CT) between T, S and SS populations (p=0.031). Significant differences in the analysis of clot firmness (MCF and A10) in Extem (p=0.016) and Fibtem (p=0.0001) were observed among T, S and SS in favor of the latter. Rapidity of clot formation (α angle) was also significantly increased in the population with infectious SIRS in Extem and Aptom tests. Multiplate® analysis demonstrated a widespread tendency to hypo-aggregability in populations with infectious SIRS via ADP test (p = 0.005), COL test (p=0.001) and TRAP test, which also been shown distinguished (p=0.002) the group with severe sepsis/septic shock from others. Diagnostic accuracy of POC tests in discriminating infectious forms of SIRS was good and far superior to classical lab variables and clinical scores.

**Conclusions:** This work represents the first example of joint application of POC methods for the evaluation of plasma coagulation and platelet function in cases of infectious and non-infectious SIRS in the ED. Peculiar and early alterations of the coagulation system and platelet aggregation were observed in patients with sepsis, severe sepsis and septic shock, able to distinguish with good accuracy the infectious etiology of SIRS.

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**Topic: NEUROLOGICAL AND PSYCHIATRIC DISORDERS**

Psychopathology and HIV infection in the emergency department. Epidemiology and gender differences

G. Melis1, G. Pia2, I. Piras3, M. Tusconi1

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**Background:** The management of patients with HIV infection who have comorbidity psychiatric disorders, is a problem that arises relatively frequently in Emergency Departments.

**Methods:** This retrospective study aims to evaluate the characteristics of HIV-infected patients who have been admitted to an Emergency Department of Sardinia, Italy, in 2013. The sample was selected from triage by choosing as the main problem at the entrance a state of agitation and/or acute intoxication (n=1245) or other symptoms or disorders not defined at the time of access to the Emergency Department (n=12125).

**Results:** From an initial sample of 13370 patients, representing 38.8% of total accesses in ED (n=34468), has been selected a cohort of 216 cases with clinical history of HIV infection. The sample, analyzed by software SPSS 21.0 is composed of 170 males (78.7% of total, mean age=44.5 ±1.076, df=4.5) and 46 females (21.3% of total, mean age=44.5 ±1.076, df=4.5) (t=1.076, df=108.9, p=0.284), this data has been confirmed by the Mann-Whitney U test for independent samples (p=0.136). Regarding the associated psychiatric condition (25.5% of total sample), the 46.3% had mood disorders, the 38.9% psychotic disorders and the 14.8% anxiety disorders, with no significant gender differences (p=0.329). The analysis of the sample showed that 29.2% (m=26.4%, f=2.8%) declared drug abuse, while 70.8% (m=52.3%, f=18.5%) reported not to take any drugs (p=0.007). A concomitant infection with HBV and/or HCV was found in the anamnesis in 54.6% (m=44.9%, f=9.7%) of patients. Only in 24.5% of cases (n=53) was administered a drug treatment in urgency (Pre-Hospital/ED) and an admission to hospital was necessary in 34.3% of the total sample analyzed. Among the admissions, in 70.4% has been decided for a department of infectious diseases, and of these, only 54.4% had already at the entrance to the Emergency Department signs of acute infection (fever, pneumonia, etc). The poor patient compliance often
makes it difficult to manage, as the analysis of the data shows, so that 16.2% of patients (n=35) appeared to be gone from the emergency room before physical examination or have completed the expected diagnostic process.

**Conclusions:** From these data show the predominant role of emergency departments in the management of a complex disease such as HIV infection, aggravated by the state of emergency and comorbidity with mental illness.

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**Topic: NEUROLOGICAL AND PSYCHIATRIC DISORDERS**

**Mental disorders in emergency in elderly and adolescents**

G. Melis1, G. Pia2, G. Iasiello1, I. Piras2, M. Loche1, **M. Tusconi**3

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**Background:** The management of patients with psychiatric issues is different depending on the age of the individual. The geriatric patient in the emergency room is a patient that appears to be complex, both for the multiple problems from which is often affected by, than to the difficulty in collecting an adequate history in a little time. Psychiatric disorders and acute intoxications represent a problem difficult to manage especially if they relate to the adolescent years.

**Methods:** The study aimed to assess the epidemiology of dementia and psychiatric illnesses and poisonings in adolescents in emergency. All data analysis was performed using SPSS software (SPSS, Inc., Chicago, IL).

**Results:** The 46.3% of the total ER was transported by ambulance with volunteers, 39.5% occurred independently, while 10% (n=96) came on ambulance with physician (p=0.009). The sample is analyzed on the basis of gender, had a diagnosis of anxiety disorder in 13.7% of cases; Bipolar disorder in 16.5%, psychosis in 27.7% (p<0.001), depression in 17.1% (p=0.004). For the 11.2% of the patients it was necessary to carry out a drug treatment urgency (118/ER). The drugs taken are: psychoactive drugs 46.2%; alcohol 22.6%; mixed drugs and alcohol abuse 13.7% (p<0.001). Out of a total sample 117 were classified as attempted suicide or expressed suicidal ideation. This sample, representing 0.34% of total accesses, is composed of 74 males (mean age 41.9±11.8) and 43 females (mean age 51.5±12.4) (p=0.001). The statistical analysis based on gender showed that 40.2% of the sample is affected by depression (m=53, f=17) (p=0.001), 17.9% Bipolar Disorder (m=11, f=10) (p=0.254) and 17.2% Psychosis (m=19, f=1) (p=0.001). Anticonservative behaviours required pharmacological treatment in emergency in the 10.3% of cases, while in 46.2% of cases it has been necessary to be admitted to the hospital ward.

**Conclusions:** From the analysis of the sample shows that the management of people with psychiatric problems appears to be very complex especially for the young and old patients.

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**Topic: NEUROLOGICAL AND PSYCHIATRIC DISORDERS**

**Management and epidemiology of mental disorders in emergency**

G. Melis1, G. Pia2, I. Piras2, **M. Tusconi**1

1Local Health Unit No. 1, Sassari, Italy, 2Emergency Department Holy Trinity Hospital Local Health Unit, Cagliari, Italy, 3Department Of Public Health, Clinical And Molecular Medicine - Section Of Psychiatry, University Of Cagliari, Cagliari, Italy

**Background:** Access to emergency services by patients in a state of agitation and its management, appears to be a complex problem characterized by many aspects. Aims of this study was to assess the management of the state of agitation in a Emergency Room (ER).

**Methods:** The total sample analysed includes 3468 patients. In 2013 at an emergency room of Sardinia, were 958 (2.8 % of the total), the main problem with access to the 'state of agitation'. Retrospective analyses were performed on data on access to the Emergency Department for the years 2012 and 2013; the reference population are outpatients with intoxication reported as the main problem. The sample includes patients of all ages with acute intoxication by psychoactive drugs and abuse of drugs (psychoactive drugs and alcohol). All data analysis was performed using SPSS software (SPSS, Inc., Chicago, IL).

**Results:** The 46.3% of the total ER was transported by ambulance with volunteers, 39.5% occurred independently, while 10% (n=96) came on ambulance with physician (p=0.009). The sample is analyzed on the basis of gender, had a diagnosis of anxiety disorder in 13.7% of cases; Bipolar disorder in 16.5%, psychosis in 27.7% (p<0.001), depression in 17.1% (p=0.004). For the 11.2% of the patients it was necessary to carry out a drug treatment urgency (118/ER). The drugs taken are: psychoactive drugs 46.2%; alcohol 22.6%; mixed drugs and alcohol abuse 13.7% (p<0.001). Out of a total sample 117 were classified as attempted suicide or expressed suicidal ideation. This sample, representing 0.34% of total accesses, is composed of 74 males (mean age 41.9±11.8) and 43 females (mean age 51.5±12.4) (p=0.001). The statistical analysis based on gender showed that 40.2% of the sample is affected by depression (m=53, f=17) (p=0.001), 17.9% Bipolar Disorder (m=11, f=10) (p=0.254) and...
17.2% Psychosis (m=19, f=1) (p=0.001). Anticonservative behaviours required pharmacological treatment in emergency in the 10.3% of cases, while in 46.2% of cases it has been necessary to be admitted to the hospital ward.

**Conclusions:** According to the study, it is clear the central role of ER in diagnostic and treatment of patients with mental illnesses and their management and transfer to the most appropriate structure.

**Topic: TRAUMA AND MAXI EMERGENCIES**

**Management of pain in femoral fractures in the elderly in the emergency department**

G. Melis¹, G. Pia², I. Piras², M. Tusconi³  
¹Local Health Unit No. 1, Sassari, Italy, ²Emergency Department Holy Trinity Hospital Local Health Unit, Cagliari, Italy, ³Department Of Public Health, Clinical And Molecular Medicine - Section Of Psychiatry, University Of Cagliari, Cagliari, Italy

**Background:** Pain is the main symptom observed in the emergency room; despite this, patients do not receive optimal management in emergency departments around the world, as amply demonstrated in the scientific literature available.

**Methods:** The aim of this study was to evaluate the epidemiology and treatment of pain in femoral fractures in the elderly first level Department of Emergency. All data analysis was performed using SPSS software (SPSS, Inc., Chicago, IL).

**Results:** Out of an initial sample of 9850 patients, aged 65 years, who have had access to an emergency Department in Sardinia, Italy, in 2013 (28.6% of total) were selected 209 cases that had a discharge diagnosis of femoral fracture. Based on the statistical analysis, the mean age of the patients was found to be 82.8±7.6 years, with a minimum age of 65 years and a maximum recorded age of 103 years, and about the gender, 25.8% were males (n=54) and 74.2% females (n=155). The patient has been transported to the ER by volunteers ambulance in 90.4% of cases (n=189). The code assigned to the triage was Yellow in almost all of cases (n=202), and despite the patient experiences pain at the entrance, this has not been quantified with appropriate scales. In 66.3% of cases the trauma occurred at home with a prevalence for females (75.9%) than males (24.1%). Regarding the timing of patient management has been able to record a mean time between triage and take-over by the doctor of 29.3±38.6 minutes and a time of 96.3±66.6 between triage and discharge. Pain therapy was administered in 12.0% of cases: in 72.0% of patients were used NSAIDs, paracetamol in the 16.0 %, and in the remaining 12.0% were used opioids. An analysis of the treatment based on gender has detected a statistically significant difference (p=0.03) for which the patients were males in 8.0% of cases and in 92.0% females, as likely to be correlated to the increased representation in our study of sample of women than men.

**Conclusions:** Based on these results it is necessary to carry out an awareness-raising for the treatment of pain in emergency departments and especially in the short term to create a protocol for pain therapy for elderly patients with femoral fracture.

**Topic: BIOMARKERS IN ACUTE DISEASES**

**Research proposal: risk scores, biomarkers and multidimensional evaluation in heart failure prognostic stratification: multiparametric assessment of prognosis in heart failure: (MAP-HF) – study design**

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¹1st Cardiology/C.C.U. Unit, Cardiovascular Department, San Camillo Hospital, Rome, Italy, ²2nd Cardiology Unit, Department Of Cardiology, San Giovanni Hospital, Rome, Italy, ³Cardiovascular Center And University, Trieste, Italy, ⁴Heart Failure Clinic, Division Of Cardiology, San Martino Hospital, Belluno, Italy, ⁵Heart Failure Clinic, Division Of Cardiology, Villa Bianca Hospital, Trento, Italy

**Background:** Heart failure (HF) has increased its prevalence in general population to epidemic proportions, being one of the first cause of mortality, hospital admissions and disability, despite optimal medical and device therapy. The individual patient prognostic assessment is difficult and unreliable because of the heterogeneity of the disease. Hence an affordable prognostic stratification represents the point for targeting patients in disease management programs and for the appropriate selection of the model of care. MAP-HF is a pilot multicentric, observational, prospective study aimed at evaluating the role of instrumental variables, risk scores, biomarkers and multidimensional assessment (cognitive status, frailty, quality of life) in assessing prognostic predictors of HF patients with different aetiologies and clinical profiles in common practice.
Clinical, instrumental and laboratory examinations scheduled in MAP-HF Study:

<table>
<thead>
<tr>
<th></th>
<th>Baseline T0</th>
<th>Follow-up 1m T1</th>
<th>Follow-up 3m T3</th>
<th>Final 12m T12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical history</td>
<td>X</td>
<td>X (update)</td>
<td>X (update)</td>
<td>X</td>
</tr>
<tr>
<td>Physical examination</td>
<td>X</td>
<td>x</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>ECG</td>
<td>X</td>
<td>x</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Laboratoristic evaluation BNP ST2</td>
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<td>X</td>
<td>X</td>
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<td>6 min WT (+4mwt)</td>
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<td>X</td>
<td>X</td>
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<td>HRV Holter**</td>
<td>X</td>
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<td>Events</td>
<td>X</td>
<td>x</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>EuroQOL</td>
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<tr>
<td>Echocardiogram</td>
<td>X</td>
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<td>X</td>
<td>X</td>
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<tr>
<td>FE, E/E', IM (ERO), TAPSE</td>
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<td>X</td>
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<td>ADL-IADL*</td>
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<td>X</td>
</tr>
<tr>
<td>MOCA*</td>
<td>X</td>
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<td>X</td>
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</table>

Methods: MAP-HF is designed as a cohort longitudinal study with a planned inclusion of at least 350 consecutive outpatients of 50 years or older, diagnosed with stable CHF (NYHA class II-IV) basing on ESC guidelines. Inclusion criteria are: EF > 40% at recruitment, BNP > 100 pg/ml and/or a previous hospitalization for HF. Exclusion criteria are: recent myocardial infarction (< 1 month) or acute decompensated HF (< 3 months), dementia or psychiatric diseases, previous stroke, active cancer, hemodialysis, life expectancy < 1 year, HF due to alcoholic or peripartum cardiomyopathy or tachycardiomyopathy. All patients will undergo at baseline and 12 months follow-up a complete clinical and instrumental evaluation including NYHA class, Seattle HF and 3-CHF scores, EuroQOL score, 6-minute walk test, 4-meter walk test, echocardiogram, BNP and ST2 plasma levels dosage and, for patients aged > 70y, a self-sufficiency and independence assessment with BADL and IADL scales and cognitive status with MiniCog screening test and MOCA. At 1 and 3 months from recruitment all patients will undergo a clinical and laboratory follow-up. MAP-HF complies with the Declaration of Helsinki and informed consent will be obtained from patients.

Results: The primary endpoint is death of any cause; secondary outcomes are cardiovascular death, non-cardiovascular death, HF hospitalizations, hospitalizations not related to HF, functional impairment as a lower score in ADL-IADL scales in patients aged > 70 years. Univariate and multivariate statistical analyses (Kaplan-Meier and Cox proportional hazards survival regression analysis) will be used to examine the impact of single variables in determining pre-specified primary and secondary outcomes. The accuracy of the logistic regression models will be evaluated by C-statistic.

Topic: CARDIOVASCULAR CRITICAL CARE MEDICINE

Elevated plasma levels of N-terminal pro-brain natriuretic peptide observed in both clinical and pathophysiological settings in patients with asymmetric hypertrophic cardiomyopathy

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¹Clinic For Cardiology, Clinical Center Of Serbia, Belgrade, Serbia, ²Clinic Of Endocrinology, Diabetes And Metabolic Disorders, Clinical Center Of Serbia, Belgrade, Serbia, ³Department Of Medical-Surgery Sciences And Translational Medicine, La Sapienza University, Sant’andrea Hospital, Rome, Italy

Background: N-terminal pro-brain natriuretic peptide (NT-pro-BNP) is excellent marker of abnormal left ventricular (LV) wall stress, but may also result from ischemia. In patients with hypertrophic cardiomyopathy (HCM) ischemia is common finding due to microvascular dysfunction which is reflected by decreased coronary flow reserve (CFR). Extravascular compressive forces due to elevated LV filling pressure, LV wall stress and significant left ventricular outflow tract gradient (LVOTG) might additionally worsen ischemia. Ratio of early transmitral flow velocity to early diastolic lateral mitral annulus velocity (E/e’) has been shown to be accurate noninvasive predictor of elevated LV filling pressure. The aims of this study are to: 1. analyze values of plasma concentrations of NT-pro-BNP in various clinical and echocardiographic features in HCM patients; 2. explore possible relation between plasma levels of NT-pro-BNP with microvascular function and extravascular compressive forces. Methods: In 61 patients (mean age 49±16 years; 26 male) with asymmetric HCM (20 patients with significant LVOTG and 41 patients without obstruction) plasma levels of NT-pro-BNP were obtained. The NT-proBNP level was analyzed by electrochemiluminescence immunoassay technique (ECLIA, Roche Diagnostics). Standard transthoracic examination with measurement of CFR in LAD was done.
**Results:** Mean natural logarithm value of NT-proBNP was 7.11±0.95pg/ml for the whole population. NT-proBNP was significantly higher in patients with NYHA II compared to NYHA I (p=0.003), while the levels were not statistically different in patients with or without angina, syncope and heart rhythm abnormalities. Values of NT-proBNP were significantly higher in obstructive compared to the non-obstructive HCM (p=0.021), in moderate compared to mild mitral regurgitation (p=0.003), in increased left atrial volume index (LAVI) compared to normal LAVI (p=0.011), in the presence of diastolic dysfunction (p<0.001) and in decreased CFR (p<0.001). Levels of NT-proBNP correlated with the ratio of E/e'(r=0.534, p<0.001), LAVI (r=0.443, p<0.001), LVOTG (r=0.503, p=0.024), while inversely correlated with CFR LAD (r=−0.569, p<0.001).

**Conclusions:** Plasma levels of NT-ProBNP are significantly higher in obstructive HCM, patients with NYHA II, moderate mitral regurgitation, diastolic dysfunction, enlarged LAVI and decreased CFR. Extravascular compressive forces such as the presence of significant LVOTG and elevated filling pressure additionally increase levels of NT-proBNP. Also microvascular dysfunction might further increase NT-proBNP. Thus, elevated NT-proBNP does not only reflect LV wall stress but might also be result of cardiac ischemia.

**Topic: CARDIOVASCULAR CRITICAL CARE MEDICINE**

Heart failure with preserved and reduced left ventricular ejection fraction - from hospital presentation to outcome

B. Stojcevski1, V. Celic1,2, B. Pencic-Popovic1, A. Majstorovic1, A. Sljivic1

1University Clinical Hospital Center Kbc Dr Dragisa Misovic- Dedinje, Cardiology Department, Belgrade, Serbia, 2Faculty Of Medicine, University Of Belgrade, Belgrade, Serbia

**Background:** Heart failure with preserved left ventricular ejection fraction (HFpEF) (LVEF) is a matter of growing interest, due to insufficient data about its characteristics and outcomes. The aim of this study was to investigate the differences in hospital presentation and long term survival between acute heart failure (AHF) patients (pts) with HFpEF, and reduced LVEF (HFrEF).

**Methods:** We included 168 patients (pts) (mean age 72±8.3 years, 60.1% male) hospitalized due to AHF. Routine laboratory measures and physical examination were done at presentation. LVEF was measured by standard two-dimension echocardiography. HFpEF was defined as HF with LVEF>45%. Based on LVEF, pts were divided in two groups: Group I (HFrEF; 70.2%) and Group II (HFpEF). The outcome of interest was death during one year after hospitalisation.

**Results:** Mean LVEF was 32.2% in Group I, and 51.9% in Group II (p=0.001). There were no differences between groups with regard to: age, clinical presentation (New York Heart Association- NYHA Class, heart rate, peripheral oedema, rales, hepatomegaly, diastolic arterial tension), presence of comorbidities (arterial hypertension, atrial fibrillation, chronic kidney failure, diabetes mellitus, chronic obstructive pulmonary disease), tobacco use, HF etiology, de-novo AHF rate. Pts with HFrEF had higher systolic tension (146.2 vs. 137.3mmHg, p=0.029) and lower haemoglobin (116.4 vs. 129g/l, p=0.001). HFrEF was associated with male gender (83.2 vs. 62.7%, p=0.003), higher end-diastolic diameter (EDD) (62.3 vs. 54.8mm, p<0.001), N-terminal brain natriuretic prohormone (NT-proBNP) (7442.2 vs. 5212pg/ml, p=0.007), bilirubin (20.9 vs. 16.3umol/l, p=0.041), aspartat and alanin transaminase (61.2 vs. 34.7 IU/l, p=0.046), gamma-glutamyl transferase (101.5 vs. 59.1 IU/l, p=0.003), alcohol use (86.4 vs. 71%, p=0.004). Other laboratory parameters were similar in both groups. All pts were similarly treated after hospitalization, except for calcium channel blockers, which were more used in Group II (32.4 vs. 15.1%, p=0.019). Forty-one patient died during one year follow up (28.5%) and 24 were lost. LVEF wasn't associated with the one year death event, and pts from both groups had similar outcome risk (p=0.137).

**Conclusions:** At hospital presentation, patients with HFrEF are usually men with higher NT-proBNP, liver enzymes and EDD, comparing to HFpEF patients who only show higher systolic arterial tension. Despite this presentation differences end echocardiographic measures, long term outcome of HFrEF is as poor as for HFpEF.

