RISK ANALYSIS FOR THE SURGICAL TREATMENT OF COLORECTAL CANCER IN ELDERLY PATIENTS UNDERGOING SCHEDULED AND URGENT INTERVENTIONS

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Due to recorded growth both in living standards and latest researches in medicine, proportion of people in old age has significantly improved all over the world. Although old age people are several percent of the entire society, number of surgeries within the group does not exceed 40%. Also risk of malignant neoplasms among old age people, significantly grows. Malignant neoplasm of colon appears to be most visible problem in group of people in age over 75 years old.

The aim of the study was a retrospective analysis of results in treatment of the sick over 75 years old, suffering from Malignant neoplasm of colon. Therapy was performed in the I Unit of General Surgery and Surgical Oncology in Provincial Hospital in Jelenia Góra.

Material and methods. Subject to analysis were 63 patients that went under operations in years from 2006 to 2010 due to the colorectal cancer, who have been divided now into two groups. First group included 49 patients treated as per schedule, and the second stood for 14, who required urgent treatment. Reference group has involved 20 younger patients, treated in urgent and scheduled courses, due to the colon cancer. There are no contradictions to emergencies and scheduled surgeries for patients in advanced years, suffering from colon cancer. Complications after colon cancer emergencies are far more frequent than in case of scheduled surgeries. Death rates among patients over 75 years old are far more frequent after emergencies than after scheduled surgeries. Concomitant diseases occur the same frequent during emergenices as during scheduled operations. During emergencies, it was left side of the colon that occurred to be infected with cancer more frequent.

Conclusions. There is no significant diversity in hospitalization time frames after emergencies and scheduled surgeries. Dangerous surgical complications within group of older patients, those after emergencies and scheduled surgeries too, are far more frequent in comparison to the reference group.

Key words: colorectal cancer, elderly, surgical treatment

The world’s population growth over the last century (especially in developed countries) has brought about changes in the structure of society. We are observing a transition from high to low birth and death rates, leading to an increase in the geriatric population worldwide. With an overall population of 38 million, there are approximately 5.1 million (13.4%) people above 65 years of age in Poland today. According to estimates for 2035, the overall population in Poland will drop to about 35.9 million, with the number of people above 65 years at about 8.36 million (23.2%) (1). There are similar predictions for Germany, where 80-year-olds are expected to constitute 11.3% of the population by 2050. People above 65 years of age already make up 20% of the population (2). Other studies predict 60-year-olds and
older people to constitute more than 50% of the German population in 2020, and about 70% in 2050 (3). In the USA, the number of centenarians rose from 37,000 in 1990 to 70,000 a decade later (4). This highly significant change in the structure of society calls for new solutions and treatment for elderly people to be applied in medicine and surgery in particular.

Operative treatment is becoming more and more common due to advancements in anaesthesiology and intensive therapy, with a significant increase in the number of operative interventions in elderly people (5, 6). Although elderly people make up less than 20% of the overall population, surgical interventions in this group account for 40% of the total number. Half of urgent surgeries and 75% of post-operative deaths occur in this age group. Colorectal diseases are among the most frequently found in surgical wards, especially in elderly patients. Colorectal cancer, the most common malignancy in people above 75 years of age, is perhaps the best example of those (7). Despite the use of modern surgical techniques and the development of anaesthesiology, the decision to proceed with operative treatment, bearing in mind what is known about concomitant diseases and possible complications but also the ultimate goal of improving the quality of life, remains highly challenging.

The aim of the study was a retrospective analysis of the outcomes of surgical treatment of patients above 75 years of age with colorectal cancer treated in the First Unit of General Surgery and Surgical Oncology of the Provincial Hospital in Jelenia Góra.