**Topic: ACUTE DISEASES MANAGEMENT**

Frailty syndromes for risk prediction in the elderly: a prospective observational study

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Imperial College London, Department Of Medicine, London, United Kingdom

**Background:** The assessment and management of older patients in acute care is a pressing challenge in acute care. Existing frailty scales have demonstrated poor predictive power within this setting. We have previously shown the utility of Frailty Syndromes (Cognitive impairment, reduced mobility, falls, incontinence, anxiety/depression, pressure sores) for risk prediction within a national (England) retrospective administrative data (GREAT VII). We report a prospective trial of this model in the clinical setting.

**Methods:** Prospective observational study of patients over 65 years with acute medical admission via the Acute Medical Unit in a Central London Teaching Hospital by convenience sampling between June to November 2013 (6m). Data collected include demographics, presentation, co-morbidity, prescriptions, medical and nursing assessments and outcomes (inpatient mortality, 7 & 30 Day emergency readmission.
Frailty syndromes were coded (New/Active and Historic). Logistic regression was used to build the risk model and Receiver Operator Characteristic (ROC) curves to assess predictive power.

**Results:** 482 patients were recruited where frailty syndromes were common (Table 1). 3 models were created: Historic Frailty Syndromes, New/Active Frailty Syndromes and Frailty Syndromes + (Table 2). There was mild improvement for predictive power between coding for new or active frailty syndromes compared with the historic model. The addition of routinely collected clinical data to frailty syndromes improves risk prediction to thresholds of clinical utility (>0.80) (Table 3).

**Conclusions:** Improvement in predictive power from historic to new/active frailty syndromes may suggest that a clinical deterioration (from baseline) is more predictive in frailty syndromes than just the presence of one. For clinical utility, other routinely collected variables can improve the utility of frailty syndromes for risk prediction in patients over 65 requiring acute medical admission. The addition of biomarkers may further improve risk stratification and should be explored.

<table>
<thead>
<tr>
<th>Variables</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age(years)</td>
<td>81.5(65.1-103.6)</td>
</tr>
<tr>
<td>Gender</td>
<td>312(64.7%) female</td>
</tr>
<tr>
<td>Mean Charlson Score</td>
<td>2.23(0-11)</td>
</tr>
<tr>
<td>Mean admission NEWS score</td>
<td>2.13(0-14)</td>
</tr>
<tr>
<td>NEWS 0-4</td>
<td>397(82.4%)</td>
</tr>
<tr>
<td>NEWS 5-6</td>
<td>58(12.0%)</td>
</tr>
<tr>
<td>NEWS &gt; 7</td>
<td>27(5.6%)</td>
</tr>
<tr>
<td>Mean number of previous admissions in previous 6m</td>
<td>10(0-10)</td>
</tr>
<tr>
<td>ADLs With at least 1 deficit</td>
<td>205(42.5%)</td>
</tr>
<tr>
<td>Dependant for Washing</td>
<td>175(35.7%)</td>
</tr>
<tr>
<td>Dependant for Dressing</td>
<td>162(33.6%)</td>
</tr>
<tr>
<td>Dependant for Cooking</td>
<td>196(40.7%)</td>
</tr>
<tr>
<td>New/Active Cognitive Impairment</td>
<td>155(32.2%)</td>
</tr>
<tr>
<td>New/Active Falls</td>
<td>133(27.6%)</td>
</tr>
<tr>
<td>New/Active Reduced mobility</td>
<td>130(27.0%)</td>
</tr>
<tr>
<td>New/Active Incontinence</td>
<td>155(32.2%)</td>
</tr>
<tr>
<td>New/Active Pressure Sores</td>
<td>42(8.7%)</td>
</tr>
<tr>
<td>New/Active Nutrition risk</td>
<td>112(23.2%)</td>
</tr>
<tr>
<td>Historic Anxiety and/or depression</td>
<td>151(31.3%)</td>
</tr>
<tr>
<td>Mean number of medications</td>
<td>9(0-24)</td>
</tr>
<tr>
<td>Polypharmacy (&gt;5 medications)</td>
<td>328(68.8%)</td>
</tr>
<tr>
<td>Historic Cognitive Impairment</td>
<td>86(27.8%)</td>
</tr>
<tr>
<td>Historic Falls</td>
<td>198(42.1%)</td>
</tr>
<tr>
<td>Historic Reduced mobility</td>
<td>25(5.2%)</td>
</tr>
<tr>
<td>Historic Incontinence</td>
<td>50(10.4%)</td>
</tr>
<tr>
<td>Inpatient Mortality</td>
<td>34(7.1%)</td>
</tr>
<tr>
<td>7 Day emergency readmission</td>
<td>33(6.8%)</td>
</tr>
<tr>
<td>30 Day emergency readmission</td>
<td>85(17.6%)</td>
</tr>
<tr>
<td>Institutionalization</td>
<td>54(11.2%)</td>
</tr>
</tbody>
</table>

**Table 2 Variables for frailty syndrome risk prediction models for inpatient mortality**

<table>
<thead>
<tr>
<th>Historic Frailty Syndromes</th>
<th>New/Active Frailty Syndromes</th>
<th>Frailty Syndromes +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Age</td>
<td>Age</td>
</tr>
<tr>
<td>Number of admission in past 6m</td>
<td>Number of admission in past 6m</td>
<td>Number of admission in past 6m</td>
</tr>
<tr>
<td>Gender</td>
<td>Gender</td>
<td>Gender</td>
</tr>
<tr>
<td>Historic Cognitive Impairment</td>
<td>New/Active Cognitive Impairment</td>
<td>New/Active Cognitive Impairment</td>
</tr>
<tr>
<td>Historic Reduced mobility</td>
<td>New/Active Reduced mobility</td>
<td>New/Active Reduced mobility</td>
</tr>
<tr>
<td>Historic falls</td>
<td>New/Active falls</td>
<td>New/Active falls</td>
</tr>
<tr>
<td>History of incontinence</td>
<td>New/Active incontinence</td>
<td>New/Active incontinence</td>
</tr>
<tr>
<td>History of anxiety and/or depression</td>
<td>Historic anxiety and/or depression</td>
<td>New/Active Pressure Sores</td>
</tr>
<tr>
<td>New/Active Pressure Sores</td>
<td>New/Active Pressure Sores</td>
<td>New/Active Pressure Sores</td>
</tr>
<tr>
<td>Polypharmacy (&gt;5 medications)</td>
<td><strong>Weight below average?</strong></td>
<td>Polypharmacy (&gt;5 medications)</td>
</tr>
<tr>
<td><strong>Poor oral intake?</strong></td>
<td>Administration NEWS Score</td>
<td><strong>Poor oral intake?</strong></td>
</tr>
<tr>
<td>ADL deficit</td>
<td>(count of 3 washing, dressing, cooking)</td>
<td>ADL deficit</td>
</tr>
</tbody>
</table>

**Table 3 Area Under Receiver Operator Characteristic Curves for frailty syndrome models**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Historic Frailty Syndromes model</th>
<th>New/Active Frailty Syndromes model</th>
<th>Frailty Syndromes + model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient mortality</td>
<td>0.71</td>
<td>0.79</td>
<td>0.92</td>
</tr>
<tr>
<td>7 Day readmission</td>
<td>0.79</td>
<td>0.78</td>
<td>0.82</td>
</tr>
<tr>
<td>30 Day readmission</td>
<td>0.756</td>
<td>0.758</td>
<td>0.78</td>
</tr>
<tr>
<td>Institutionalization</td>
<td>0.657</td>
<td>0.698</td>
<td>0.75</td>
</tr>
</tbody>
</table>
Topic: BIOMARKERS IN ACUTE DISEASES

Diagnostic performance of hs-TnT and poct-tnt in clinical routine

A. Slagman¹, J. Searle¹, J. Von Recum¹, F. Holert¹, D. Meyer-Zum-Büschenfelde¹, C. Müller², M. Möckel¹
¹Department Of Cardiology, Division Of Emergency Medicine Cvk, Ccm; Charité University Medicine, Berlin, Germany, ²Department Of Laboratory Medicine And Clinical Chemistry; Charité University Medicine, Berlin, Germany

Background: NSTEMI is defined as a rise and/or fall of cardiac troponin with at least one value above the 99th percentile of a healthy reference population in patients with signs or symptoms of acute ischemia. The cut-off value used is recommended to have a coefficient of variation of less than 10%. Point of care (POC)-systems do usually not meet these criteria at the 99th percentile.

In this analysis, the diagnostic performance of a POC-test for TnT in the ED is compared to the high-sensitive TnT test performed in the hospital central laboratory.

Methods: All patients with routine troponin T (TnT) testing in the Emergency Department (ED) were enrolled (n=4,946). TnT was measured simultaneously: contemporary sensitive in EDTA whole blood on the AQT 90 (Radiometer – contemporary sensitive) and high sensitive in heparin plasma on the Cobas 602 (Roche analytical systems). Only internal patients (n=4,304) with both Troponin measurement (n=3,396) were analyzed. Patients with STEMI were excluded from analysis (n=33). The diagnostic performance was statistically analyzed at two different cut-offs for each Tn-test: hsTnT at 14ng/L and 50ng/L and AQT-TnT at 16ng/L and 30ng/L. Endpoint was the hospital main diagnoses at discharge.

Results: Of all 3,423 patients with suspected NSTE-ACS, 57.2% were male (n=1,959) and the median age was 61 years (IQR: 45-73). 7.8% had a final diagnosis of unstable angina pectoris (UAP; n=267) and 3.6% had NSTEMI (n=124). A coronary angiography (CA) was performed in 10.4% (356) and PCI was required in 42% of patients with CA (n=149). For the high-sensitive TnT assay, 28.4% and for the AQT-TnT-assay, 75.7% of all values were at or below the lower limit of detection. The diagnostic performance of the respective TnT-assays at different cut-offs is shown in table 1.

Conclusions: In our cohort the diagnostic performance of conventional POC-testing at admission was comparable to hsTn. HsTnT in clinical routine provides information about slightly elevated Tn-values which might be of added prognostic value and for shorter diagnostic evaluation. The implementation of a 99th percentile cut-off is accompanied by a major decrease in specificity, PPV and overall accuracy while NPV only increases slightly, thus challenging the clinical benefit.

Topic: TRAUMA AND MAXI EMERGENCIES

Ceus in low energy isolated abdominal trauma: a retrospective case-series study

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Background: Contrast-enhanced ultrasound (CEUS) has an high accuracy in the detection of abdominal traumatic lesions. In this study we evaluate the sensibility of CEUS in the identification and grading of abdominal traumatic lesions in patients with low-energy isolated abdominal trauma in comparison with baseline-ultrasound (US) and contrast-enhanced computed tomography (CE-MDCT), considered the gold standard.

Methods: A total of 128 consecutive patients who arrived in our Emergency Department between January 2008 and December 2012 (78 males, 50 females, 4-82 years, mean age 35 years), with a history of low-energy isolated abdominal trauma were analyzed. All patients underwent US, CEUS with the use of a second-generation contrast agent (Sonovue, Bracco-Milan, Italy) and MDCT. The sensibility (SE) in the detection of lesions for US and CEUS and in the grading of lesions for CEUS was calculated comparing with CT findlings, according with the AAST criteria.

Results: CE-MDCT identified 62 abdominal traumatic lesions (liver=14, spleen=17, Kidney=11). US and CEUS depicted respectively 25/62 and 40/62 traumatic injuries. Sensibility for the identification of traumatic abdominal lesions were 59% for US and 96% for CEUS. CEUS had successfully staged 36/62 traumatic lesions with a sensibility of 88%. 

<table>
<thead>
<tr>
<th>Cut-off</th>
<th>hsTnT</th>
<th>AQT-TnT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>92.74</td>
<td>86.29</td>
</tr>
<tr>
<td>Specificity</td>
<td>67.08</td>
<td>85.54</td>
</tr>
<tr>
<td>PPV</td>
<td>9.58</td>
<td>18.32</td>
</tr>
<tr>
<td>NPV</td>
<td>99.59</td>
<td>99.40</td>
</tr>
<tr>
<td>Accuracy</td>
<td>68.01</td>
<td>85.57</td>
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</tbody>
</table>
Conclusions: In patients with low-energy isolated abdominal trauma US should be replaced by CEUS as the first line approach, showing a high sensibility both in the detection and grading. CE-MDCT must always be performed in CEUS positive patients to exclude active bleeding and urinomas.

**Topic: CARDIOVASCULAR CRITICAL CARE MEDICINE**

**Non invasive detection of arrhythmogenic myocardium**

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**Background:** Sudden cardiac death occurs in 1/3 to half of patients with chronic heart failure (HF); As shown by multicentre studies such as COMPANION and DEFINITE, the cardioverter-defibrillators (ICD) have important impact in reducing both mortality and hospitalization rate in patients with symptomatic HF, irrespective of the nature of cardiomyopathy. Of course, if all the patients with HF and potential arrhythmia would have placed an ICD, the costs for every health care system would be extremely high. 1-123 meta-iodo-benzylguanidine (MIBG), a radiolabelled norepinephrine analogue is able to image the bio-distribution of the function of the autonomic nervous system. Failure in nervous afference to viable myocardium is an important factor in triggering and sustaining a variety of malignant ventricular arrhythmias. Thus scintigraphy with MIBG can take on an important role in selecting patients who would benefit from ICD by identifying those at increased risk for potentially fatal arrhythmias. In this study we evaluated if integration between perfusional, vitality and adrenergic innervation imaging in patients with ICD could help in identifying arrhythmogenic foci and selecting candidates for ICD placement.

**Methods:** After having studied 3 patients scheduled for PET and 99mTc-Sestamibi (MIBI) studies for non cardiac reasons, we enrolled 10 patients in whom Parkinson disease was excluded, with left ventricular dysfunction, EF<35%, and previously implanted ICD for primary or secondary prevention. All patients underwent rest planar scan and early-late single photon emission tomography (SPECT) with 123I-MIBG plus rest GATED SPECT imaging with 99mTc MIBI and PET/CT imaging with the viability tracer fluorodeoxyglucose (18F-DFG). Patients were followed up for at least six months.

**Results:** Normal patients did not show mismatches The EF measured by gated SPECT was 25.6, SD 3.6. All the patients who showed mismatch between MIBG and MIBI showed also mismatch between MIBG SPECT and DFG PET. Two patients did not show MIBI-MIBG mismatch but showed mismatch between MIBG and DFG. The patients who showed mismatches experienced ICD discharges during the follow-up, whereas the 2 patients without mismatch did not.

**Conclusions:** The analysis of mismatch zones between MIBG SPECT and MIBI SPECT and/or DFG PET is an accurate non invasive method to discover arrhythmogenic myocardium. DFG PET is more expensive but also more sensitive to this end.

**Topic: THE HEALTH-SOCIAL ROLE OF EMERGENCY MEDICINE**

**Importance of Legal Advice in an Emergency Department**

P. Schinco¹, R. Arione¹, A. Cibelli², G. Manzoli², C. Fini²
¹Direzione Sanitaria Presidio Molinette- Aou Città Della Salute e Della Scienza, Torino, Italy, ²Centro Supporto Vittime Di Violenza - Aou Città Della Salute e Della Scienza, Torino, Italy

**Background:** Demonstrate the importance of legal advice in an emergency department. In the specific case is given the experience of the Centre Support and Listening Victims of Demetra to the Hospital of Turin - City University of Health and Science of Turin, where some operators volunteers (employees of the company lawyers or law graduates with specific expertise in the field) in 2007 make a legal advice service to victims.

**Methods:** The legal advice is carried out in two ways: 1) immediate action on call in the emergency room which is facing the victim of violence; 2) appointment with the subject that will appeal to the Centre. In both cases, the subject is informed of his rights (period for bringing any lawsuit, conditions for access to free legal aid) and possible criminal justice initiatives and civil legal action to be taken.

**Results:** The victims of violence are reassured and strengthened having become more aware of their rights and of the initiatives to be undertaken without downtime and loss of energy. Where possible, these are in fact addressed to institutional bodies with specific training and expertise as well as when they wish to contact an attorney shall be informed of the existence of 'register kept by the Council of the BAR.

**Conclusions:** The service provided by the Legal Advice Service Centre Demetra gave positive feedback with a high index of satisfaction of users and approval by the health workers of the emergency department who are relieved of a task which sometimes do not feel adequate. The provision of advice by those who, given their status as civil servants, however, could not plead in its victims, helps them to externalize their feelings more freely and fears resulting from the establishment of judicial actions and receive a legal opinion released from any future actions.
Topic: THE HEALTH-SOCIAL ROLE OF EMERGENCY MEDICINE

Intimate Partner Violence in Emergency Room

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Direzione Sanitaria Presidi Molinette/Sgas-Aou Citta Della Salute E Della Scienza, Torino, Italy

**Background:** Receiving Intimated Partner Violence (IPV) victims in Emergency Room is a relatively common occurrence for the medical staff, who is however rarely willing to intervene effectively. Important issues are often not tackled, sequelae are not considered and the experience of the victims themselves is minimised with a serious impact on their mental health, including removal from further health proceedings.

**Methods:** When the Triage nurse suspects a case of IPV (Intimate Partner Violence) applies the standard procedure by making a clinical evaluation and initial assigns a priority code adequate to reduce excessive waiting time and will ensure the maximum level of privacy inside the ER. He/Her will ask question tactfully, will has a reassuring attitude by being open and willing to listen. The nurse will immediately alert all the relevant services available at the time. The nurse will inform the doctor and services involved in managing such cases. The health personnel may use techniques of counselling to people who have been victims of IPV that occur in the Emergency Room. The nurse guides and encourages the patient to seek out of the various support options available, enhancing her ability to cope with stress and to make her own choices among various options. The presence of health personnel that uses techniques of counselling from the first moment is part of an overall care strategy for the benefit of the patient and any family members who may be involved. Environmental, physical, psychological, relational and communication factors are taken in consideration.

**Results:** We have treated 259 cases of IPV in 2013. 103 of which accepted an interview counselling. 63 victims have welcomed a second intervention counseling after the visit and the first interview (24.3 % of all cases and 61.1% of those who did the first).

**Conclusions:** We believe that this approach can reduce the underestating of the phenomenon IPV by improving the quality of care and adherence support programs for victims of violence. This approach provides for rapid access to a psychic examination of an ER of measurable symptoms as tremor, anxiety, fear, dizziness, dissociative amnesia, reticence, flashbacks and symptom of arousal. It was accepted by a good part of patients. Reduces the exposure to stress of the health personnel.

Topic: TRAUMA AND MAXI EMERGENCIES

Integrated intervention in maxi-traffic accidents emergencies: a case study

N. Scala¹, P. Cestra²
¹Private, Rome, Italy, ²Italian Traffic Police, Rome, Italy

**Background:** Today Italian roads are witness of many traffic accidents, every two hours there is a fatality as result of an average of 590 traffic accidents occurring daily. Many of them involving several vehicles and a lot of people need operators who manage the accident. It is important to develop a strategy of early intervention, and an appropriate psychological support for rescuers to reduce in them the risk of Trauma and Stress Related (DSM V, 2013).

**Methods:** This paper aims to present operators’ work during an intervention carried out following the occurrence of an accident in which 40 people die.

The study is focused on the idea that operators can develop, in the near and distant future, aspects of Trauma and Stress Related Disorder or symptoms.

The model used is a cognitive behavioral (Clark, D.A., and Beck, A.T. 2011), able to reduce negative emotional and behavioral responses following a trauma. The protocol used is “Critical Incident Stress Management” (J. Mitchell, 1983, 1991). The processes are intended to help individuals manage their normal stress reactions to abnormal events. The protocol used foresees, for the 35 operator volunteers, a Defusing, immediately after the intervention, a Debriefing after 24 hours and a follow up after one and two months to check how the event influenced behavior and feelings of operators.

**Results:** This experience has demonstrated that when an integrated intervention occurs in maxi-traffic accident emergencies, Defusing, Debriefing (Solomon, Macy, 2003) and follow up after one and two months from the event, the percentage of Trauma and Stress Related Disorder, of 35 operators interviewed, using the Critical Incident Stress Debrifing (J. Mitchell, 1983, 1991) is minor than the percentage reported in other studies (W. Berger; F. Coutinho, L. Figueria, C.Marquez-Portella, M. Pires Luz, T. C. Neyland, C.R. Marmar, M.V. Mendlowicz, 2011;) where the average per entage of Post Traumatic Stress Disorder symptoms was of 10%, and the Acute Stress Disorder (C.S. Fullerton, R.J.Ursano, L. Wang, 2004) was 25,6%.
Conclusions: The work analyzes the intervention, as well as discrepancies, gaps, strengths and opportunities for discussion, in order to build dynamic evolution of the known for the improvement; it shows that a correct psychological approach to all rescuers involved, will ensure, a lower risk of trauma and psychopathology.

**Topic: BIOMARKERS IN ACUTE DISEASES**

Brain natriuretic peptide (BNP), neutrophil gelatinase-associated lipocalin (NGAL) and bioelectrical impedance vector analysis (BIVA) for the prediction of cardiovascular events in heart failure

S. Santarelli, V. Russo, B. De Berardinis, L. Lalle, H. Villacorta, S. Di Somma
1Emergency Department Azienda Ospedaliera Sant’Andrea, Faculty Of Medicine and Psychology Sapienza University, Rome, Rome, Italy
2Universidade Federal Fluminense, Departamento De Ciencias Cardiovasculares, Rio De Janeiro, Brazil, 3Emergency Department Azienda Ospedaliera Sant’Andrea, Faculty Of Medicine And Psychology Sapienza University, Rome, Rome, Italy

Background: Heart Failure is a chronic disease with high prevalence and with frequent relapses worldwide. For these reasons, acute heart failure (AHF) is a common leading cause of admission to Emergency Department and hospitalization. The aim of this study was to investigate about the ability of Brain Natriuretic Peptide (BNP), Neutrophil Gelatinase-Associated Lipocalin (NGAL) and peripheral congestion detected by Bioelectrical Impedance Vector Analysis (BIVA), to identify patients who are more likely to develop events in the upcoming 90 days.

Methods: This is an observational, prospective study performed in the Cardiology ward of Fluminense Federal University of Rio de Janeiro (Brasil), and in the Emergency Medicine Ward of Sant’Andrea Hospital in Rome (Italy). AHF patients performed BNP and NGAL measurements at arrival in the ward. BIVA was performed at discharge. A 90 days follow up phone call was made to evaluate cardiovascular events (death or rehospitalization).

Results: 295 patients were enrolled. BNP levels were higher in AHF patients with events (p < 0.01), and ROC curve showed that BNP had a prognostic role for rehospitalization at 90 days (AUC 0.59, p < 0.01). NGAL between the two groups was not statistically significant (p < 0.35) but ROC analysis showed its predictive role for death at 90 days (AUC 0.74, p < 0.01). Hydration Index (HY), Resistance (R), and reactance (Xc), showed statistical significant difference in patients with events vs no events (p < 0.001). At ROC analysis, BIVA showed high prediction for death: HY (AUC 0.712, p < 0.01), Xc (AUC 0.715, p < 0.001), R (AUC 0.65, p < 0.01).

Conclusions: In AHF patients, BNP allows to identify patients who will be readmitted before 90 days, while NGAL seems to identify patients at high risk of death. BIVA have a good prognostic value for total events and in particular for cardiovascular death.

**Topic: ACUTE DISEASES MANAGEMENT**

Role of point of care lung ultrasound and procalcitonin in the diagnosis of pneumonia in emergency department. Research proposal

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Emergency Department Azienda Ospedaliera Sant’Andrea, Faculty Of Medicine And Psychology Sapienza University, Rome, Italy

Background: Pneumonia is a common and potentially lifethreatening disease worldwide and it represents the first cause of mortality related to infectious diseases in western countries, and the major cause of sepsis and septic shock. Recently bedside lung ultrasound (LUS) and procalcitonin (PCT) have shown to be very useful tools for the emergency physician in the diagnosis of pneumonia. The aim of this study proposal is to determine the diagnostic accuracy of LUS and PCT combined and alone for the diagnosis of pneumonia in the Emergency Department (ED).

Methods: Adult patients arriving to ED with a suspected diagnosis of pneumonia will be enrolled, during a period of one year. Each patient will receive the ordinary clinical practice care including blood exams (included PCT dosage), Chest-X ray and, when indicated, Thorax CT. In addition LUS will be performed, in the ED, for each patient by trained sonographers, and physicians will be blinded to its result.

Results: On the bases of our statistical preliminary analysis it is expected to enroll almost 300 patients.

Conclusions: LUS is expected to be a promising alternative to Chest-X ray, and its use combined with PCT blood levels could improve the diagnostic accuracy with consequent immediate decision making for the emergency physician useful both for treatment and for disposition of patients.
Pneumomediastinum in emergency department: is possible to adopt a conservative approach in selected patient?

M. Rossi1, C. Canetta1, G. Acquistapace1,2, D. Camisa2, C. Valcareghii1, P. Piccioni1, M. Buvoli1, A. Manelli1, G. Ricevuti1

1Pronto Soccorso Ospedale Maggiore Lodi, Lodi, Italy, 2Pronto Soccorso Ospedale Melegnano, Melegnano, Italy, 3Università Degli Studi Di Pavia: Medicina D’Emergenza-Urgenza, Pavia, Italy

Background: The term pneumomediastinum describe a pathologic condition characterized by the presence of air in the mediastinum; It is most commonly caused by oesophageal rupture (for example in Boerhaave syndrome) asthmatic attack or other conditions leading to alveolar rupture, but in most cases the origin remains obscure. Many cases of pneumomediastinum are treated conservatively: the tissues in the mediastinum will slowly resorb the air in the cavity. Some cases need surgery approach for repair the hole in the trachea, esophagus or bowel.

Methods: We collected 3 cases with a final diagnosis of pneumomediastinum, presented at the Emergency Department (ED) with heterogeneous medical conditions, in 2014. 

Case 1: a 29y-old female presented at Melegnano’s ED referring neck pain aroused after a decelerative road accident with cervical and chest blunt trauma occurred the day before.

Case 2: a 22y-old male, affected by cyclic vomiting syndrome, presented at Melegnano’s ED complaining for neck pain, difficulty swallowing and hoarseness following recurrent vomiting.

Case 3: a 16y-old male referred to Lodi’s ED, complaining about sudden chest pain after an asthmatic attack in smoker subject with untreated asthma.

Results: In all patients Chest/Neck CT without contrast demonstrated the presence of air reaching the diaphragm in the mediastinum and the absence of lesions in the pharyngo-larynx and esophagus district. No vital signs impairment were recorded; all patients were admitted and received conservative treatment, including high-flow oxygen and antibiotic prophylaxis,. The patient 3 underwent bronchoscopy that confirmed the absence of significant tracheal lesions. In all cases the pneumomediastinum resulted in a progressive resorption without complications, with a mean length of stay of 5 days.

Conclusions: CT scan is useful in identifying patients with a high likelihood of serious aerodigestive tract injury, and may be used as initial screening tool for selecting patients that can be safely observed and those in need of further evaluations. In the absence of a concomitant pneumothorax or severe illnesses, after an adequate period in observation units in the ED patients with pneumomediastinum could probably be treated on outpatient basis. Diagnostic procedures performed for identifying an underlying anatomic cause (eg. esophageal or tracheo-bronchial rupture) have a low yield and seem to be unnecessary in these cases.

Exertional heat stroke associated to hypoxic hepatitis and rhabdomyolysis

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1Emergency Department, Santa Croce And Carle Hospital, Cuneo, Italy, 2School Of Medicine, University Of Turin, Turin, Italy

Background: On June 2014 a 36 year-old athlete was admitted to our Emergency Department due to syncope occurred during an uphill running competition (distance 12 km, ascent 470 m, outside temperature was 30 ° C) about 20 minutes after the start. He presented with hypotension (90/50 mmHg), high heart rate and body temperature (125 beats/minute and 39.5 °C respectively), regular oxygen saturation (95% without oxygen support) and respiratory rate (16 acts/minute). He appeared diaphoretic and confused with a Glasgow Come Scale of 10, amnesic for the syncope. His blood pressure values normalized after a fluid challenge of about 1500 mL; hyperthermia was treated with ice-positioning. Urinary toxicological and blood alcohol tests were negative. Because of psychomotor agitation he necessitated endovein sedation. Preliminary investigations showed: glucose 75 g/dL, creatinine 1.9 mg/dL, potassium 4.6 mEq/L and sodium 143.5 mEq/L. Brain Computerized Tomography scan was regular. An amount of 5 L of fluids were infused during the stay in Intensive Care Unit. His mental status progressively improved: 12 hours later he was orientated and felt well. The patient denied water intake during the competition. Blood investigations performed the day after revealed elevated Creatinine Phosphokinase values (CPK), Glutamic Pyruvic Transaminase (GPT) and Glutamic Oxaloacetic Transaminase (GOT) levels (4109 U/L, 2871 U/L and 1888 U/L respectively). Abdomen ultrasounds didn’t show any signs of liver diseases; liver viral and autoimmune screen laboratory tests were negatives. The final diagnosis was exertional heat stroke associated to rhabdomyolysis and hypoxic hepatitis. Four days later, the patient was discharged: CPK, GPT and GOT were progressively decreasing (511 U/L, 336 U/L and 1450 U/L respectively). He was advised to continue oral hydration and to stay at rest for few days. He was suggested to maintain oral hydration during heavy physical efforts in hot-humid seasons. Hypoxic hepatitis is a very uncommon event in young healthy patients: cases of acute liver impairment are reported in literature associated to heat stroke and rhabdomyolysis. Its management involves fluid administration and inotropic support, when necessary. Low evidence exists on N-acetyl cysteine use in hypoxic hepatitis. About exertional heat illness, the American College of Sports Medicine and the National Athletic Trainers Association recommend immediate cooling, preferably, with ice water immersion.
**Topic: ACUTE DISEASES MANAGEMENT**

**The great illusionist**

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**Background:** The epidemiology of Pulmonary Embolism (PE) is difficult to determine because it may remain asymptomatic or its diagnosis may be an incidental finding; sometimes the first presentation may be sudden death.

**Results:** A 45 year old woman came in Emergency room (ER) for pain in the left hip radiating along left ureter course of the exacerbated by the breath, the movements and pyrexia. Gravity code green, no disease in history, smoke in estrogen-progestin therapy. Vital signs and clinical examination were normal. At the US evaluation there was no evidence of hydronephrosis, although the urine stick found ketones, protein and red blood cells. At the lab tests renal function was normal but there was a neutrophilic leukocytosis. It has been administrated to the patient analgesic therapy bringing to pain resolution. The patient was also subject to urological assessment and was later discharged. Next day afternoon the patient returned in ER, complaining of pain similar to the previous day, but also located at the left hemithorax base associated with dyspnea and fever. Vital signs were normal except HR 125 bpm. Objectively she appeared tachypneic, tachycardia, pain in the left hip. At the US evaluation dubious left hydronephrosis and B lines at the lung left base. The patient was subjected to ECG with sinus tachycardia and EGA with hypocapnia in normoxia. Lab tests showing an increase in neutrophilic leukocytosis and positive D-dimer. In view of the clinical presentation, the US pattern, thromboembolic risk factors and lab data, it has been decided to submit the patient to chest and abdominal CT with and without contrast to rule out or confirm the suspicion of PE or nephritic problems. The CT scan showed a EP lower left lobar branches associated with lung infarction and inflammatory thickening associated with pleural effusion. Anticoagulation therapy was started and the patient was hospitalized in pneumology.

**Conclusions:** The case show how it can be treacherous the PE diagnosis. The first time in ER, the clinical and the lab tests defined a clear clinical picture of renal colic. The second time symptoms, vital signs, instrumental examinations and lab tests brought to suspect PE in a patient with risk factors. Everytime the clinical presentation raises PE suspicion it should be done further objective testing.

**Topic: THE HEALTH-SOCIAL ROLE OF EMERGENCY MEDICINE**

**Pink code project: “violence against women- multidisciplinary health and social intervention protocols”**

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**Background:** The Public Health Authority of the Northern Province of Naples (ASL NA2 Nord) has a population of about 1.100.000 residents and its General Manager is G. Ferraro. It covers a territory divided into 32 municipalities with 2 Islands: Ischia and Procida. It has 4.500 employees and 2.500 affiliated professionals. The ASL NA2 Nord is composed of 13 Health Districts and 5 Hospitals.

**Methods:** The training course “Pink Code: Violence against women”, in accordance with the law of the Campania Region n.22 of 21/07/2012 and the Istanbul Convention of May 2011, organized in May 15, 22, 29 and June 5, 12, 2014 at ASL NA2 Nord, was addressed to 75 public health and social
A nutritional deficiency causing a cardiogenic shock: a case report

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**Background:** Thiamine is an important cofactor in carbohydrate metabolism, with limited body stores leading to the possibility of a deficit after few days of not assumption. Chronic deficiency may present as Wernicke-Korsakoff encephalopathy, polyneuropathy and high output heart failure possibly leading to cardiogenic shock. Presently severe thiamine deficiency is uncommon in developed countries although possible in malnourished patients.

**Methods:** A 58 year old man was admitted to the General Surgery Department for a severe pyloric stenosis at the level of a previous gastroduodenal anastomosis. He presented with severe vomit that prevent him adequate feeding for more than 3 weeks. During the hospital stay the patient developed neurological symptoms with confusion and memory deficit without radiological signs. In the following days he developed shortness of breath and chest pain. The ECG disclosed previously absent negative T wave in anterior leads, associated with positive levels of TnI. Echocardiography showed severe left ventricle dilation and dysfunction (LVEF 30%) with normal right ventricle. BGE showed high arterial lactate levels reaching 8.6 mmoli/l, high central venous hemoglobin saturation (SvO2 83%). His condition rapidly deteriorated despite treatment with cPAP ventilation, nitrates and diuretics and, in few hours, he developed hemodynamic shock requiring inotropic support. On the basis of these findings and on the patient’s history of CABG, under the hypothesis that myocardial ischemia could have contributed to the development of cardiogenic shock, he underwent coronaryangiography that showed normally functioning grafts and severe stenosis of a branch of intermediate size treated successfully with PCI and stent implantation. Septic shock was excluded. Due to the recent history of malnutrition, we suspected thiamine deficiency as the major mechanisms of cardiogenic shock. Accordingly, we administered 100 mg iv. thiamine.

**Results:** In the following 3 hours, we observed a rapid improvement of the hemodynamic conditions with resolution of shock, normalization of arterial lactate levels and venous saturation and almost complete regression of ECG with significant improvement of echocardiographic abnormalities.

**Conclusions:** Thiamine deficiency is a very rare cause of heart failure. In this case, the mild coronary abnormality likely contributed to the precipitation of heart failure into cardiogenic shock, but the high central saturation level strongly favored thiamine deficiency as the main underlying mechanisms. This hypothesis appeared confirmed by the rapid improvement following treatment.

**Topic:** CARDIOVASCULAR CRITICAL CARE MEDICINE

**Topic:** SEPSIS AN INFECTIOUS DISEASES

Diagnosis of severe plasmodium falciparum malaria in emergency department: a case report

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**Background:** The incidence of imported malaria is about 20000 cases/year, with a mortality rate of 150 cases/year. An early investigation for Plasmodium spp. infection should be done in all patients admitted to Emergency Departments (E.D.) with fever or signs of sepsis and being at high risk of infection (i.e. travelers or immigrants coming from endemic regions not undergone to the chemoprophylaxis).

**Methods:** We present a case of severe sepsis by Plasmodium Falciparum malaria observed at the E.D. of Gardone Val Trompia hospital.
**Results:** A 50 years-old man was admitted to the E.D., complaining fever lasting from 2 weeks, worsening dyspnea and cough. Symptoms started few days after his return to Italy from Senegal; he didn’t undergo the standard antimalarial chemoprophylaxis. At physical examination fever (38.5°C), tachypnea, tachycardia (140 b.p.m.), normal pulmonary and abdominal findings, a dry and hypohydration skin were present. Oxygen saturation was 92%, arterial blood pressure (BP) was 150/90 mmHg. Blood laboratory tests showed anemia (hemoglobin 6,4 g/dl), thrombocytopenia (34000 platelets/cc), a normal white blood cells count, creatinine 1,5 mg/dl, total bilirubin 2,3 mg/dl, elevated reactive C protein (P.C.R.), lactacidemia 12 mmol/l (normal values 0,6-1,2). In the suspicion of malaria infection, a thick blood smear observation was performed, with a positive finding of Plasmodium Falciparum, and with a parasite rate of 30%, consistent with the diagnosis of severe P. Falciparum malaria. A thorax CT-scan excluded any pulmonary, pleural or mediastinal lesions. Oxygen therapy at low flows by nasal mask, i.v. acetaminophen and i.v. fluids were administered. Still feverish but haemodinamically stable, the patient was admitted to the Infectious Disease Unit of Spedali Civili General Hospital in Brescia and underwent the specific antimalarial combination therapy, red blood cells transfusions and i.v. fluids. A fast improvement of clinical conditions and of laboratory tests (hemoglobin 9,8 g/dl, platelets 225000/cc, creatinine 0,8 mg/dl, normal values of P.C.R.), and a complete negativization of the parasite research on thick blood smear, were observed in the following days and the patient was discharged from the hospital 7 days after the admission.

**Conclusions:** This case-report shows how the early diagnosis of P. Falciparum malaria done at the Emergency Department allows a timely specific antimicrobial therapy and a complete recovery from severe sepsis, preventing fatal complications.

**Topic:** ACUTE DISEASES MANAGEMENT

**A case of major bleeding during vka anticoagulant therapy for deep venous thrombosis, atrial fibrillation and a mechanical mitral valve; a series of unfortunate complications**

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**Background:** Major bleeding is a complication of all the known anticoagulant therapy available; the availability of reversing agent for each of them is a necessity in the emergency department.

**Methods:** A woman aged 69 came to the ED complaining pain of acute onset of the left haunch without prior traumatic injury. The patient was affected by G4 stage renal disease for IgA glomerulonephritis; she was in VKA anticoagulation both for permanent atrial fibrillation and for a mechanical mitral valve; her INR at admission was 2,4, underestimated for the range expected. A venous scan of the leg showed deep venous thrombosis of the left common femoral vein. LMWH was started and warfarin was potentiated. At day 4th INR was 3.4 but the pain was still worsening, radiated on the back and in the left quadrants of the abdomen, heart rate was 115bpm and blood pressure was 85/60 mmHg; Hb was 8,6 gr/dl (Hb at admission:11.9gr/dl); an ultrasound of the abdomen showed massive hemoperitoneum with multiple focuses of active bleeding. The patient underwent angiographic procedure of embolization of the bleeding focus. At day 12th the patient became tachycardic, Hb 7,7 gr/dl; the patient underwent angiographic procedures with embolization of multiple focuses of bleeding in massive hemoperitoneum and hemothorax. A large spectrum antibiotic therapy was started as the patient presented in the abdomen a wide hematoma(17x15x9cm) that was organising with compression of the nearest structures, causing both suboclusive syndrome and lymphedema of the left leg that was turning into dermohypodermite; inflammation index remained increased leading to the doubt of a potential infection of the hematoma. At day 34th clostridium difficile was found in faeces specimen, while renal function worsened to an end stage renal disease until dyalitic treatment. At the day 43th of recovery the patient was found in cardiorespiratory arrest. From both blood and urine specimen collected two days before death klebsiella pneumoniae resistant to the current antibiotic therapy was isolated.

**Results:** The aging of the population lead to the emergency department patient of greater complexity with multiple pathology. Most of the studies for the safety of the anticoagulants agents often excluded patients of such complexity.

**Conclusions:** The bad control of major bleeding in patient with multiple pathology can lead to an unfortunate series of events.

**Topic:** BIOMARKERS IN ACUTE DISEASES

**BNP and pct utility in the management of acute heart failure patients (AHF) with or without infections**

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**Background:** Procalcitonin (PCT) has been used for the early diagnosis of sepsis, differential diagnosis between bacterial and viral infections, and antibiotic guide in clinical treatment. Infections are one of the common causes of acute decompensated heart failure and the PCT detection was found to be useful in the diagnosis of bacterial infection complicated by heart failure.
Methods: this was a retrospective analysis conducted on patients admitted in emergency medicine ward from 2012 and 2013. All patients were admitted from emergency room for dyspnea with a final diagnosis of acute heart failure (AHF) with or without infection. We analyzed the serum level of PCT in these patients in terms of prognostic role for in-hospital mortality.

Results: We collected data from 187 patients with diagnosis of heart failure with (n = 42) and without (n = 145) infection. All data were collected at the time of arrival in emergency department.

BNP levels were not significantly different in patients with AHF (466 pg/ml) and in patients with AHF and infection (605 pg/ml) (p = 0.15)

As for BNP, the median value of PCT was not significantly different in these two subgroups: 0.11 in patients with AHF vs 0.17 in patients with AHF and infection, p = 0.16.

Because a “not-negative” PCT value, 74/145 patients with acute heart failure without diagnosis of infection, received antibiotic therapy. Analyzing the PCT value, patients who received antibiotic therapy showed significantly higher level of PCT compared to patients who did not (median value 0.15 ng/ml vs 0.09 ng/ml, p = 0.0006)

Otherwise, while median values of BNP were not different, AHF patients died during hospitalization showed higher level of PCT (0.35 pg/ml vs 0.11 pg/ml, p = 0.001).