MATERIAL AND METHODS

Between 1st January 2006 and 31st December 2010, 2,744 patients above 75 years of age were treated in the 1st Department of General Surgery and Surgical Oncology of the Provincial Hospital in Jelenia Góra (formerly the First Unit of General and Paediatric Surgery and Surgical Oncology, Independent Public Health Care Facility of the Provincial Hospital in Jelenia Góra), accounting for 12.7% of all hospitalised patients (including children). Of those, 643 suffered from colorectal diseases and 95 were treated for colorectal cancer. This group of patients included 47 (51.6%) women and 45 (48.4%) men aged 75 to 93. Forty-nine patients including 26 (53%) women and 23 (47%) men presented for scheduled surgical treatment while 14 patients, 8 (57%) women and 6 (43%) men, required urgent surgical intervention. A detailed analysis of all patients’ medical documentation was performed to determine the course of admission to hospital, recommendations for operative treatment, patient condition according to ASA, type of interventions, concomitant diseases, post-operative complications and mortality. Additional data such as cancer location, hospitalisation period and type of hospital discharge were also determined. Statistical calculations were performed based on the analysis of a data set for 63 patients.

The study population comprised 14 patients undergoing urgent surgical treatment for colorectal cancer and 49 patients undergoing scheduled treatment for the same condition. Twenty younger patients undergoing scheduled or urgent treatment for colorectal cancer were randomly chosen as a reference group. This allowed for a multifactorial comparative analysis of the outcomes achieved for the study group and reference group. Statistical test results with a probability p<0.05 were considered statistically significant.

RESULTS

The study group included 34 (54%) women and 29 (46%) men aged 75 to 93, with an average age of 79.7. Forty-nine patients were admitted for scheduled surgery while 14 patients required urgent surgical intervention. A random group of 20 patients below 75 years of age suffering from colorectal cancer was chosen as a reference group. Patients admitted for scheduled surgery included 5 (50%) women and 5 (50%) men aged 35 to 59, with an average age of 50.6. Patients who required urgent surgical intervention included 6 (60%) women and 4 (40%) men aged 52-58, with an average age of 54.8.

Detailed results of the medical documentation analysed are shown in tab. 1.

DISCUSSION

The recent increase in life span has led to a significant increase in surgical care for geri-
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Table 1. The outcomes of surgical treatment in patients above 75 years of age with colorectal cancer and in a reference group of younger patients undergoing urgent and scheduled surgery

<table>
<thead>
<tr>
<th>Neoplasm location:</th>
<th>Group of patients above 75 years old</th>
<th>Both groups</th>
<th>Reference group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>urgent surgery 14 people</td>
<td>scheduled surgery 49 people</td>
<td>Both groups</td>
</tr>
<tr>
<td>rectum and sigmoid</td>
<td>3 (21.4%)</td>
<td>22 (44.9%)</td>
<td>25 (39.7%)</td>
</tr>
<tr>
<td>right half of colon</td>
<td>1 (7.1%)</td>
<td>17 (34.7%)</td>
<td>18 (28.6%)</td>
</tr>
<tr>
<td>transverse colon</td>
<td>2 (14.3%)</td>
<td>–</td>
<td>2 (3.2%)</td>
</tr>
<tr>
<td>left half of colon</td>
<td>8 (57.1%)</td>
<td>10 (20.4%)</td>
<td>18 (28.6%)</td>
</tr>
</tbody>
</table>

ASA classification
- ASA I – 6 (43%) 24 (49%) 30 (47.6%) 3 (30%) 4 (40%)
- ASA II – 4 (28.6%) 15 (30.6%) 19 (30.2%) 1 (10%) –
- ASA III – 5 (35.7%) 3 (6.1%) 8 (12.7%) 2 (20%) –
- ASA IV – 1 (7.1%) 9 (18.4%) 10 (15.9%) – 10 (10%)

Concomitant diseases:
- Hypertension – 6 (43%) 24 (49%) 30 (47.6%) 3 (30%) 4 (40%)
- Ischaemic heart disease – 4 (28.6%) 15 (30.6%) 19 (30.2%) 1 (10%) –
- Atrial fibrillation – 5 (35.7%) 3 (6.1%) 8 (12.7%) 2 (20%) –
- Type 2 diabetes – 1 (7.1%) 9 (18.4%) 10 (15.9%) – –
- Chronic obstructive pulmonary disease – 3 (21.4%) 5 (10%) 8 (12.7%) – –
- Bronchial asthma – 1 (7.1%) 3 (6.1%) 4 (6.35%) 1 (10%) –
- Hypothyroidism – 2 (4%) 2 (3.2%) – – –
- Hyperthyroidism – 2 (4%) 2 (3.2%) – – –
- Chronic renal disease – 2 (4%) 2 (3.2%) – – –
- Other neoplasm – 1 (7.1%) – 1 (1.6%) – –