Because a “not-negative” PCT value, 74/145 patients with acute heart failure without diagnosis of infection, received antibiotic therapy. Analyzing the PCT value, patients who received antibiotic therapy showed significantly higher level of PCT compared to patients who did not (median value 0.15 ng/ml vs 0.09 ng/ml, p = 0.0006)

Furthermore, compared to BNP, PCT showed a better prognostic value in predicting in-hospital mortality (AUC 0.77 p <0.0001 vs AUC 0.63 p = 0.039)

Conclusions: The results showed that patients with heart failure had serum levels of PCT not significantly different than the group of patients with heart failure and infection. This finding could suggest that heart failure may interfere with PCT expression.

The data in this study suggested that PCT could have a prognostic value in predicting worse outcome in patients hospitalized for acute heart failure with or without infection.

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Topic: RESPIRATORY CRITICAL CARE MEDICINE

Advanced management of patients with acute respiratory failure using noninvasive mechanical ventilation combined with biomarkers

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Background: Acute respiratory failure (ARF) is a common emergency department (ED) presentation. According to several randomized controlled trials, the non-invasive ventilation (NIV) has gained acceptance as the preferred ventilatory modality to treat ARF due to acute exacerbations of chronic obstructive pulmonary disease (AECOPD), cardiogenic pulmonary edema. During NIV, the parameters of clinical course are PaCO2, PaO2/FiO2 ratio, pH and respiratory rate: their improvement in the first two hours is the best predictor of NIV success. Recent literature demonstrated the diagnostic and prognostic role of several biomarkers in critically ill patients. In particular, the role of ST2 as a prognostic biomarkers was examined in different conditions frequently observed in ED, such as acute myocardial infarction, congestive heart failure and non-cardiac dyspnea.

The aim of the study was to evaluate the individual and collective ability of BNP, PCT and ST2 for predicting in-hospital mortality in patients presenting in ED with ARF, treated with NIV and hospitalized.

Methods: This is a prospective, observational study, enrolling patients admitted to our ED for acute respiratory failure, requiring non-invasive mechanical ventilation and hospitalization; as ventilation’s mode, pressure support ventilation (PSV) will be used. The blood samples for biomarkers measurements and gas-analysis were performed: before starting NIV, 24 hours (T1) after the start of NIV and after 48 hours (T2).

Results: We enrolled 31 patients: the causes of ARF requiring NIV were pulmonary edema, AE-COPD, ARDS and pneumonia/sepsis. 11/31 (35%) patients died during hospitalization.

While at the time of presentation (T0) and after 24 hour (T1) from starting NIV, the mean serum levels of ST2 were non significantly different in survivors and non survivors (82±44 vs 72.2 ± ♦ 58, p = 0.5 and 76.6±44 vs 73.0 ± ♦ 38, p = 0.85), significant differences were noted in ST2 levels at T2 (after 48 hours). In fact compared with survivors, the patients who died during hospitalization showed significantly higher levels of ST2 (78.1 ± ♦ 30 vs 47.8 ± ♦ 21, p = 0.03). Furthermore, levels of ST2 after 48h from start of NIV showed a significant prognostic power in predicting in-hospital mortality (AUC 0.8, p = 0.04)

Conclusions: From these preliminary results ST2 seems to be a new biomarker for prognostic stratification of patients with acute respiratory failure needing NIMV.
**Topic: CARDIOVASCULAR CRITICAL CARE MEDICINE**

**Mild therapeutic hypothermia for patients with acute coronary syndrome and cardiac arrest treated with percutaneous coronary intervention (unicorn). Research proposal**

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**Background:** The existing data regarding effectiveness and safety of mild therapeutic hypothermia (MTH) for treatment of out-of-hospital cardiac arrest (OHCA) survivors are inconsistent. Observations from small randomized trials and several observational studies revealed beneficial effects of this method. According to the European guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation guidelines released in 2012 MTH is indicated “early after resuscitation of cardiac arrest patients who are comatose or in deep sedation” (class of recommendation I, level of evidence B). However, recently published results of the biggest randomized trial are contradictory - in unconscious survivors of out-of-hospital cardiac arrest of presumed cardiac cause, hypothermia at a targeted temperature of 33°C did not show a benefit as compared with a targeted temperature of 36°C. Moreover, we found the methodology applied in this trial questionable. Therefore we propose a prospective, observational, multicentre study: Mild therapeUtic hypothermia for patieNts with acute CORoNary syndrome and cardiac arrest treated with percutaneous coronary intervention (UNICORN).

**Primary objective:** To assess whether mild therapeutic hypothermia applied in patients with acute coronary syndrome and cardiac arrest treated with percutaneous coronary intervention is associated with higher 180-days survival rate as compared to therapy without hypothermia.  

**Secondary objective:** 1) To assess the influence exerted by additional treatment with mild therapeutic hypothermia on the neurological outcome at discharge from hospital; 2) To assess whether evaluated therapy is associated with increased rate of early stent thrombosis (up to 30 days); 3) To assess impact of evaluated therapy on in-hospital clinical outcomes with regard to safety (bleeding, infectious complications, rhythm and conductions disorders).  

**Methods:** Study design and duration: prospective, multicentre, international, observational, matched case-control study testing the influence of mild therapeutic hypothermia applied in patients with acute coronary syndrome and cardiac arrest treated with percutaneous coronary intervention on 180 days clinical outcome. Two groups of centers will enrol patients into the study: 10 centers performing therapeutic hypothermia procedures (250 patients) and 10 centers treating comatose patients without hypothermia (250 patients). The SIRIO Medicine Group will provide an independent data and safety monitoring.

**Results:** To be defined.

**Conclusions:** To be defined.

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**Topic: CARDIOVASCULAR CRITICAL CARE MEDICINE**

**Mild therapeutic hypothermia for patients with acute coronary syndrome and cardiac arrest treated with percutaneous coronary intervention. A single center study**

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**Background:** There is a paucity of data regarding clinical outcomes associated with the integration of a mild therapeutic hypothermia (MTH) protocol into a regional network dedicated to treatment of patients with acute coronary syndromes (ACS). Observations from small randomized trials supported by several observational studies revealed beneficial effects of this method. However, recently published results of the biggest randomized trial are contradictory. Nevertheless we found the methodology applied in this trial questionable. The goal of our study was to assess the clinical effectiveness and safety of MTH program using a previously established ACS network in consecutive comatose OHCA survivors.

**Methods:** We conducted a prospective historically controlled single centre study. The primary and secondary efficacy end points were hospital survival with a favourable neurological outcome (Cerebral Performance Category of 1 or 2) and all-cause in-hospital mortality, respectively. The primary safety end point was occurrence of definite stent thrombosis, while the development of pneumonia, presence of positive blood cultures, occurrence of probable stent thrombosis, any bleeding complications, the need for red blood cell transfusion and presence of rhythm and conductions disorders during hospitalisation constituted secondary safety end points.

**Results:** Comatose OHCA survivors (n = 69) were referred to our Department based on ECG recording transmissions or directly admitted from the Emergency Department. Compared with controls (n = 35), they were more likely to be discharged from hospital with a favourable neurological outcome (69.3% vs. 25.7%; p=0.032; number needed to treat [NNT] = 4.24) and experienced lower all-cause in-hospital mortality (26.1% vs. 41.4%; p=0.047; number needed to treat [NNT] = 6.24).
In every patient included in the study, Total Body MultiDetector Computed Tomography scanning was assumed as the diagnostic gold-standard.

Right and left lung were considered separately for each patient to diagnose pneumothorax.

In 780/780, the exam was extended to chest, with anterior and lateral scans of thorax.

We evaluated 780 severely injured patients (ISS>15) admitted to our Emergency Department from January 2012 to January 2014.

**Methods:** This was a retrospective, observational, single-centre study, at a tertiary referral hospital (850 beds).

**Results:** In the female group left ventricular ejection fraction (LVEF) improved from 24 ± 8% to 39 ± 14%; in the male group from 24 ± 7% to 33 ± 11% (both p <0.001), difference between the sexes was significant (p < 0.05). Myocarditis was detected in 58 patients (41%), in 50% of women and in 39% of men. The change in LVEF in patients with myocarditis was 20 ± 12% in females and 13 ± 13% in men (both p <0.001), the difference between both groups was not significant (p = 0.094). Statistically significant difference in the change in LVEF between subgroups with or without myocarditis in the female group (20 ± 12% vs 9 ± 14%; p < 0.05) as well as in the male group (13 ± 13% vs 5 ± 9%; p <0.001) was observed.

**Conclusions:** Male and female patients with RODCM showed significant improvement in LVEF and other echocardiographic parameters in the 6-month follow-up. LVEF changes in female group were more expressed. In patients with myocarditis was LV function improvement bigger then in patients without myocardial inflammation in males as well as in females with trend to more pronounced changes in women.

Acknowledgements: This work was supported by grant IGA CR No. NT14087.

**Topic: TRAUMA AND MAXI EMERGENCIES**

Lung ultrasound impact on first-line pneumothorax major trauma management: multidetector computed tomography comparison

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**Background:** This study aimed to evaluate the diagnostic accuracy of Bed-side Lung Ultrasound, performed as Extended-FAST in detecting pneumothorax during the Primary Survey, in patients with major trauma (ISS>15) and both stable and unstable hemodynamics. From literature is well known that chest radiography alone has poor sensitivity for the detection of pneumothorax and US is superior to CXR. In cases in which the patient requires urgent surgery or another urgent intervention before undergoing CT, chest US seems applicable to rule out pneumothorax.

**Methods:** This was a retrospective, observational, single-centre study, at a tertiary referral hospital (850 beds).

We evaluated 780 severely injured patients (ISS>15) admitted to our Emergency Department from January 2012 to January 2014.

All ultrasound examinations (780 extended-FAST), during Primary Survey, were performed at the bedside, in Emergency Room, by using the same US imaging unit; in 780/780, the exam was extended to chest, with anterior and lateral scans of thorax.

Right and left lung were considered separately for each patient to diagnose pneumothorax.

In every patient included in the study, Total Body MultiDetector Computed Tomography scanning was assumed as the diagnostic gold-standard for comparison.

**Results:** From January 2012 to January 2014 we performed 780 Extended-FAST in 780 Major Trauma patients (ISS>15).

E-FAST identified 137 Pneumothoraces, during the time of Primary Survey (within the first 5 minutes) allowing a rapid and useful diagnosis, to lead a correct interventional (pleural drainage or decompressive minitoracotomy) or conservative (observational) patient management.

MDCT scan, the diagnostic gold standard, found 140/140 Pneumothoraces.
In 3 False Negative cases, the Pneumothoces missed by E-FAST exam was <5 mm.

In our experience, pneumothorax lung ultrasound diagnosis, during Primary Survey of Major Trauma, has Sensibility 97.8% (137/140), Specificity 100% (640/640), P.P.V. 100% (137/137), N.P.V. 99.5%, Accuracy 99.6% (777/780).

**Conclusions:** During the time of Primary Survey (within the first 5 minutes) Lung ultrasound, performed as extended to thorax - FAST, allow a rapid and useful diagnosis of pneumothorax, to lead a correct interventional or conservative patient management.

In this study, bedside Lung Ultrasound confirmed to be a rapid and accurate method for detecting traumatic pneumothorax. Therefore, bedside Thoracic Ultrasound can be an effective diagnostic tool to definitively rule out this potential life-threatening condition in the Major Trauma patient.

**Topic:** THE PREGNANT AND THE PEDIATRIC PATIENT IN ED

**Lung ultrasound integrated with chest-XR in first diagnosis of pediatric pneumonia: its role in follow-up**

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**Background:** Aim of this prospective study was to evaluate the role of lung ultrasound integrated with Chest XR for the first diagnosis of pediatric pneumonia, and to define its role during the follow-up, to exclude complications. In the first diagnosis, we compared for the two technique (LUS and CXR), in double blinded study, sensibility, specificity, accuracy, PPV and NPV.

**Methods:** Observational prospective study with evaluation of 50 children (3 to 10 years; 6y median; 28 M e 22 F) with clinical signs of cough, fever (more than 3 days); at LUS. (with linear and convex probe) we evaluated both anterior and posterior lung (seated or lie down); we reported every consolidation with size, pleural effusion (with quantification; CXR made in 2 projection; only LUS follow-up (after 5 and 10 days) in positive patients.

**Results:** In our preliminar study (N=50), we found with LUS 35/50 pneumonic consolidations (size from 1.5 to 7 cm); with ChestXR only 26/50; with LUS we had 1 false negative (retroscapolar region). We followed-up with LUS 36=50 and found 3/36 small pleural effusion (less than 50ml). LUS had sensitivity of 97% (vs CXR 72%), specificity and PPV of 100% (CXR 100%), NPV 93% (CXR 60%) accuracy 98% (CXR 80%).

**Conclusions:** In our limited and preliminary experience, Lung Ultrasound, integrated with Chest XR, revealed to be an accurate method to identify also small pneumonic consolidations, specially for “CXR-occult” and for pleural effusion’s early diagnosis; furthermore, LUS follow-up allows to verify complications and outcome avoiding other XR exposure.

**Topic:** CARDIOVASCULAR CRITICAL CARE MEDICINE

**Finn-akva-2: chain of pre- and in-hospital management of acute heart failure in Helsinki metropolitan area**

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**Background:** Acute heart failure (AHF) is one of the most common causes of admission to emergency department (ED) and death among elderly people. A lot of attention is focused on early management in ED but data are scarce. Moreover, even less is known about the effect of pre-hospital emergency care on patients’ clinical manifestation on admission to ED and to prognosis. Our aim is to investigate the role of pre-hospital emergency care and improvement of patients’ condition from home to ED and early in-hospital management in real life. Our interest is also in the effect of the early pre- and in-hospital treatment on patients’ hospital stay and both short- and long-term survival.

**Methods:** Data is retrospectively collected from the electronic patient records from pre-hospital emergency care and three hospitals of Helsinki University Central Hospital in Helsinki metropolitan area. Patients who had been admitted to ED either after pre-hospital care or without such care - and diagnosed for AHF between 1.7.2012 and 31.7.2013 were included. The data includes the clinical type of heart failure, comorbidities, clinical findings and treatment in the pre-hospital emergency care and during the first 24 hour hours in hospital recorded in 4-8 hour
intervals, the cause of the AHF and the treatment of it, relevant long-term medication on admission and at discharge, the length of stay in the hospital and one-year mortality.

**Results:** We have collected data from 500 patients. The database is currently finalized and will be analysed with SPSS. The results will be available for the 5th Italian GREAT Network Congress.

**Conclusions:** The study shows the real-life management in pre-hospital and early in-hospital emergency care of acute heart failure patients. The study describes the role of pre-hospital emergency care and improvement of patients’ condition from home to ED and early in-hospital management in real life. The effect of the early pre- and in-hospital treatment on patients’ hospital stay and both short- and long-term survival will also be analyzed.

**Topic:** BIOMARKERS IN ACUTE DISEASES

**New biomarkers in the management of sepsis in emergency medicine: role of galectin-3**

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**Background:** Sepsis, severe sepsis and septic shock are among the leading causes of death in critically ill patients: prompt diagnosis is one of the keys to improve survival. Procalcitonin (PCT) displays good diagnostic and prognostic accuracy, but it has limited specificity: increased levels are also found in non-infectious conditions. Presepsin is a promising biomarker: it reaches higher concentrations in sepsis than in SIRS (Systemic Inflammatory Response Syndrome). Furthermore it shows important prognostic capability. Galectin-3 is a lectin expressed by macrophages: it takes part to the inflammatory response and fibrosis process. In this study we compared Galectin-3 with Presepsin and PCT as markers of sepsis in the Emergency Department (ED) of “Città della Salute e della Scienza” University Hospital of Turin. We enrolled patients affected by SIRS, with or without a suspicion of infection; diagnostic and prognostic efficacy of each biomarker were evaluated.

**Methods:** 108 patients were enrolled: 37 with sepsis, 39 with severe sepsis/septic shock and 32 with SIRS. Controls included patients with SIRS secondary to trauma, burns and other medical diseases. The biomarkers were assessed at the first medical evaluation in the ED, together with routine laboratory tests and arterial blood gas analysis; APACHE II and SOFA score were calculated. Definitive diagnosis and in-hospital survival rates at 60 days after enrollment were obtained through analysis of medical records.

**Results:** Galectin-3 distinguished the population with severe sepsis/septic shock from patients with sepsis (p=0.053) but not from patients with SIRS (p=0.09). Presepsin was increased in severe sepsis/septic shock compared with controls (p=0.036); PCT was higher in severe sepsis/septic shock group than in septic patients and controls (p<0.001). The ROC curve analysis of Galectin-3 was significant: AUC (Area Under the Curve) was 0.66; higher concentrations were associated with poor prognosis (p=0.0238). Galectin-3 was correlated with leukocytes (p=0.0145) and PCT (p=0.0391). The Cox regression analysis showed that, when combined with other clinical and laboratory parameters, Galectin-3 is the only statistically significant prognostic factor (p=0.0013).

**Conclusions:** Galectin-3 is a promising marker in the clinical management of sepsis: it is able to identify cases of sepsis associated with acute organ damage. Finally Galectin-3 showed a role as an independent prognostic factor, stratifying the population of subjects with sepsis associated with poor prognosis according to its increasing concentrations.
**Topic: BIOMARKERS IN ACUTE DISEASES**

**From accutni to accutni+3: effect of a change in troponin assay and chest pain protocol on los, safety and efficiency of an observation ward - an ongoing study**

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**Background:** A new troponin assay (AccuTnI+3, Beckman Coulter - CV of <=10% at the 99th percentile) has recently replaced the previous assay (AccuTnI - CV of 16% at the 99th percentile).

With the adoption of the new assay we reduced the observation curve from 12 to 6 hours; we expect the new protocol/assay to be as safe and efficient as the old one.

The study will be completed by December 2016 including the 2 months follow up.

**Methods:** The patients observed for 6 months before the implementation of the new protocol will be compared with the patients observed under the new protocol.

Samples were drawn every 6 hours from admission for a total of 12 hours observation under the old protocol; with the new protocol samples are drawn every 3 hours for a total of 6 hours observation; patients’ ECG is monitored with continuous telemetry under both protocols.

A 2 months follow up is being carried out: outcomes measured are death and new hospital admissions with a definitive diagnosis of ACS.

**Results:** 182 patients (101 males, mean age 61.6 years, mean TIMI risk score 1.43) were observed for chest pain under the old protocol; patients’ ECG was monitored for an average of 13 hours and 20 minutes. 6.6% of patients (12/182, all males, mean age 60.9 years, mean TIMI risk score 3) were admitted with the suspicion of an ACS based on ECG monitoring (4), on troponin changes (6) and both on ECG monitoring and troponin changes (2). For 10/12 an ACS was confirmed. At 2 months follow up 2 patients were admitted with a suspected ACS: for 1 ACS was confirmed. Preliminary analysis of data after two months of the implementation of the new protocol. During this time 63 patients (45 males, mean age 60.3 years, mean TIMI risk score 1.38) have been observed for chest pain; patients’ ECG has been monitored for an average of 7 hours and 12 minutes. 7.9% of patients (5/63, 4 males, mean age 60.1 years, mean TIMI risk score 2.8) were admitted with the suspicion of an ACS on ECG monitoring (1), on troponin changes (3) and on a ischemic stress ECG (1). For 4/5 ACS was confirmed.

**Conclusions:** So far the two protocols seem similar.

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**Topic: RESEARCH IN EMERGENCY MEDICINE**

**Safer: study of atrial fibrillation in the emergency room. An observational study of af patients presenting to two emergency departments in the southwest of England**

J. Gagg¹, C. Mann¹, A. Appelboam⁷
¹Musgrove Park Hospital, Emergency Department, Taunton, United Kingdom, ²Royal Devon & Exeter Hospital, Emergency Department, Taunton, United Kingdom

**Background:** Atrial fibrillation (AF) is the most common sustained disorder of cardiac rhythm with a prevalence of 8.8% by 80-89 years. It is associated with a fivefold increase in the incidence of stroke. It has been previously reported that up to 55% of ‘warfarin eligible’ patients presenting to Emergency Departments (EDs) in America are inappropriately anticoagulated. This may be changing with the introduction of the novel oral anticoagulants. We aim to define the population of AF patients presenting to two EDs in the Southwest of England to identify if an ‘at risk’ population exists.

**Methods:** Patients attending EDs at Musgrove Park Hospital, Taunton and the Royal Devon & Exeter Hospital identified to be in AF on ECG were logged over a 12 week period to obtain a convenience sample of patients. The case notes were reviewed to record patient demographics, type of AF (known/unknown), current oral anticoagulant (OAC)/antiplatelet therapy and CHA2DS2-VASc/HASBLED scores. Current NICE guidelines were used to establish the appropriateness of medication.

**Results:** 446 patients were recruited (222 male:224 female). AF was a known diagnosis in 346 (77.6%) of patients and a first presentation in 100 (22.4%). The mean age was 78 years (25-98 years), the mean CHA2DS2-VASc score was 3.9 (range 0-9) and HASBLED score 2 (range 0-9). 8 patients had no drugs listed and 3 were on an OAC when not indicated. Of the remaining 337 patients, 118 (35%) were not on correct medication. Patients were not on an OAC when indicated by CHA2DS2-VASc score in 27% of those with a HASBLED score >=3 and 40% for those with a HASBLED score < 3. Of those with a first presentation of AF, 80% warranted consideration of starting an OAC based on CHA2DS2-VASc score.

**Conclusions:** Two main areas of risk have been identified: those patients who are known to be in AF who could have their treatment optimised (35%) and those attending with a first presentation who need treatment (80%). It is apparent that a greater proportion of patients are not anticoagulated if they fall into the lower risk group with regard to bleeding (HASBLED<3). As a notes review, there are limitations to this study, however it suggests that there is an opportunity in ED to identify ‘at risk’ patients in AF which warrants further investigation.
**Topic:** ACUTE DISEASES MANAGEMENT

One brain for two scores

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University Of Pavia - School Of Emergency Medicine, Pavia, Italy


**Methods:** First ABG in VM 35%: PH 7.459 PO2 58.1 PCO2 35 HCO3- 25.1 BE 0.4 SO2 91.9 P/F 166

Blood tests

Chest X-ray: Pleural effusion on the right. Small circle congestion.

<table>
<thead>
<tr>
<th>WBC</th>
<th>X 10^9/µL</th>
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</thead>
<tbody>
<tr>
<td>% NEU</td>
<td>%</td>
<td>&gt; 89.8</td>
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<tr>
<td>HB</td>
<td>g/dL</td>
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<td>HCT</td>
<td>%</td>
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<tr>
<td>PLT</td>
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<tr>
<td>PCR</td>
<td>mg/dL</td>
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<td>GLC</td>
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</tr>
<tr>
<td>UREA</td>
<td>mg/dL</td>
<td>40</td>
</tr>
<tr>
<td>SODIUM</td>
<td>mmol/L</td>
<td>136</td>
</tr>
<tr>
<td>Pneumococcal and Legionella</td>
<td>Urinary Antigen Tests (UAT)</td>
<td>negative</td>
</tr>
</tbody>
</table>

The patient performs a CT scan and two blood cultures, starts empirical antibiotic therapy and finally hospitalized.

**Results:** Does this patient really need to be hospitalized?

We can use both CURB-65 and PSI to help us decide if this patient needs to be hospitalized or not.

- By applying the CURB-65 the result is 1 with a 3.2% mortality at 30 days.

This score suggests us not to hospitalize the patient

- By applying the PSI the result is 115, class IV, with a 8.2 – 9.3% mortality at 30 days

This score suggests us to hospitalize the patient.
Both PSI and CURB65 are useful tools to identifying patients with a low risk of complications/mortality, reducing therefore the number of hospitalizations.
The PSI has a higher sensitivity (but low specificity)
The CURB-65 has a low sensitivity and it is simple to apply, but it does not consider variable ‘oxygenation’
So? What can I do?........Use brain first!

**Conclusions:**

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**Topic: BIOMARKERS IN ACUTE DISEASES**

**Research proposal: use of biomarkers for risk prediction in patients with infective endocarditis**

1Heart Institute (InCor), University of Sao Paulo Medical School, Sao Paulo, Brazil, 2University Hospital, Basel, Switzerland, 3University ‘La Sapienza, Rome, Italy

**Background:** Evidence regarding biomarkers for risk prediction in patients with infective endocarditis is limited. In a previous retrospective study of patients admitted with endocarditis in our institution, we showed that high BNP levels at admission are related to in-hospital death. Considering the potential of the new prognostic biomarkers in heart failure and sepsis, we propose a pilot study to evaluate their individual or combined role in predicting death or cardiac surgery in patients with infectious endocarditis.

**Aims:**
- Evaluate the use of biomarkers as predictors of in-hospital death in patients with endocarditis
- Evaluate the use of biomarkers as predictors of a combined endpoint (in-hospital death or cardiac surgery) in patients with endocarditis

**Methods:**

**Patients Selection**
Consecutive patients admitted to the Emergency Department with suspected endocarditis will be included.

**Inclusion Criteria**
- >18 years
- Suspected endocarditis
- Patients who sign the Informed Consent Form

**Exclusion Criteria**
- Patients do not fulfill Duke’s criteria for possible or definite endocarditis
- Use of intravenous antibiotic for more than 72h before enrollment

**Procedures**
Two pairs of blood culture will be collected and an echocardiogram will be performed in all patients with suspected endocarditis. Empirical or specific antibiotic treatment and cardiac surgery recommendations will follow the European Society of Cardiology Guidelines. Blood sample for biomarkers and exhaled air for determination of acetone will be obtained at study inclusion and stored at -80°C. Another blood sample for biomarkers evaluation and exhaled air for acetone determination will be obtained on day 8 after antibiotic initiation in patients with possible or definite infective endocarditis. Results will be available only after the end of follow-up, and will not be disclosed to the attending physicians during patient’s treatment.

The follow biomarkers will be studied: C-reactive protein, Procalcitonin, BNP, high-sensitivity cardiac troponin, ST2, Exhaled acetone, Copeptin, Soluble urokinase-type plasminogen activator receptor and mature adrenomedullin.

We intent to include sixty patients for this pilot study.

**Statistical analysis**
The primary endpoint will be In-hospital death and secondary endpoint will be in-hospital death or need for surgical replacement of the infected valve. A ROC curve will be constructed for each biomarker to find the best cut-off value. Univariate and multivariate models will be performed to establish correlation between biomarkers and endpoints.
**Topic: EMERGENCY MEDICINE, FUTURE PERSPECTIVES AND TECHNOLOGICAL DEVELOPMENT**

Preliminary comparative clinical study between serum procalcitonin, poct mbs method and urine sticks for a fast detection of urinary tract infections

V. Ferrante¹, V. Cellitti¹, A. Arienzo¹, F. Losito², A. Mari³, F. Cristofano¹, S. Di Somma³, P. Visca¹, G. Antonini¹-⁴
¹Department Of Sciences, University Roma Tre, Roma, Italy, ²Mbs Srl, Roma, Italy, ³Department Of Emergency Medicine, S. Andrea Hospital And Sapienza University Of Rome, Roma, Italy, ⁴Inbb Interuniversity Consortium Of Structural And Systems Biology, Roma, Italy

**Background:** The presence of urinary tract infections (UTIs) should be confirmed by urine culture that often requires long response times (1-2 days) while a rapid diagnosis is essential to avoid damage to the renal parenchyma. Procalcitonin (PCT) is produced ubiquitously in response to bacterial infections, such as UTI. The MBS method is a POCT device produced by MBS srl (Roma Tre University spin-off). POCT MBS method is based on a colorimetric test performed in single-use and ready-to-use reaction vials and it is able to make a diagnosis of UTI in less than 5 hours. Urine sticks are widely used for fast and cheap diagnosis of UTI when positive for both leukocytes and nitrite. Aim of this work was to analyze the effectiveness of the serum levels of PCT, POCT MBS method and urine sticks in diagnosing UTI in comparison with the long-lasting reference method of urine cultures.

**Methods:** Samples were collected from patients hospitalized in the Department of Emergency Medicine of the S. Andrea Hospital in Rome and were analyzed by the Hospital Laboratory for bacterial load in urine by traditional plate counting method and for the serum levels of procalcitonin. Urine samples were also analyzed with POCT MBS method and with urine sticks. PCT was taken as positive serum with a serum level of PCT equal or greater than 0.05-0.5 ng/ml (considered to be diagnostic of a bacterial infection focus), POCT MBS method was taken as positive when the bacterial load in urine is equal or greater than 10⁵ CFU/ml (limit for the diagnosis of UTI) and urine sticks were taken as positive when they showed positivity for both leukocytes and nitrite.

**Results:** Out of 31 patients with positive urine cultures, all of them were positive to PCT, 26 of them were positive to POCT MBS method and 8 of them were positive to urine sticks.

Out of 74 patients with negative urine cultures, 73 of them were positive to PCT, 70 of them were negative to POCT MBS method and 64 of them were negative to urine sticks.

**Conclusions:** In conclusion, the POCT MBS method was found to be a better rapid screening method for the detection of UTI in comparison with either serum procalcitonin levels or urine sticks.

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**Topic: ACUTE DISEASES MANAGEMENT**

The prediction of 1-year mortality risk in elderly patients admitted for congestive heart failure: a clinical score

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**Background:** Prognostic evaluation in patients with acute heart failure is particularly important especially when the choice of better setting of care have to be discussed with patients, families and caregivers.

The aim of this study is to assess the utility of a bedside clinical score in predicting clinical adverse events, in a cohort of elderly heart failure (HF) patients admitted to hospital for an episode of acute decompensation.

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<th>1 point</th>
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</tr>
</thead>
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<tr>
<td>Creatinine plasma level (admission)</td>
<td>&lt; 1.3 mg/dl</td>
<td>1.3-1.5 mg/dl</td>
<td>&gt;1.5 mg/dl</td>
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<tr>
<td>LVEF (admission)</td>
<td>&gt;45%</td>
<td>35-45%</td>
<td>&lt;35%</td>
</tr>
<tr>
<td>NYHA class (discharge)</td>
<td>I-II</td>
<td>III</td>
<td>IV</td>
</tr>
<tr>
<td>Barthel index (discharge)</td>
<td>&gt;=80</td>
<td>70-80</td>
<td>&lt;70</td>
</tr>
<tr>
<td>BNP (discharge)</td>
<td>&lt;500 pg/ml</td>
<td>500-900 pg/ml</td>
<td>&gt;900 pg/ml</td>
</tr>
<tr>
<td>MOCA score corrected for scolarity</td>
<td>&gt;=24</td>
<td>&lt;24</td>
<td></td>
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</tbody>
</table>
Methods: Forty-four elderly patients (14 females, mean age 76 years), consecutively admitted for acute HF, were studied. Besides demographic, clinical and laboratory data, functional information referred to disease severity (NYHA class, 6-minute walking test) and data on cognitive (MMSE, MOCA test) and behavioural state (GDS) were recorded; echocardiography evaluation and hydration analysis were performed. Adverse clinical events (decompensation of heart failure, hospital admission and death) were recorded after a follow-up period of 1 year. A clinical score, including creatinine plasma level, left ventricular ejection fraction (LVEF), NYHA class, BNP levels, Barthel index and corrected MOCA test, was calculated (Table 1). A score between 0 and 2 was attributed to each single element; the maximum score was 11. The total score was related to adverse events, especially 1-year mortality.

Results: During the follow-up period, six patients (13.6%) died; the mean time between index hospital admission and death was 2.8 months. The patients with a poorer prognosis, compared to alive subjects, showed a greater impairment of renal function (creatinine plasma level: 2.1±0.9 vs. 1.4±0.5 mg/dl, p=0.01), higher BNP (2904.3±2155.8 vs 886.8±1094.1 pg/ml, p=0.02) and RDW (19.1±3.0% vs. 16.3±1.7%, p=0.01), lower sodium sieric level (136.7±3.8 vs. 140.1±3.2 mEq/l, p=0.02), a higher hydration (84.7±3.8% vs. 77.5±5.9%, p=0.02), greater Barthel index and worse cognitive performance (MOCA test 13.3±4.3 vs. 17.9±4.9, p=0.03). A score more/≤ than 6 identified a one-year mortality risk with a sensitivity of 83%, a specificity of 84%, a positive predictive value of 65% and a negative predictive value of 97%; ROC curve presented an area under the curve of 0.84 (IC95%: 0.67 -0.99, p<0.01).

Conclusions: Our clinical score, including six parameters easily detectable at bedside, was able to predict with a good accuracy a one-year probability of survival in a cohort of elderly patients readmitted for HF. Studies on greater population are necessary to confirm these promising results.

Topic: ACUTE DISEASES MANAGEMENT

Enhanced adsorption dialysis: a new dialysis technique to treat acute cast nephropathy in multiple myeloma

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1Nephrology Clinic, San Gerardo Hospital, University Milano Bicocca, Monza, Italy

Background: Renal recovery in multiple myeloma (MM) cast nephropathy is correlated to an early reduction of serum free light chians (sFLC) concentrations obtained through chemotherapy combined to extracorporeal sFLC removal. We previously reported that polymethylmethacrylate (PMMA) membranes (BK-F; Toray Inc., Japan) can adsorb high quantities of sFLC especially with a new dialysis procedure called “enhanced adsorption dialysis” (EAD). During 4 hours EAD a specific designed circuit (implemented in our division Fig.1) allows to safely use 2 dialyzers sequentially without treatment interruption (Fig1). Nevertheless no clinical data are available on EAD efficacy in renal recovery. We report our experience of EAD treatment in incident MM patient with dialysis dependent renal failure.

Methods: we treated 12 incident patients with dialysis-dependent renal failure and high levels of sFLC. All patients had highly suspicious (n=8) or biopsy proven (n=4) cast nephropathy. In all patients a bortezomib based chemotherapy was started together with daily EAD treatment to...
reduce sFLC levels. Through daily sFLC measurement we scheduled dialysis treatments aiming to the greatest sFLC reduction in the shortest time. Renal outcome was measured as dialysis independence at 1, 6 and 12 months. Results are reported as average and (min-max) values.

**Results:** At presentation eGFR and sFLC levels were 9.7 ml/min (4.3-31.8) and 7868.5 mg/l (2300-25118) respectively. We performed on average 5 (1-8) EAD sessions for patient obtaining a sFLC removal of 36.7% /session (-13 to 71%). sFLC were reduced by 59.2%(0-92%) at 12 days and by 70.2%(0-99%) at 21 days. At present 11 out of 12 patients completed 1 and 6 months follow up while one patient died. At 1 and 6 month follow up 50% and 83.5% of patients recovered renal function respectively. Only 9 patients completed one year of follow up and we registered 78% of dialysis independence(1 dead and 1 ESRD).

**Conclusions:** PMMA enhanced adsorption dialysis together with bortezomib based chemotherapy was able to efficiently reduce sFLC levels and to promote an high rate of persistent dialysis independence

**Topic:** EMERGENCY MEDICINE, FUTURE PERSPECTIVES AND TECHNOLOGICAL DEVELOPMENT

**Medical wards organized by care intensity: effects on patient’s outcome of institution of high dependency unit (hdu) in medical ward**

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1 Dipartimento Di Medicina Dimed, Clinica Medica 1, Università E Azienda Ospedaliera, Padova, Italy

**Background:** High Dependency Units (HDU) existing in some Italian hospitals are part of a general reorganization according to a model based on intensity of care. This has represented so far a good response to the social-demographic changes of our country and the consequent need to avoid any waste of money and take care of old, polipathologic patients, suffering from chronic diseases. We still need to clarify how the admission to HDU can affect patient’s outcome and duration of hospital stay, and to establish the association between alteration of biochemical parameters and risk of a bad outcome (mortality/transfer to ICU).

**Methods:** Between June 2012 and December 2013 we recruited 120 patients from an internal medicine ward having a clinic instability index (National Early Warning Score = NEWS >4); 60 patients were followed in a high dependency area (cases = CA) and 60 in the normal intensity area (controls = CO). We also analyzed the association of clinical outcome, biochemical parameters and NEWS in a larger cohort of 249 patients admitted to the same ward between June 2012 and May 2014.

**Results:** The mean age of patients was 80 years, 60% were women. The most frequent causes of admission were heart failure, respiratory failure and sepsis. There was no statistically significant difference neither in mortality (23.3 vs 23.3%; CA vs CO; p = 0.80) nor in the average duration of stay (11±7 vs 10±7 days; CA vs CO; p = 0.67). However, a statistically significant difference was found in mortality of patients admitted because of sepsis (21.4 vs 100%; CA vs CO; p = 0.03); this demonstrated how the outcome of septic patients is positively affected by admission to a HDU. Alteration of the following biochemical parameters had a significant negative impact on patient’s outcome: leukocytes (p = 0.0001), CRP (p = 0.0007), troponin (p = 0.0006), BNP (p = 0.0005), INR (p = 0.0008), creatinine (p = 0.002), blood glucose (p = 0.008). All these parameters had a significant correlation with NEWS: leukocytes (r = 0.209, p = 0.0009), CRP (r = 0.401, p < 0.0001), troponin (r = 0.296, p < 0.0001), BNP (r = 0.302, p = 0.0003), INR (r = 0.294, p < 0.0001), creatinine (r = 0.281, p < 0.0001), blood glucose (r = 0.201, p = 0.002).

**Conclusions:** The benefits on patient’s outcome of hospitalization in HDU are evident so far for patients admitted because of sepsis. It is therefore necessary to further work on ward’s management, in order to extend the positive effects to patients with other diseases.

**Topic:** EMERGENCY MEDICINE, FUTURE PERSPECTIVES AND TECHNOLOGICAL DEVELOPMENT

**CTA scans in early stroke patient (within 4.5 h). Neuroimaging findings and correlation with clinical outcome after fibrinolytic therapy**

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1 Nesmos Department, Neuroradiology - University Of Rome, Sapienza, Roma, Italy, 2 Neuroradiological Academic Unit, Department Of Brain Repair And Rehabilitation, Ucl Institute Of Neurology Queen Square, London, United Kingdom

**Background:** Noncontrast Computed Tomography (NCCT) is the standard diagnostic protocol for patients suspected of stroke in most hospital worldwide. Since this exam doesn't provide informations concerning the status of the intracranial vessels Computed Tomography Angiography (CTA) was tested to understand whether this exam can improve stroke patient’s management.
Methods: We retrospectively analyzed images (NCCT at arrival and at 24h and CTA at arrival) of 86 patients with a clinical diagnosis of stroke involving the anterior circulation. All patients had been assigned a NIHSS score at arrival and at 24h and received fibrinolytic therapy within 4.5h. On NCCT and CTA we calculated ASPECTS. On MIP reconstructions, an estimate of collateral score. In addition we have obtained the PBV parameter (a surrogate of cerebral blood volume) and, on that, we calculated ASPECTS. We divided the patients in two subgroups: those with an occluded vessel and those without occlusions. We correlated all ASPECTS with NIHSS values and the Collateral Score with the clinical outcome.

Results: Of 86 patients 56 (65.11%) did not show any occlusion at the CTA. T-student test showed statistically significant difference ($p = .001$) between mean ASPECTS values on NCCT (8.42), CTA (7.65) and PBV (4) in occluded subgroup. The same test did not show any difference between mean ASPECTS values in not occluded subgroup. Correlation between ASPECTS (on NCCT and PBV) and both NIHSS values showed that PBV is the only statistically significant parameter in both subgroups. Correlation between ASPECTS at arrival and ASPECTS at 24h has demonstrated that both NCCT and PBV are significant in occluded subgroup. Analysis of Collateral Score showed only one patients with no collateral (CS=0), 9 patients with CS=1, 8 patients with CS=2 and 9 patients with CS=3. Correlation between Collateral Score and clinical outcome showed CS=2 as the only statistically significant value.

Conclusions: CTA is a fast and easily achievable exam that does not delay the start of fibrinolytic therapy. In our study we found that most of the patients treated with fibrinolytic therapy did not show vessel occlusion. Collateral Score is a predictor of clinical outcome, since only patients with good collaterals benefit from the fibrinolytic therapy. Finally we found that PBV is a valid parameter to predict both clinical outcome and infarct volume in stroke patients.

Topic: EMERGENCY MEDICINE, FUTURE PERSPECTIVES AND TECHNOLOGICAL DEVELOPMENT

Single-incision laparoscopic appendectomy is comparable to conventional laparoscopic and laparotomic appendectomy: our single center single surgeon experience

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1Osp. Fiorini Polo Pontino La Sapienza, Terracina, Italy

Background: Laparoscopic appendectomy is now considered the gold standard for appendectomy(1). In numerous studies, when the conventional laparoscopic appendectomy (VL-A) is compared with laparotomy (O-A), it has advantages of reduced pain, reduced hospital stay and enhanced aesthetic effect (2). Multiple comparative analyses have recently described single-port surgery (3,4).

In this study we examine the application and the safety of SILS-A by comparing single-incision laparoscopic an appendectomy whit a conventional laparoscopic appendectomy and laparotomy.

FEATURES AND RESULTS.

<table>
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<tr>
<th>GENERAL CHARACTERISTICS</th>
<th>SILS-A</th>
<th>VLS-A</th>
<th>O-A</th>
</tr>
</thead>
<tbody>
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<td>Gender</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Female</td>
<td>12</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Male</td>
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<tr>
<td>Mean age(years)</td>
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Methods: The retrospective study involves 12 patients who received laparoscopic single-port appendectomy (SILS-A), compared with 14 patients who received conventional laparoscopic appendectomy (VL-A) and 12 patients who received laparotomic appendectomy performed by the same surgeon (C.F.) at a single institution. Written informed consent was provided by all the patients. Medical records were used to conduct a retrospective comparative analysis.