Types of surgery:
- Resection surgery overall – – – 50 (79.4%) – –
- By-pass anastomosis – 1 (7.1%) 3 (6.1%) 4 (6.35%) 1 (10%) –
- Stoma creation – 4 (28.6%) 5 (10.2%) 9 (14.3%) 3 (30%) –
- Resection of ascending colon – – 1 (2%) 1 (1.6%) – –
- Right hemicolectomy – 1 (7.1%) 12 (24.5%) 13 (20.6%) 2 (20%) –
- Resection of transverse colon – 2 (14.3%) 1 (2%) 3 (4.8%) – –
- Left hemicolectomy – 3 (21.4%) 2 (4%) 5 (7.9%) 1 (10%) 1 (10%)
- Sigmoid resection – 2 (14.3%) 7 (14.3%) 9 (14.3%) 3 (30%) 4 (40%)
- Anterior resection – 1 (7.1%) 13 (30.6%) 16 (25.4%) – 2 (20%)
- Abdomino-perineal resection – 3 (6.1%) 3 (4.8%) – 3 (30%) –

Post-operative complications:
- Post-operative wound suppuration – 7 (50%) 15 (31%) 22 (35%) –
- Circulatory insufficiency – 1 (7%) 8 (16.3%) 9 (14.3%) 1 (10%) 2 (20%)
- Pneumonia – 4 (28.6%) 2 (4%) 4 (6.35%) 1 (10%) –
- Eventration – 1 (7%) 1 (2%) 3 (4.8%) – –
- Cerebral infarction – – 1 (2%) 1 (1.6%) –
- Urinary tract infection – – – 1 (1.6%) –
- Mesenteric obstruction – 1 (7%) 2 (4%) 1 (1.6%) –
- Bleeding from the wound – – – 2 (3%) –

Severe complications:
- 6 (85.7%) 4 (26.7%) 10 (15.9%) 1 (10%) 0

Packed red blood cells transfusions:
- Pre-operative – 1 (7%) 2 (4%) 3 (4.8%) – –
- Post-operative – 4 (28.6%) 17 (34.7%) 21 (33.3%) – –

Peri-operative mortality:
- 3 (21.4%) 1 (2%) 4 (6.35%) 1 (10%) 0

Average hospitalisation period:
- 22.9 days 20.5 days 21 days 20.2 days 14 days

ASA – American Society of Anesthesiologists

atri patients. The risk of malignancies increases with age. According to Landis et al., morbidity in the USA is about 200 cases per 100,000 individuals in populations below the age of 65. The risk is higher in older age groups, with morbidity reaching over 2,000/100,000 individuals (8, 9). Colorectal cancer is the most common malignancy in people above 75 years of age (7). In Great Britain, patients above 65 years of age account for 70% of colorectal cancer cases (10). In the years 2006-2010, 2,744 patients aged above 75 years...
of age were treated in the First Unit of General Surgery and Surgical Oncology of the Provincial Hospital in Jelenia Góra, accounting for 12.7% of all patients treated in that unit. Ninety-five patients, i.e. 3.5% of patients above 75 years of age were diagnosed with colorectal cancer. Studies by de Heer conducted between 1960 and 1973 concerning the treatment of geriatric patients have shown that these patients account for about 14% of all hospitalised patients (11). Markert and Januszewski compared the outcomes of surgical treatment in patients above 70 years of age and found a significant increase in the number of geriatric patients hospitalized over the course of about a decade. In 1990, these patients constituted about 4.8% of all patients treated at the surgical unit, while in 2001 – 11.8% (12). Our study material included 34 (54%) women and 29 (46%) men aged 75 to 93, with an average age of 79.7. Other analyses have also found that among geriatric patients operated for colorectal cancer, women constitute a larger group of patients compared with younger patients. This proportion varies between 35% and 62.5%, reaching 53.3% on average (12-18).