Results: Postoperative period was characterized by fever only in 4 (30%) of 12 cases of SILS-A, 6 (43%) of the 14 VLS-A and 5 (42%) in O-A. 58.3% of SILS-A had neutrofil leukocytosis in the 1st post-operative day (from 11.05 to 14.48 × 10³ u/l), as 42% in VLS-A (from 11.47 to 26.36 × 10³u/l), and 41.6% in O-A group (from 9.25 to 21.83 × 10³). The leukocytosis decreased in 2nd post-op day in all groups. Sutures of surgical wounds were removed in 8th postoperative day in all groups. None of the SILS-A patients show a wound complications. In VLS-A one case of FID abdominal wall abscess; a wound seroma in O-A. Mean hospital stay was 3,5 days in VLS-A, 4 days in SILS-A and in O-A. In immediate postoperative days we had a good pain control, as after the discharge. We observed postoperative complications in 1 (7,1%) of VLS-A, a pelvic peritonitis treated with laparotomy and abdominal drainage and discharged in 10th p.o.d.;

Conclusions: In conclusion, no significant differences were found when parameters compare between SILS-A an VLS-A, while an evident improvement shows versus O-A, even though not statistically significant. SILS-A and VLS-A showed not much difference in relation to surgical outcomes and performance, but SILS was more effective in decreasing the risk of postoperative wound infection. Because of the small number of patients compared between the three technique, supplementary studies need to performed in the future to acquire more objective results.

Topic: EMERGENCY MEDICINE, FUTURE PERSPECTIVES AND TECHNOLOGICAL DEVELOPMENT

Value of contrast-enhanced ct in detecting active hemorrhage associated to major pelvic trauma and guiding angiographic treatment


1Azienda Ospedaliera S.Camillo Forlanini, Rome, Italy

Background: In patients with major abdominal trauma, pelvic fractures associated to active hemorrhage are a common cause of hemodynamic instability. Therapeutic option depends on source and entity of bleeding: arterial hemorrhage requires angiographic embolization; the venous one or that from bone ends is treated conservatively with pelvic packing or external fixator. Our purpose is to establish the role of CT in the detection of active hemorrhage after major pelvic trauma compared to angiography.

Methods: Between 9/2010 and 12/2012, 773 patients with major trauma underwent a CT examination in emergency department. Pelvic fractures were present in 180/773 patients. In all patient affected by pelvic fracture the presence of pelvic hematoma, intra-or retroperitoneal and/
or in the soft tissue (glutes, adductors muscles), was searched. Authors look also for the presence of active contrast blush during the early arterial, the portal phase and near the stumps of bone fracture. Angiography was performed in 67 patients after CT detection of active bleeding or in case of not explained hemodynamic instability.

**Results:** Among 180 patients with pelvic injury, 163 showed a pelvic hematoma; 27 a soft tissue hematoma. At CT active hemorrhage was identified in 47/180 cases (29 bleedings were visible in the arterial phase; 9 in the venous one; 2 in both of them; 11 near bone ends). All 47 patients underwent arteriography who showed hemorrhage in 22/29 cases of arterial bleeding, 3/9 case of venous phase bleeding, 2/11 cases of bleeding near bone ends. 20 patients underwent arteriography without evidence of active bleeding at CT; 4/20 showed active extravasation of contrast material. 2/20 underwent internal iliac embolization even in absence of extravasation.

**Conclusions:** CT has high sensitivity to detect active bleeding and to establish its origin, thus guiding the optimal therapeutic option. Our experience suggest to perform arteriography even in case of bleeding from bone ends or of venous origin, and when there is an hemodynamic instability without relevant CT findings.

**Topic:** RESEARCH IN EMERGENCY MEDICINE

**Interim analysis of the need-speed trial: epidemiology of patients with sirs criteria in different settings**

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**Background:** Patients with Systemic Inflammatory Response Syndrome (SIRS) at presentation may suffer from sepsis, a leading cause of mortality in hospitalized patients. Around 50% of European patients with sepsis are managed in the emergency departments (ED), while the remaining, based on severity of the condition, prognosis, and patients’ frailty, are admitted in medical wards (MW). Whether patients with SIRS criteria in ED and MW have different presentation, management and clinical outcome is not well known. Such an uncertainty, should discourage from application in MW of diagnostic and therapeutic approach conducted in the emergency departments.

**Methods:** NEED-SPEED trial is a prospective multicenter study for the identification of biomarkers of sepsis among patients with SIRS clinical presentation. The present interim analysis focuses on characteristics of inclusion criteria, comorbidities, management and outcome between SIRS patients admitted into an ED and those in MW of 5 Italian hospitals.

**Results:** From March 1th 2013 until August 20th 2014, 439 patients have been enrolled and validated by an independent committee. They were mainly men, and vast majority (86%) were above 65 years of age.

Admission criteria: ED patients were more feverish, while tachypnea was the most frequent disorder of MW group. Around 20% had already been taking an antibiotic at home.

Comorbidities: heart failure, cerebrovascular disease and hemiplegia were the most frequent comorbidities in MW, this significantly increasing also the Charlson score in this group. Glasgow coma scale was higher in MW patients, while SOFA score was overlapping between the two groups.

Diagnosis: the prevalence of sepsis among SIRS patients was around 85%, in both ED and MW groups; 30% suffered from severe sepsis and 7% of septic shock, again with no difference between ED and MW. Among the microbiologically proven sepses, patients with more than one microorganism growing were mainly from MW.

Mortality: in patients with non-infective SIRS, all causes mortality was similar in ED and MW groups at 7 and 30 days, while in those with sepsis, prevalence of mortality in ED was slightly higher at 7 days after admission, but not at 30 days.

**Conclusions:** This first “ad interim” report shows that, in spite of different clinical presentation and comorbidity, patients with SIRS criteria show an overall similar outcome when compared to the department of admission.

**Topic:** EMERGENCY MEDICINE, FUTURE PERSPECTIVES AND TECHNOLOGICAL DEVELOPMENT

**Prediction of cerebral and cardiovascular events by a smart intelligence method**

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**Background:** There is consensus that Heart Rate Variability is associated with the risk of vascular events. However, Heart Rate Variability predictive value for vascular events is not completely clear. The aim of this study was to develop novel predictive models based on data-mining algorithms to provide an automatic risk stratification tool for hypertensive patients.
**Methods:** A database of 142 Holter recordings with clinical data of hypertensive patients followed up for at least 12 months were collected ad hoc. Subject who experienced a vascular event (i.e. myocardial infarction, stroke, syncopal event) were considered as high-risk subject. Several data-mining algorithms (such as support vector machine, tree-based classifier, artificial neural network) were used to develop automatic classifiers and their accuracy was tested by assessing the receiver-operator characteristics curve. Moreover, we tested the echographic parameters which have been showed as power predictors of future vascular events.

**Results:** The best predictive model was based on artificial neural network and enabled to identify high-risk hypertensive patients with sensitivity and specificity rates of 94.1% and 88.0%, respectively. The Heart Rate Variability based classifier showed higher predictive values than the conventional echographic parameters, which are considered as significant cardiovascular risk factors.

**Conclusions:** Combination of Heart Rate Variability measures, analyzed with data-mining algorithm, could be a reliable tool for identifying hypertensive patients at high risk to develop future vascular events.

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**Topic: RESEARCH IN EMERGENCY MEDICINE**

**Variation in clinician reported pretest probability and chest X-ray interpretation in dyspneic ED patients with potential acute heart failure: experience doesn’t matter**

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**Background:** Acute heart failure (AHF) is one of the most important conditions treated by emergency physicians yet uncertainty for the diagnosis remains common. How much this relates to variability in clinician derived pretest probability of AHF and divergence in associated chest x-ray (CXR) interpretation is not known.

**Methods:** This was a subanalysis of a prospective multicenter, randomized trial evaluating prediction-model based natriuretic peptide use in ED patients with undifferentiated dyspnea (NCT01193998). Patients assigned a pretest probability of AHF between 21% and 79% served as the target population. Those with dyspnea due to chest trauma or chronic obstructive pulmonary disease (COPD), and those with renal failure or acute coronary syndrome (ACS) within one month were excluded. All enrolled patients were evaluated by two ED physicians and agreement for a diagnosis of AHF was determined by the % net reclassification in pretest probability for the 2o (vs. 1o) ED physician. Level of agreement was further assessed by Bland Altman analysis and calculation of intraclass correlation coefficient (ICC). Lastly, we compared agreement for CXR findings of AHF and COPD between ED physicians and between ED physicians and radiologists using Fleiss’ Kappa statistic.

**Results:** 154 patients (mean age 63 years; 36% male; 49% and 43% with a history of HF and COPD, respectively) were enrolled at 4 different sites. The 1o physician (100% faculty; avg work experience = 14 years) average pretest probability of AHF was 48%; for 2o physicians (25% staff [avg work experience = 10 years] and 75% post-graduate trainee [avg work experience = 2.2 years]) it was 49%. Net reclassification was 17% with 7% changing to a pretest probability of less/equal to 20% and 10% to greater/equal to 80%. There was modest agreement for pretest probability on Bland-Altman analysis (Figure) and on ICC (0.717). However, as shown by Fleiss’ Kappa calculations, agreement for all CXR findings between 1o/2o ED physicians and ED physicians/radiologists was poor (Table).

**Conclusions:** Among ED patients with undifferentiated dyspnea and an intermediate likelihood of AHF, agreement on pretest probability between 1o and 2o ED physician evaluators was moderate with a relatively low rate of net reclassification but agreement on CXR findings was poor. Of note, neither clinical estimate of AHF nor radiographic interpretation differed by years of work experience.
**Topic: THE HEALTH-SOCIAL ROLE OF EMERGENCY MEDICINE**

The role of emergency department in a chronic disease: osteoporosis

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**Background:** Osteoporosis is a complex pathological condition characterized by low bone mass and qualitative alterations of macro and micro-architecture of bone which is associated with increased risk of fracture even in case of modest trauma. The incidence of osteoporotic fractures increases with age, especially and abruptly in women in post-menopausal period. It is estimated that in Italy there are now about 3.5 million women and 1 million men affected by osteoporosis. In the next 20 years the percentage of the Italian population above 65 years will increase by 25%, as a result we should expect a proportional increase in the incidences of osteoporosis. The most affected sites are the spine, femur and wrist.

**Methods:** We analyzed data from patients older than 50 years with hip, vertebral and wrist fractures treated at the E.D. of Esine-Edolo Hospital starting from January 2014 until June 2014. We evaluated if the lesion was osteoporotic, if patients were in treatment, and if the physicians, who had visited them, prescribed the therapy or provided the necessary information.

**Results:** These patients have a high incidence of osteoporosis. The majority of them were not treated pharmacologically and the risk of fracture was not perceived either by patients nor by physicians, unlike, for example, the cardiovascular risk. This is our current situation although osteoporosis now represents a disease of social importance affecting the majority of the population beyond the eighth decade of life.

**Conclusions:** Because of the high number of patients seen in our E.D., we have created a quick and simple questionnaire to evaluate the risk of fracture for the patients over 50 years old who come to our emergency department, with the aim to make our patients and physicians aware of the disease, so that a prevention can be made, and a diagnostic process or treatment can be started. In this way, we would reduce the incidence of osteoporotic fractures.

### Table

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**Topic: THE HEALTH-SOCIAL ROLE OF EMERGENCY MEDICINE**

Investigation on IPV: the progetto ginestra in the ER of the Galliera hospital

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**Background:** IPV (Intimate Partner Violence) is a serious public health problem that affects millions of women [European Agency for Fundamental Rights, 2014]. The investigation started in 2010 in the ER of Hospital Galliera in Genoa and is part of the “Progetto Ginestra” that is about the psychological, physical and/or sexual abuses, repeated in time and within intimate relationships (family/friends) and school or work context. The project focuses mainly on IPV patients and the main goals are clinical and statistical to identify and evaluate the main risk factors associated to IPV.
Methods: The project is based on the statistical analysis of the data provided by the patients involved in the project and that gave their consent to participate to the pathway offered in the Galliera ER that includes a counseling with the psychologist. The counseling allows the psychologist to collect important data about the victim, the aggressor and the circumstances of the violence. In particular, the psychologist fills an anonymous questionnaire composed of 82 questions divided in 5 different sections:
1) anagraphic details and medical record
2) victim profile, personal information
3) characteristics and context of the violence
4) aggressor profile
5) collaboration with the local network for a holistic approach

Results: The investigation focuses mainly on the violent episode affecting women, repeated in time, by the husband-partner. The first data analysis, that included 329 episode of IPV, showed that victims are between 40 and 49 years old (27%), has no children (42%) and the aggressor is the husband (40%). 60% of them is Italian and 40% is foreign. Moreover, there are significant statistical differences about work condition, income and education.

The principal diagnosis is contusion/hematoma/bruise (22%), trauma (19%), traumatic brain injury (17%) and anxiety (16%).

Conclusions: Through the implementation of a Protocol that outlines health care and treatment and the collection of data about the victims of violence, the ER has become a privileged monitoring unit for IPV. The integration of clinical data with the one provided by the psychologist through the counseling allows to identify risk factors associated to the episode of IPV, to provide proper indication about the prevention of this phenomenon and as a consequence to implement good practices within the Emergency Departments.

Topic: EMERGENCY MEDICINE, FUTURE PERSPECTIVES AND TECHNOLOGICAL DEVELOPMENT

Implementation of a lean model in the ER of Galliera hospital for IPV patients health care

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Background: Since 2010, the ER of Galliera Hospital in Genoa has started the “Progetto Ginestra” about reception, care and support for victims of intimate partner violence (IPV) who access the ER, with reference to women and minors. In 2012 a new Protocol was introduced in the Hospital. It includes an appropriate, lean, multydisciplinary and competent pathway based on the Lean Model introduced for the first time by Toyota.

The main goal of the Lean Model is the reduction of wasted resources (money, waiting time, spaces, repeated action), to guarantee a better efficiency, quality and better answer to specific needs of IPV patients. IPV patients are constantly followed by medical, nursing and psychological staff from triage until they are sent to the local network. The psychologist, after a counseling, fills out a questionnaire to evaluate the patient condition, the characteristics of the violence and the type of pathway in the ER. Thanks to the questionnaire it was possible to verify the efficiency of the Lean Model.

Methods: Two principal devices have been introduced:
1) the “Value stream map”
2) the statistical analysis
The main goals were: to understand better the IPV phenomenon to create an appropriate pathway; to involve more and more patients in the project; to improve the patient medical care and to reduce the waiting time; to improve the relational skills of staff with the patient during the triage, the medical examination and the psychological assessment.

Results: The data collected during the psychological assessments in 2011 were compared to 2013. In 2011, IPV patients who accessed in the ER were 370. 68 out of 370 accepted the counseling with the psychologist. 44 of them were Italian and 24 foreign.

In 2013, they were 95, 52 Italian and 43 foreign.

The majority of the IPV patients was between 30 and 45 years old.

From the data collected it was underlined that the waiting time was reduced to 0-30 minutes (58% in 2013 and 44% in 2011). Only 13% in 2011 and 4% in 2013 had more than 3 hours of waiting time.

Conclusions: The Project is a good model for secondary prevention, assessment of risk factors and start of new pathway to protect and cure the victims of abuse and violence.
**Topic: CARDIOVASCULAR CRITICAL CARE MEDICINE**

**Capecitabine induced angina: a case report**

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**Background:** Capecitabine is an oral prodrug of 5-fluorouracil and it is commonly used in the treatment of multiple cancer types because of its convenient oral administration and favorable pharmacokinetics. Although cardiac toxicity of 5-FU is well known, capecitabine induced cardiotoxicity has been reported rarely, and in few cases the occurrence of coronary vasospasm has been described.

**Methods:** Case report.

**Results:** Case presentation: A 49 years-old woman with no known cardiovascular risk, treated with capecitabine for a stage IV colon adenocarcinoma, was admitted to the ED for a chest pain episode associated to nausea and dyspnoea. In the emergency room the patients was completely asymptomatic and hemodynamically stable. ECG and Troponin I were within the normal limits. She was admitted to the emergency medicine unit where she further complained of chest pain with ST-T depression in V1-V3 and diffused peaked T waves at the ECG. She was treated with nitroglycerin, ASA and LMWH with complete regression of symptoms and ECG changes within 20 minutes. Troponin I remained within the normal range and echocardiography revealed a transient mild hypokinesia of the basal inferoseptal and anteroseptal wall with preserved EF. A coronary-CT angiography was performed showing a normal coronary artery tree. Hence therapy with capecitabine was discontinued and a calcium channel blocker (verapamil) was introduced. The patient was discharged a few days later completely asymptomatic.

**Conclusions:** Although the true incidence of cardiotoxicity has not been well defined it may occur more frequently than previously reported. Cardiotoxicity is transient and often reversible, but capecitabine must be withdrawn or at least re-evaluated with the oncologist. Therefore emergency physician should be trained to promptly recognize it, as cause of chest pain, in order to start the most adequate treatment.

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**Topic: THE HEALTH-SOCIAL ROLE OF EMERGENCY MEDICINE**

**Sub intensive care unit (SICU) as a model of health economics?**

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**Background:** In acute care hospitals can be selected a patient population not requiring intensive care, but a better management than provided in regular ward (1). Especially elderly with a mean age > 70 years, presence of chronic conditions, high frequency of co-morbidity, high complexity, poly pharmacotherapy and fragility, are managed in areas not appropriate in terms of staff resources, service, technology and space. After hospitalization, patients presenting with critical clinical conditions, may have a worse prognosis if treated in regular ward, compared to those who deteriorate in ICU (2). Some Authors also suggest that the survival of critically ill patients admitted to SICU, in a situation of shortage of ICU beds, it could be better (3).

**Methods:** We evaluated the management of all patients admitted to SICU comparing 2012 and 2013 data.

**Results:** In 2012 were hospitalized 489 patients (253 males – 51.7% and 236 women - 48.3%), mean age 73.8 y, mean SAPS II 39.2, median stay 3 days, with 0.98 occupancy rate, 81.50 turnover rate, mortality 13.50% and ICU transfer rate of 11.5%. In 2013 470 patients (256 males – 54.4% and 214 women - 45.6%), mean age 72.7 y, mean SAPS II 37.6, median stay 3 days, with 1.0 occupancy rate, 78.33 turnover rate, mortality 14.0% and ICU transfer rate of 11.7%. The main group of admitted to SICU was patients with acute and critical respiratory failure due to COPD and pneumonia, which accounted for 33.9% of total admissions in 2012 and 30.8% in 2013.

**Conclusions:** If daily cost of ICU bed can be up to € 1500 and significantly lower for the SICU (4) the objective of the creation and expansion of these units could lead, reducing direct and inappropriate ICU accesses, to a reduction of the total hospitalization cost. Especially in patients with COPD exacerbation, management with usual medical care and non-invasive ventilation, reducing the length of stay, the need for orotracheal intubation and improving survival (3), could lead to a reduction for the inappropriate ICU access, with repercussions on the health care management costs.

**Topic: RESPIRATORY CRITICAL CARE MEDICINE**

Acute respiratory failure in the elderly fragile: two-year experience in copd management

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1Uoc Medicina D’urgenza e Cure Differenziate H. San Camillo, Roma, Italy

**Background:** Actually critical patients are managed in areas not appropriate in terms of staff resources, service, technology and space. Common experience is the hospitalization of the elderly with a mean age > 70 years, presence of chronic conditions, high frequency of co-morbidity, high complexity, poly pharmacotherapy and fragility. In acute care hospitals, however, can be selected a patient population, fragile, not requiring intensive care, but a better management than normally provided in a regular ward, with frequent monitoring of vital signs and necessity of particular therapeutic and nursing interventions (1).

**Methods:** Patients, border line and particularly complex, could be managed in a Sub Intensive Care Unit (SICU), such as the elderly with acute respiratory failure secondary to COPD exacerbation. We evaluated the management of patients admitted to SICU with acute respiratory failure, comparing 2012 and 2013 data.

**Results:** In 2012 were hospitalized 489 patients (253 males - 51.7% and 236 women - 48.3%), mean age 73.8 y, mean SAPS II 39.2, median hospital stay 3 days: 202 patients (41.3%) with acute respiratory failure (54 % COPD exacerbation, 28.7% pneumonia and 12.4% pulmonary embolism). In 2013, 470 patients were hospitalized (256 males -54.4% and 214 women - 45.6%), mean age 72.7 y, mean SAPS II 37.6, median hospital stay 3 days: 185 patients (39.4%) with acute respiratory failure (55.1 % COPD exacerbation, 28.6% pneumonia and 2.2% pulmonary embolism). According to guidelines (2) in the COPD group was performed an usual medical therapy and non-invasive ventilation (NIV), with an increase in the values of PH (normal range) and improvement in PaO2 / FiO2 (> 200) in 59.3% of patients treated in 2012 and 61.6% of patients in 2013.

**Conclusions:** Critically ill patients hospitalized in SICU, in a situation of shortage of ICU beds, may show a better survival comparing with those admitted to regular ward and ICU (3). The use of the combined approach of medical therapy and NIV in SICU, reducing oro-tracheal intubation and improving survival (2), would be effective not only through the reduction of respiratory muscle fatigue and improve gas exchange but especially when performed by a well-trained physicians and nurses team.


**Topic: TRAUMA AND MAXI EMERGENCIES**

The first aid in the circuit and the hospitalization: two realities that need to communicate in a renewed way

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**Background:** The driver’s trauma treatment in a modern circuit, has nowadays achieved high levels of skills and efficiency. The organization of an international motor or motorcycle race, the presence of top teams, the media interest, led to a rise in quality standards of medical service.

What, above all, distinguishes the rescue in a circuit from the territory one’s is the time interval: if 3-5 min. are considered a correct result for national emergency service 118, in a racetrack, under live closed Tv circuit control, the maximum tolerance is about 30-45 seconds.

**Methods:** The time factor has necessitated a revision of the emergency guidelines, preferring the line of stay and play, rather than the immediate transport to the nearest Hospital, because of the resuscitation equipment available and the doctor’s skills. The staff of the National Service of 118 identified the differences in terms of approach and organization of first aid, changing, in case of motor and motorcycle sport assistance, their own guidelines.

**Results:** For this reason, the CSAI (Italian Motor Sport Commission) under the auspices of the ACI ( Italian Automobile Club), in accordance with the guidelines of the FIA (Federation Internationale de l’Automobilisme), identified three circuits, Monza, Vallelunga and Bari, for training doctors, nurses, rescue workers, volunteers of Civil Protection, in the different emergency theatres and the specific maneuvers of driver’s disengaging and extrication.

**Conclusions:** The circuit’s area Hospitals still remain in a borderline position when, during the most important events, are involved up to 150 people, to guarantee the emergency service, as well as numerous vehicles (ambulances, fast cars) and helicopter. The possibility to communicate directly between the chief medical doctor (CMO) and the hospital’s first aid would allow the optimization of the golden hour, avoiding transport in inadequate or too crowded hospitals. Rx, TC and e-fast, in circuit’s equipped medical center, could economize hospitals cost and time, shortening the diagnostic and therapeutic course.
**Topic:** THE HEALTH-SOCIAL ROLE OF EMERGENCY MEDICINE

The incidence of epistaxis episodes is strongly associated with mean temperature variations. Results of a ten-year survey in a large urban emergency department

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**Background:** Several disorders, such as renal colics, atrial fibrillation, psychiatric emergencies and others, are epidemiologically associated with seasonality and microclimatic variations. Epistaxis accounts for about 1 in 200 ED visits in the United States. Some Authors have shown a correlation between epistaxis and seasonality, with higher incidence during wintertime (4,5), but the data are poor and somewhat conflicting (6). Aim of this study was to assess the influence of day-by-day climate changes on the number of epistaxis-related visits in the ED of the University Hospital of Parma, in northern Italy.

**Methods:** All the cases of epistaxis episodes were retrieved from the ED’s database during a period of 3653 days (January 2003 to December 2012). Only the cases whose onset was recorded within 12 hours from ED visit were selected. For all the 3653 observed days, the meteorological data about the Parma Province were obtained from Environment and Climate Regional Agency. We therefore checked for correlation between epistaxis-related visits and variation of mean air temperature. The chronological data of all the selected cases were interfaced with the climate data in an univariate linear regressions analysis using the program Mathematica®.

**Results:** Our ED recorded 819,590 visits over the observational period, with an average of 224 patients per day. A total of 5,443 epistaxis cases were observed during the study period, being males 56%, and females 44% (mean age 63±21 yrs). During all the observational period significant peaks of epistaxis episodes have been observed in winter, showing a clear seasonality. We demonstrate the existence of a strong significant inverse correlation between the average number of daily visits for epistaxis and the daily change of average temperature (R²=0.92; p<0.001).

**Conclusions:** The incidence of epistaxis episodes is strongly associated with mean temperature variations, showing peaks during wintertime. There is also a strong negative correlation with changes of the mean temperature. Further studies are needed to clarify if comorbidities and drug therapies could influence these findings.

**Topic:** EMERGENCY MEDICINE, FUTURE PERSPECTIVES AND TECHNOLOGICAL DEVELOPMENT

Preliminary evaluation of the poct mbs method to assess the antibiotics susceptibility of bacteria causing urinary tract infections (UTI)

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**Background:** The presence of a urinary tract infection (UTI) and the susceptibility/resistance to antibiotics of its etiologic agent should be assessed in the shortest time possible to start the most appropriate therapy. A rapid test performed at the Point of Care (POCT) could achieve these objectives. MBS srl (Roma Tre University spin-off) has developed a new POCT microbiological device for the diagnosis of UTI. The analytical results on the bacterial load into urine provided by POCT MBS method were very similar to the analytical results provided by the traditional method of urine culture carried out by the Hospital laboratory, demonstrating that POCT MBS method can provide a diagnosis a UTI in less than 5 hours. The aim of this work was to demonstrate the possible use of the POCT MBS method for a qualitative analysis of the susceptibility/resistance of bacteria detected in urine, providing in short time information on the specific antibiotic therapy to be administered.

**Methods:** Urine samples were collected from patients hospitalized in the Department of Emergency Medicine of the S. Andrea Hospital in Rome and were analyzed both with the POCT MBS method using vials supplemented of antibiotics in the same Department of Emergency Medicine and with the traditional antimicrobial susceptibility tests in the Hospital Laboratory. The analytical results by POCT MBS methods were obtained in 5 hours, while the traditional antimicrobial susceptibility tests in the Hospital Laboratory provided analytical results after several (3-5) days.

**Results:** The comparison between the results of the two methods: on a total of 34 patients positive for a UTI, in 18 cases there was a full correlation between the two methods as concerning antibiotic susceptibility/resistance of the bacteria detected in the urine. In 16 cases there wasn’t full agreement, possibly because the very high level of bacteria in some urine samples resulted in an analytical time of the POCT MBS method too short to allow the antibiotics effect on bacteria.

**Conclusions:** In conclusion, encouraging results were obtained, demonstrating the great potential of the POCT MBS method to evaluate the susceptibility/resistance of bacteria in the urine. The research will continue to achieve a better correspondence between the POCT MBS method and the traditional antimicrobial susceptibility test, even though the analytical time could possibly increase.
### Topic: ACUTE DISEASES MANAGEMENT

**Acute abdominal pain in an emergency department of a university hospital in Italy**

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**Background:** Acute abdominal pain (AAP) is one of the most common reasons for referral to an Emergency Department (ED), but information on its impact on emergency care activities is limited.

Aims of this work were to define the prevalence of AAP among ED visits of a University Hospital and to analyze its main clinical features.

**Methods:** All patients admitted at the S. Orsola–Malpighi University Hospital of Bologna ED on 12 a priori selected sample-days in 2013 were included. Clinical data were obtained from the ED clinical record databases. Gender, nationality, year of birth, triage severity code, ambulance transportation and chief complaint at admission were recorded for each patient. Furthermore, 192 clinical variables were recorded for each patient referred to the ED with AAP.

**Results:** During the observed period the ED assisted 2667 patients with a mean ± SD daily admission rate of 222 ± 19.6. Of these, 249 patients presented AAP (prevalence = 9.3%), with a higher prevalence on holidays vs workdays (10.1% vs 8.9%; \(P=0.008\)). Compared to patients with other complaints, AAP patients were younger (median age 43 vs 58 yrs; \(P<0.001\)), more frequently females (59.0% vs 50.0%; \(P=0.006\)), more non-native (19.7% vs 12.6%; \(P=0.003\)), and classified with higher severity admission codes (\(P=0.016\)). The most frequent ED operative diagnoses were: non-specific abdominal pain (n=91, 36.5%), GI tract related pain (n=83, 33.3%; n=20 upper GI, n=63 lower GI), urogenital related pain (n=52, 20.9%), hepatopancreatic related pain (n=23, 9.2%).

**Conclusions:** AAP is a common cause of referral EDs. Despite technological advances, non-specific abdominal pain is still the main operative diagnosis in ED. Analysis of AAP features can help to improve management strategies in emergency care.

### Topic: ACUTE DISEASES MANAGEMENT

**Chest pain. A case of heterotopic pregnancy**

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**Background:** Heterotopic pregnancy (HP) was first described in 1078 (1) and it’s incidence is estimated approximately 1/30000 pregnancies (2). Clinical symptoms can be misleading.

**Methods:** A woman, 35 yo, presented to the ED reporting acute chest pain (ACP), shoulder tip pain (STP), nausea and vomit. She reported regular menstruation.

PMH: 2 pregnancies.

Physical examination: BP 130/80 mmHg, HR 100/min, O2 saturation 99%. NRS 5. Normal cardiac and thoracic objectivity. Abdomen not painful nor tender, negative Blumberg and Murphy signs.

Blood tests: WBC 13,300/mm3, Hgb 13,4 g/dl, CRP , negative D-Dimer and Troponine I.

ECG: negative for ACS, STEMI, NSTEMI.

Chest X-RAY: no consolidations, no pleural effusion, normal cardiac shadow.

Abdomen U.S.: little free fluid in Douglas pouch.

Therapy: Ranitidine, Metoclopramide and Tramadol in normal saline solution.

After the therapy the patient referred pain remission and got discharged with the suggest to assume pain relief therapy, antiemetic and PPI.

She returned in the ED 15 days later, reporting ACP.

Physical examination was unchanged, vitals signs were stable and blood tests showed slight anemia (Hgb 11,7 g/dl), WBC 11100/mm3, CRP 2,51 mg/dl, negative D-Dimer and Tni. ECG and chest X-RAY were normal. Heart US: Minimum posterior pericardial separation.

Suspecting a pericarditis, the patient was kept in the ED. During the night she referred abdominal pain. In the morning abdomen was painful in hypogastrium and abdomen US showed plentiful free fluid. HGB dropped to 8,8 g/dl, so a contrast CT scan was performed. It showed free blood, possible left retroperitoneal hematoma and thickening of the uterus walls. B-HCG was 5591 mIU/ml and a gynecologist visit was performed. Transvaginal US showed an intrauterine pregnancy and equivocal left tubaric pregnancy.

**Results:** The patient was then taken to the OR to perform an uterine revision and left salpingotomy.

The discharge letter reported an intrauterine non evolutive pregnancy and an ectopic left tubaric pregnancy (HP) with hemoperitoneum.

**Conclusions:** HP may present with nonspecific findings, including STP, caused by diaphragmatic irritation due to intraperitoneal bleeding (3). The pain radiates to the shoulder even in 20% of patients with hemoperitoneum (50 to 3500 mL) (4). The emergency physician should never underestimate the potential life-threatening HP in fertile female patients with typical (abdominal tenderness and pain) and atypical (ACP and STP) presentation.
**Topic: ACUTE DISEASES MANAGEMENT**

**Beware of cervical trauma**

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**Background:** The cervical spine is involved in 60% of cases in spinal trauma. The lesions of the odontoid are a relatively common even representing more than 60% of fractures involving the Axis which in turn are the 10-18% of all cervical spine fractures.

**Results:** A 74 years old woman had an accidental fall from stairs at 5:30 a.m., coming at our observation 2 hours later the accident, she had a short time of loss of consciousness. Clinical story of chronic ischemic heart disease in pharmacological treatment and history of benzodiazepines abuse. She complained of dizziness and pain at right knee, cervical and lombar spine, swelling at right hand; the physical and neurological examination were normal. The patient was subjected to RX scan without evidence of fractures and cerebral CT scan without evidence of extra or subdural hematomas, intraparenchymal or subarachnoid hemorrhages and fracture of braincase and splanchnocranium. The cervical spine was examined also with CT scan with detection of fracture at base of dens at its attachment to body of C2 involving the left lateral masses (type III). The displacement of fractured dens determined spinal canal reduction. No paravertebral or epidural hematomas. At lab tests only mild leukocytosis and elevation of CPK. The patient was evaluated by the neurosurgeon and subsequently admitted to the neurosurgery and underwent conservative therapy.

**Conclusions:** It’s has to be supposed that all patients, with blunt trauma of the neck and head, have a spine injury, especially if there is compromised sensorium. Until the contrary is proved, the column must be adequately protected until a possible lesion has not been identified, stabilized or excluded. Anderson and D’Alonzo created a classification: type I: fracture of the upper part of the odontoid dens; type II: fracture at the base of the odontoid dens; and type III: fracture affecting the body of the axis. Treatment is guided by the type of odontoid fracture. It’s fundamental to exclude cervical lesions with the worst prognosis as C1 fracture or dislocation atlantoaxial epistrofiea. Pure C1-C2 dislocations, are rare because they can only be caused by a violent flexion mechanism with rupture of the transverse ligament, projection of the odontoid dens to the neural canal, and spinal cord trauma that is generally incompatible with life.

**Topic: EMERGENCY MEDICINE, FUTURE PERSPECTIVES AND TECHNOLOGICAL DEVELOPMENT**

**Venous mesenteric ischemia and acute arterial mesenteric ischemia with reperfusion: similarities and differences**

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**Background:** Mesenteric ischemia that encompasses a broad spectrum of diseases due to an acute or chronic decrease of small bowel blood supply that may present occlusive (arterial-venous) or nonocclusive ethiopathogenesis. Despite advances in diagnosis and therapy, the overall mortality
from mesenteric ischemia remains high with rates reaching 80%. The findings of mesenteric ischemia caused by venous thrombosis are well described in literature. From the analysis of the available literature seems that reperfusion after acute arterial ischemia (Ischemia-Reperfusion) and mesenteric venous ischemia may present similar findings. This represents a challenging issue because these two conditions require different treatments. Early diagnosis is fundamental for a correct therapeutic approach in order to reduce mortality rates. The aim of this study is to compare the VMI (venous mesenteric ischemia) and I-R (Ischemia-Reperfusion) pathways in an experimental model by using a 7 Tesla Magnetic Resonance Imaging (7T MRI) system, attempting to identify radiological findings that may help the surgeon in the distinction between these 2 conditions.

Methods: Thirty adult Sprague-Dawley rats were divided into 2 groups that then underwent different surgical models and ischemic damage monitoring. Group I was subjected to superior mesenteric vein (SMV) ligation whereas Group II underwent superior mesenteric artery (SMA) ligation followed by reperfusion after 1 hour. At different time-points (1 hour, 2 hours, 4 hours, 6 hours, 8 hours) 3 rats from each group were imaged by 7T MRI, euthanized and macroscopically-histologically analyzed.

Results: The hypotonic reflex ileus (HRI) was detectable only in I-R rats; congested mesentery was evident in the Group II rats, starting from the first hour after reperfusion, as well as in the Group I rats from the first hour after SMV ligation. In both groups free fluid was present; the bowel wall thickening and hyper-intense signal in T2-W sequence was visible in both groups from the second hour. Paralytic ileus (PI) was visible from the sixth hour and wall pneumatosis was observed in only 1 VMI rat from the eighth hour.

Conclusions: Results of this study suggest that radiological findings of SMV occlusion and reperfusion after arterial occlusion overlap except for the HRI detectable only in early stage of I-R.

**Topic: SEPSIS AN INFECTIOUS DISEASES**

**Epidemic meningoencephalitis (West Nile Virus)**

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**Background:** A 67-year-old man was suffering from first relapse of acute myeloid leukemia (NPM1 mutated) in re-induction chemotherapy, chronic ischemic and hypertensive heart disease. In September 2013 he was admitted to “Spedali Civili” Hospital in Brescia (North Italy) with fever and headache. During the hospitalization his level of consciousness deteriorated, he became lethargic, disoriented in space and time, presenting acute hypoxic respiratory failure, flaccid paralysis, mild rigor nucalis, bilateral nystagmus. Clinical parameters were: BP 130/80mmHg, HR 120bpm, steady pancytopenia at his level of consciousness deteriorated, he became lethargic, disoriented in space and time, presenting acute hypoxic respiratory failure, flaccid paralysis, mild rigor nucalis, bilateral nystagmus. Clinical parameters were: BP 130/80mmHg, HR 120bpm, steady pancytopenia at

**Methods:** Magnetic resonance imaging demonstrated severe encephalomyelitis and abnormal findings consistent with West Nile Virus (WNV). The diagnosis was confirmed by a positive WNV IgM in two different serum samples. Coma persists up to a poor prognosis. A sudden episode of generalized seizure followed by respiratory arrest required endotracheal intubation and moving to ICU. After lumbar puncture, the cerebrospinal fluid (CSF) was colorless, limpid, the protein was 83mg/dL, the glucose 159mg/dL, the cell count 14/mm3 predominately neutrophils, CSF direct microscopy examination and culture were negative.

**Results:** The WNV is a Flavivirus transmitted through the bite of mosquito (Culex species). It was first isolated in a febrile woman with flu-like symptoms in Uganda in 1937; since 2008 first cases had been recorded in Italy with neuroinvasive disease. Nearly all human infections of WNV are due to mosquito bites; other potential routes include transfused blood and transplanted organs. In humans, viremia is short-lived. There is currently no defined antiviral therapy for WNV infection. The treatment is prevention and supportive therapy (dehydration, pain control, neurological alertness monitoring, airway protection). There is no vaccine for humans.

**Conclusions:** The 2013 disease surveillance in humans in Lombardia (Italy) confirmed 10 native cases of WNV meningo-encephalitis occurred in August and September. The 30% of patients were aged between 45 and 65 and 9 out of 10 were male. Two patients, a 89-year-old male and 90-year-old female were admitted to “Spedali Civili” Hospital in Brescia (North Italy) with acute fever and headache. Coma persists up to a poor prognosis. A sudden episode of generalized seizure followed by respiratory arrest required endotracheal intubation and moving to ICU. After lumbar puncture, the cerebrospinal fluid (CSF) was colorless, limpid, the protein was 83mg/dL, the glucose 159mg/dL, the cell count 14/mm3 predominately neutrophils, CSF direct microscopy examination and culture were negative. In September 2013 he was admitted to “Spedali Civili” Hospital in Brescia (North Italy) with fever and headache. During the hospitalization his level of consciousness deteriorated, he became lethargic, disoriented in space and time, presenting acute hypoxic respiratory failure, flaccid paralysis, mild rigor nucalis, bilateral nystagmus. Clinical parameters were: BP 130/80mmHg, HR 120bpm, steady pancytopenia at

**Topic: BIOMARKERS IN ACUTE DISEASES**

**The relationship between hypertensive crisis and biomarkers**

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**Background:** The aim of this study is to detect the role of some biomarkers (BNP, and NGAL) in the course of hypertensive crisis in an emergency setting; to evaluate their possible role in the differential diagnosis between hypertensive emergencies or urgencies and to investigate the relationship between their concentrations and blood pressure.

**Methods:** We studied, for a period of 3 months, 28 patients (M/F 17/11; mean age 63.6±16.8 years) arriving in our Emergency Department (ED) of a 600-bed hospital university with signs and symptoms of hypertensive crisis. Past history was mainly hypertension (75%), diabetes (42.8%),
coronary artery disease (7.1%), chronic kidney failure (17.8%), cerebrovascular disease (3.5%) (Table). At home therapy was based mainly on: AT2 receptor antagonists (28.5%), calcium-antagonists (28.5%), beta-blockers (17.8%), diuretics (14.2%) (Table). In ED median [minimum-maximum] systolic blood pressure was 210 [155-280] mmHg, and diastolic blood pressure 110 [80-190] mmHg. Patients were subjected to the following diagnostic tests: ECG (96.6%), cerebral CT scan (50%), chest X-ray (46.4%), fundus oculi in 14.2%, and echocardiogram in 10.7% of cases.

**Results:** We have demonstrated: acute ischemic coronary disease (5/27 subjects), acute ischemic episode (3/14), only in one patient congestion signs typical of acute heart failure, pathologic retinal conditions (hemorrhage, exudates) in 3/4 patients.

**BNP** (median [minimum-maximum]) values were 25 [10-250] pg/ml, and NGAL were 60 [30-150] ng/ml. In ED therapy was performed, principally, with calcium-antagonists (24.1%), adrenergics (24.1%), vasodilators (20.6%), diuretics and AT2R antagonists (both 17.2%), beta-blockers (13.7%).

**Conclusions:** The group number is too small to have a diagnostic and prognostic validity for the complications of hypertensive crisis, yet. But, a larger number of patients will help to evaluate this topic.

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**Topic: SUBSTANCE ABUSE**

Short intensive observation role in diagnosis and treatment in chronic carbolithium overdose

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**Background:** Lithium is used widely in the treatment of manic-depressive psychosis. The relationship between serum lithium concentration and symptoms (often absolutely non-specific or possibly correlated to the first psychiatric diagnosis) depends on the type of poisoning. Chronic poisoning is relatively common because the therapeutic index of lithium is low: it is 0.6 –1.2 mEq/L, measured 12 h after the last lithium dose.

**Methods:** Pt1: DG, a 40 year old man, presented himself at our ED reporting mental confusion. He reported in anamnesis a Bipolar Mood Disorder, his therapy was carbolithium (overall dose of 900 mg). A complete blood analyses showed a carbolithium level of 1.83 mmol/L. Pt2: FR, a 80 year old woman, was referred by her daughter to our ED for a language slowdown. She reported in anamnesis a Bipolar Mood Disorder, his therapy was carbolithium (overall dose of 600 mg). A complete blood analyses showed carbolithium level of 1.83 mmol/L.

**Results:** Pt1: The patient was referred to our Short Intensive Observation, where intravenous therapy with 2500 ml of saline solution was administered. Nevertheless carbolithium concentration increased again (12 hours after ED access, 1.71 mmol/L); considering arrhythmia development risk the patient was referred to the Cardiology Unit.

Pt2: The patient was referred to our Short Intensive Observation, where intravenous therapy 2500 ml of saline solution was administered. A second blood analyses, performed to 16 hours from ED, showed a decrease in carbolithium concentration (1.25 mmol/L). The patient was discharged.

**Conclusions:** Until now, in the Emergency Department (ED) setting, a 12-h level is impractical, and serial lithium levels are used in an attempt to establish a trend in the serum lithium concentration. Recently, the activity of our ED has been enriched by the addition of an area of Short Intensive Observation, where patients are waiting for admission or discharge, if we can solve their problem in 24 hours. Right here such point to establish a trend in the serum lithium concentration. Recently, the activity of our ED has been enriched by the addition of an area of Short Intensive Observation, where patients are waiting for admission or discharge, if we can solve their problem in 24 hours.

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**Topic: EMERGENCY MEDICINE, FUTURE PERSPECTIVES AND TECHNOLOGICAL DEVELOPMENT**

Ethical dilemma in resuscitation

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**Background:** Emergency medical services (EMS) providers face many ethical issues while providing necessary care. Although provider judgment plays a large role in the resolution of conflicts at the scene. This presentation describes some of the common situations with ethical underpinnings encountered by EMS personnel and managers. The goals of CPR is to preserve life, Restore health, relieve suffering, limit disability, and reverse clinical death. CPR decisions are often made in seconds by rescuers who may not know the patient or know if an advance directive exists. As a result, administration of CPR may sometimes conflict with a patient’s desires of best interests.

**Methods:** A series of ethical questions are proposed, followed by a review of the literature and, when possible, recommendations for management.

**Results:** It is important to establish protocols and policies, when possible, to address these high-risk and complex situations.

**Conclusions:** This presentation provide guidelines to healthcare providers for making the difficult decision to provide or withhold emergency cardiovascular care.
**Topic: BIOMARKERS IN ACUTE DISEASES**

Research proposal: potential utility of galectin-3 and ST2 in detecting early myocardial structural and functional involvement in patients with type 2 diabetes and arterial hypertension

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**Background:** In several studies, galectin-3 levels strongly correlated with classical cardiovascular (CV) risk factors such as diabetes, insulin resistance, hypertension (HT), lipid disorders, obesity, kidney dysfunction and N-terminal fragment B-type natriuretic peptide (NT-proBNP). Also, it was demonstrated that patients with T2D exhibit higher sST2 levels compared to healthy controls and this correlation was linked to the glycemic control. Moreover, the presence of left ventricular diastolic dysfunction (LVDD) in these patients is associated with even higher sST2 levels.

The aim of our study is to determine the role of galectin-3 and ST2 in detecting early myocardial structural and functional involvement in patients with T2D and HT.

**Methods:** Study population should include 200 patients with T2D and/or HT. Patients with prior history or symptoms of ischemic heart disease, cerebrovascular or renal disease, microvascular diabetic complications and insulin therapy should be excluded. Study protocol would consist of demographic and clinical data, as well as biochemical measurements, anthropometric and echocardiographic evaluation. Biochemical measurements include routine laboratory tests, and specific biomarkers [galectin-3, ST 2, glycosylated hemoglobin (HbA1c), N-terminal fragment B-type natriuretic peptide (NT-proBNP)]. Cardiological evaluation includes physical examination, transthoracic tissue Doppler echocardiography and stress echocardiography. LVDD will be assessed using the criteria defined in a consensus statement on the diagnosis of HF with normal LVEF by the Heart Failure and Echocardiography Associations of the ESC. In order to exclude ischemic heart diseases, a stress echocardiography test should be performed in all patients.

**Results:** The results of our previous study with the similar protocol demonstrated significantly increased levels of galectin-3, blood glucose, and HbA1c in patients with T2D and HT. NT-pro BNP, creatinine and urea were also higher in these patients than in other two investigated groups. Echocardiographically, LV diameters and IVS thickness were increased in this group of patients. Furthermore, in the same cohort a positive correlation between galectin-3 and NT-pro BNP, and galectin-3 and LV mass were demonstrated. In addition, a negative correlation between galectin-3 and LV end-diastolic diameter was revealed.

**Conclusions:** This study revealed that levels of galectin-3 were higher in patients with both T2D and HT, and correlated with LV mass. However, further studies are needed to define precisely the clinical value of galectin-3 in detecting early myocardial dysfunction in this subset of patients.

### Table 1. Biochemical measurements

<table>
<thead>
<tr>
<th>Variables</th>
<th>GROUP 1</th>
<th>GROUP 2</th>
<th>GROUP 3</th>
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<tbody>
<tr>
<td></td>
<td>T2D</td>
<td>T2 + HT</td>
<td>HT</td>
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<tr>
<td>Glycaemia - mg/dL</td>
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<tr>
<td>HbA1c - %</td>
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<td>Total cholesterol - mg/dL</td>
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<td>HDL cholesterol - mg/dL</td>
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<tr>
<td>LDL cholesterol - mg/dL</td>
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<td>Triglycerides - mg/dL</td>
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<td>Urea - mg/dL</td>
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<tr>
<td>Creatinine - mg/dL</td>
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<tr>
<td>eGFR - mL/min</td>
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<tr>
<td>NT-ProBNP - pg/mL</td>
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<tr>
<td>Galectin 3 - ng/mL *</td>
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<td>ST 2</td>
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</tbody>
</table>

T2D — type 2 diabetes; HT — hypertension; HbA1c—glycated hemoglobin; HDL—high density lipoprotein; LDL—low density lipoprotein; eGFR—estimated glomerular filtration rate; NT-ProBNP—N-terminal fragment B-type natriuretic peptide.
**Echocardiographic characteristics of patients**

<table>
<thead>
<tr>
<th>Variables</th>
<th>GROUP 1 (T2D)</th>
<th>GROUP 2 (T2D + HT)</th>
<th>GROUP 3 (HT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LV end-diatolic dimension - mm</td>
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<tr>
<td>LV end-systolic dimension - mm</td>
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<tr>
<td>Stroke volume - ml</td>
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<tr>
<td>IVS thickness - mm</td>
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<tr>
<td>PW thickness - mm</td>
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<tr>
<td>LV ejection fraction - %</td>
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<tr>
<td>LAVI - ml/m²</td>
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<tr>
<td>LV mass/BSA - gr</td>
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<td>E/A</td>
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T2D – type 2 diabetes; HT - hypertension; LV - left ventricular; IVS - interventricular septum; PW - posterior wall; LAVI - left atrial volume index; BSA - body surface area; E/A - E/A', ratio of maximal early filling velocity and maximal late (atrial) filling velocity; E/E', early mitral valve flow velocity and early diastolic lengthening velocity ratio

**Topic: SUBSTANCE ABUSE**

**Acute intoxications by synthetic cannabinoids in the emergency system: the italian cases series**

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**Background:** Synthetic cannabinoids (SC) represents approximately 30% of new psychoactive substances (NPS) signaled in the last years. This study take into consideration the clinical manifestations of intoxicated patients by SC at Emergency Department (EDs) admission.

**Methods:** A prospective study (January 2010–December 2012) including cases evaluated by EDs network and followed by Pavia Poison Control Centre was performed. Symptomatic patients with referred/suspected abuse of SC and/or referred abuse of other substances psychoactive with an atypical clinical presentation were included. Demographic data, clinical course and laboratory results (biological sample/consumed substance) were collected.

**Results:** 40 patients (14-55 years) with acute SC intoxications were analyzed. Cases were registered on all national territory. SC were mainly assumed (90%) by smoking and product(s) have bought online in 45% of cases. Advanced laboratory investigations analysis (in order to detect the specific SC) were performed in 32/40 cases (80%). The clinical considerations and the correlation between clinical manifestations and specific SC were performed in the subgroup of patients (21/32) resulted positive for SCs in serum. Main clinical manifestations were: tachycardia >100 bpm (13/21; 62%), mydriasis (12/21; 57%), anxiousness/agitation (9/21; 43%), gastrointestinal symptoms (5/21;24%), hypertension (6/21;9%), hallucinations (3/21;14%); seizures were observed in 5% of cases. No lethal cases were
Clinical management of foodborne botulism poisoning in emergency setting: the Italian case series

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Background: Evaluate clinical presentation characteristics of foodborne botulism poisoned patients admitted in Emergency Departments (EDs) to obtain clinical data useful for emergency physicians to make clinical suspicion, diagnosis and early antidotal treatment.

Methods: A retrospective analysis of cases of foodborne botulism registered at Pavia Poison Control Centre was performed. Implicated food, clinical presentation, latency between symptoms-ED admission-treatment, clinical course, response to the antidotal administration and laboratory analysis data were analyzed.

Results: 98 cases were included. Eleven patients (11.3%) weren’t able to identify the suspected food. History was positive for consumption of vegetables (77%) and fish (16%) in water or oil, or meat conserve in 88.7%. In 81 cases (93.2%) causative food were home-made produced, in 4 cases were industrial and in 2 cases were ingested at restaurant. Most common symptoms reported at ED were dysphagia (55.1%) followed by ocular manifestations (ptosis, diplopia and mydriasis). In three cases dysphagia was the unique neurological manifestation of the poisoning. Twenty-six patients (26.5%) required mechanical ventilation. Antitoxin was administered in 59 patients (60.2%), with an average of 63 hours after symptoms onset. Twenty-six percent were treated within 24 hours clinical manifestations onset instead 53.8% of patients received a later treatment. Five adverse reactions were registered. Neurological permanent sequelae was registered in 1 case; 1 lethal case occurred.

Conclusions: Botulism is a rare disease in which early correct diagnosis is difficult and may require a toxicological consultation and represents a medical challenge for the emergency physicians (1, 2). Clinical presentation at EDs could be undefined, diagnostic procedures could be problematic and patients must be monitored because of dramatic respiratory failure. So, the PCC support is essential for the diagnosis and the management of poisoned patients (3, 4), specific laboratory tests, antidotic treatment), and in the identification and surveillance of possible outbreaks.


Topic: BIOMARKERS IN ACUTE DISEASES

Evaluation of the prognostic role of ST2: a new biomarker of cardiovascular disease

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Background: Chest pain is one of the most common reasons of patients’ admission to the emergency room. ACS is distinguished in ST-Elevation (STEMI) and Non ST-Elevation/ Unstable Angina (NSTEMI/UA). Around 2.5 million hospital admissions worldwide are due to NSTEMI/UA. NSTEMI accounts for 1.5 million admissions to hospital each year. It is estimated that two-thirds of acute coronary syndromes present as NSTEMI, and the remaining one third are attributable to STEMI.

Methods: Aim of this study was first of all to evaluate the diagnostic and prognostic role of the new biomarker ST2. Our aim was to discover a direct correlation between the biomarker level (admission in ED) and the mortality of patients with ACS. We also studied the diagnostic and the prognostic role of high sensitivity troponin (HSTn) and we compared it with the results of ST2. We enrolled 157 patients presenting to ED with chest pain. Patients were divided into three different groups: STEMI, NSTEMI and patient without acute coronary syndrome. We monitored these groups of patients with a new biomarker (ST2) and a phone follow-up 30 days after hospital discharge.
Results: Follow-up calls shown an interesting trend among the ACS groups of patients. ST2 was significantly higher in patients who died within 30 days than in patients who survived to STEMI (p<0.007). Even HSTn was significantly higher in deceased patients comparing to the survived ones, but with a less significant statistical difference (p<0.04). The same trend was found in the NSTEMI group: ST2 was higher in the deceased compared to the survived (p<0.03). After setting a cut-off of 35ng/mL we observed that 6 out of 9 patients with a final diagnosis of NSTEMI and ST2>35ng/mL died. Only 1 out of 7 patients with a final diagnosis of NSTEMI and ST2<35ng/mL died. The same trend was also found the STEMI group therefore showing that patients with a ST2>35ng/mL have a higher mortality: 10 out of 16 patients died.

Conclusions: ST2 has shown to be a good prognostic indicator in ACS patients. This was more important when compared to the prognostic values of other used indicators such as High Sensitivity Troponin I. At logistic regression, ST2 values showed to be a more significative risk factor than HSTn for death at 30 days. ST2 was more useful in evaluating the prognosis comparing to HSTn in both STEMI and NSTEMI patients.

Topic: RESEARCH IN EMERGENCY MEDICINE

Research proposal: use of anticholinergic medications in patients with cognitive impairment - the impact of hospital admission on anticholinergic burden

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Background: This is a research project that we have already started locally expanding from an already established cooperation through GREAT on patients with acute delir.

Many prescription and over the counter medications have anticholinergic activity. This includes drugs for hypertension, cardiovascular and pulmonary disease. Anticholinergic effects have been associated with worsening of cognitive function and have been implied in increased mortality. The use of multiple, even mildly anticholinergic drugs, is thought to have an additive effect causing an increasing anticholinergic burden.

Despite the well-established evidence clinicians have been slow to adapt and are not aware of the impact of many medications on cognition.

Methods: We are investigating the use of anticholinergic medications in patients admitted with a diagnosis of acute delirium or chronic cognitive impairment. We are recording the use of such medications that are known to have an effect on cognition, as described in the Anticholinergic Burden Scale (ACB) and of related drugs where there is published evidence of their anticholinergic activity which had not been included in the original research by Boustani MA et al.

As such we are monitoring the anticholinergic burden on admission and discharge and also if any further relevant medications have been used temporarily during the inpatient stay. We are recording demographic data, the length of stay in hospital, the concomitant use of cholinesterase inhibitors, whether there is a diagnosis of dementia (on admission or discharge) and/or acute delir (inclusion criteria), and also if the patients have died during admission. We will follow up on readmission within 30 days and mortality.

Results: Our hypothesis is that despite well-established evidence, clinicians do not reduce anticholinergic burden in patients with acute or chronic cognitive impairment. Descriptive statistics will be used for demographics. Statistical inference analysis will be conducted to investigate the anticholinergic burden before, during, and after admission, and the effect on readmission and mortality.

Conclusions: This is an easily performed research project. By involving other centers through the GREAT network, a larger number of data sets will allow the group to produce more meaningful results and also to investigate possible differences between health care services.

Topic: ACUTE DISEASES MANAGEMENT

Pnaemonia ab ingestis as fatal geriatric menercency

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Background: Geriatric emergencies are events whose frequency is increasing as the average life expectancy is rising. Often these events are fatal and require specific and highly-specialized treatments. Often geriatric emergencies are events complicating the most common geriatric syndromes, which, even if they are not classified per se as a diseases, predispose the elderly to an acute event. Among these serious complications the Pneumonia ab ingestis is a common occurrence.

Methods: We report the case of a 78-year-old man who was admitted in our geriatric ward for rehabilitation related to severe Hypokinetic syndrome due to a previous admission due to complications of untreated type II diabetes such as dehydration and electrolyte imbalance. The patient was suffering from cognitive decline Alzheimer disease-type. The patient had an important metabolic, renal, cardiovascular, neurological comorbidity. During hospitalization, he presented dysphagia.
Results: The patient showed signs of cough, phlegm and moderate fever. According to the examination and the chest x-ray, a diagnosis is made of Pneumonia ab ingestis. A nasogastric tube is placed, enteral hydration therapy is started as well as antibiotics therapy. Biological and biochemical parameters are monitored. The patient showed a raised temperature with increase of leucocytes, hypotension and clinical picture of shock and evolved towards the exitus.

Conclusions: The clinical case highlights the classic evolution of geriatric syndrome which in the elderly have a “cascade” evolution towards a more serious condition and finally death. Patients suffering from dementia usually have common complications caused by dementia, which is almost always deadly. To treat these patients a “geriatric knowledge” is necessary in order to prevent complications by knowing the geriatric syndromes. On the basis of these considerations it seems appropriate that The Society for Academic Emergency Room Medicine (SAEM) has commissioned a Geriatric Emergency Medicine Task Force to address the need for health professions training and care of the elderly. The American Geriatric Society, in collaboration with National Council of State EMS Training Coordinators, has developed a training program, Geriatric Education for Emergency Medical Services (GEMS). This is a continuing education curriculum for prehospital professionals focusing specifically on the care of geriatric patients.

**Topic: ACUTE DISEASES MANAGEMENT**

**Metabolic comorbidity as cause of inconsciuosness**

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**Background:** Comorbidity has been defined as the presence of two or more diseases in the same patient. The coexistence of different pathologies is a feature of the geriatric patient. Comorbidity, treatment with different drugs, difficulties in monitoring the correct assumptions of the therapy, altered metabolism make the geriatric patient particularly difficult to manage.

**Methods:** We report a case of a 84 hypertensive man with clinical history of diabetes mellitus II, dyslipidemia, chronic ischemic cardiopathy, chronic atrial fibrillation, tachy-brady syndrome treated with subsequent implantation of a monocameral pacemaker, chronic renal failure.

The patient was taking at home the following therapy: Warfarin, Bisoprolol, Ramipril, Furosemide, Simvastatin, Olanzapine, Metformin, Ethyl esters of polysaturated fatty acids, Alprazolam, Rivastagmine, Bromazepam, Spironolactone, Triazolam.

**Results:** When the patient was admitted in our geriatric ward he was somnolent, cachectic and dehydrated. Blood tests indicated acute renal failure (creatinine 2.17), severe electrolyte imbalance characterized by hypernatremia (Na 159), severe glycometabolic imbalance (glycaemia 420), severe bleeding diathesis (INR 4.67, 6.33, 10). Chest x-ray made us suspect an inflammatory outbreak in the right lung. We decided to interrupt the therapy he was following. We administered vitamin K in order to treat the bleeding diathesis and this led to the restoration of the parophysiological values (INR 1.2). Because of the suspect of a pulmonary infection, an antibiotic therapy was introduced. To restore the electrolyte and the glycometabolic balance, we started an hydration therapy, and an insulin therapy. A bladder catheter was inserted in order to control diuresis. Few days later, the patient appeared much less cachetic, acute kidney injury was getting better (creatinine 1.6), sodium values were in the physiological range (144), bleeding diathesis was under control (INR 1.2). Despite this improvement in the clinical conditions, we decided to transfer the patient in the emergency room, in order to better face the risk of sepsis.

**Conclusions:** The metabolic comorbidity seen in this patient was - beyond any reasonable doubt- iatrogenic. The case shows the importance of periodic checks and periodic adjustments in the therapy of geriatric patients with different diseases, as well as the risks that the patient face if a correct monitoring is not made, i.e. metabolic imbalances, which can create good conditions for the developing of infectious diseases, whose spread can lead to sepsis.

**Topic: NEUROLOGICAL AND PSYCHIATRIC DISORDERS**

**Gal-3 in Alzheimer’s patients with and without cormobidity**

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**Background:** Galectin-3 is a member of the lectin family and contains a carbohydrate-recognition-binding domain (CRD) of about 130 amino acids that enable the specific binding of BETA-galactosides. High levels of the protein have been found to be a biomarker for cancer and inflammation but especially for stroke and heart diseases involving myofibroblast proliferation, fibrogenesis, tissue repair, inflammation, and ventricular remodeling which cause heart failure. The discovery of a more recent role of Galectin-3 has been in cancer and apoptosis, and has been important in pursuing studies in a possible correlation between higher levels of Gal-3 in Alzheimer’s Disease (AD).
**Methods:** AD is a neurodegenerative disorder of the central nervous system which leads to dementia and eventually death, due to a variety of pathophysiological conditions. Levels of serum Galactin-3 are generally higher in AD patients compared to the control group. The difference between healthy subjects and diseased patients increases when the condition becomes more severe, while a smaller difference is seen among patients with a milder cognitive impairment.

We therefore put forward an observational project idea in which we follow patients affected by AD with and without heart failure. Galactin-3 levels will be measured in all patients in addition to other biomarkers associated with proliferation and heart failure. Moreover we will grow an Alzheimer cell line in cultures with and without Galactin-3 to assess the possible modulation of specific mRNA in the presence and absence of electromagnetic field stimuli.

**Results:** We look forward to assessing the results of the project and verify whether Galactin-3 is in fact significantly altered in patients with AD and therefore a useful biomarker for AD diagnosis in addition to other traditional tests. Furthermore we will also evaluate the results obtained by the cell cultures to verify whether Galactin-3 has a protective and immune function.

**Conclusions:** Gal-3 is also an important biomarker for assessment of the risk and progression of a wide array of illnesses and chronic diseases. In general patients who have been monitored and have been found with Gal-3 levels superior to the average population have a predisposition to developing a chronic disease.