Among the 63 patients in our analysis, colorectal cancer was located in the rectum or rectum and sigmoid in 25 (39.7%) patients, in the right half of the colon in 18 (28.6%) patients, in the transverse colon in 2 (3.2%) patients, and in the left half of the colon in 18 (28.6%) patients. These results are not significantly different from data for younger populations and are consistent with the conclusions of other authors (19-23). Publications in recent years have shown that 19-55% of elderly patients have neoplasms in the right half of the colon, on average accounting for about 42.7% of studied cases (14, 15, 16, 18, 24, 25, 26). A comparison of younger and older patients operated for colorectal cancer showed that the neoplasm is located statistically more frequently in the right half of the colon in geriatric patients (18, 24). Analysis of the outcome of treatment in the 63 patients in our unit did not reflect this typical age-related neoplasm location. However, in the case of urgent interventions patients with cancer in the left half of the colon were operated on statistically more frequently. We found cancer of the rectum or rectum and sigmoid only in 3 (21.4%) patients, cancer of the cecum in 1 (7.1%) patient, cancer of the transverse colon in 2 (14.3%) patients, and cancer of the left half of the colon in 8 (57.1%) patients. Celban et al. provide similar data concerning the surgical treatment of neoplastic colon obstruction: the neoplasm was most frequently located in the left half of the colon (about 50%), followed by the right half of the colon and the rectum (13). The treatment of colorectal cancer may involve various surgical techniques, ranging from local excision to extensive procedures such as abdominoperineal resection. In our study material, resection surgery was performed in 79.4% of patients. This type of interventions were performed in the right half of the colon of 23.8% of patients, while the left side was operated in 52.4% of patients. Mrausch et al. showed a high resection rate of 92.7% for colorectal cancer in a study population of 2,932 patients above 80 years of age (18). Schuele et al. describe the resection rate at 84% for colon cancer and 92% for rectal cancer (10). The resection rate for colorectal cancer in geriatric patients described in other papers varies from 83% to 97% (14, 17, 20, 22, 24, 25). Although the resection rate in our material seems low, considerably lower values below 70% can be found in both Polish and foreign publications (21, 27).

Many studies have found higher resection rates in younger patients than in older patients (18, 21, 22). This is likely due to the fact that older patients present for treatment later, with significantly advanced cancer or when complications made hospitalisation necessary. In our material, a bypass anastomosis was created in 6% of patients and palliative surgery to create an artificial anus was performed in 14.3% of patients. Palliative resection is performed in 19-28% of treated patients (20, 25, 26). Primary anastomosis is performed in 76-86% of patients, while neoplasm resection with stoma creation is performed in 7-12.6% of patients receiving surgical treatment (14, 17, 24). Palliative treatment, such as stoma creation or bypass anastomosis is performed in 7-17% of patients (25, 28, 29).

Different studies have found 20 to 33% elderly colorectal cancer patients to require urgent surgery (12, 19, 21). In our setting, 22% of patients required such treatment. In the urgent surgery group, resection rate was considerably lower than in the scheduled surgery group and reached 64.2%. This is consistent
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with studies in patients with colonic obstruction receiving urgent surgery where resection was performed in 65% of patients. These were usually resection and anastomosis (13). In the study material, resection rate was also lower compared with urgent interventions in younger patients (21). For this type of interventions, our analysis found resection of the left half of the colon and palliative surgery to be performed statistically significantly more often. This is probably due to the patients’ general condition and the fact that the cancer was significantly advanced. Peri-operative risk is influenced by concomitant diseases, particularly common in geriatric patients, rather than age alone. Studies suggest that 60% of patients above 70 years of age suffer from at least one systemic disease (24).

In the >75 age group, 39% of patients have more than 5 concomitant diseases (30). In our study, 76.2% of patients had concomitant diseases. An equally large proportion of concomitant diseases in elderly patients has been reported by other authors, with the number of concomitant diseases increasing with age to exceed 80% (11, 12, 19, 21, 23). When we compared the number of concomitant diseases in the scheduled vs urgent surgery groups, only atrial fibrillation was shown to occur statistically significantly more often in the case of urgent surgery. According to the assessment of patients’ overall condition prior to surgery in our material, 15.9% of patients had ASA I classification, 50.8% of patients – ASA II, 31.7% – ASA III, while only 1.6% of patients – ASA IV. Marausch et al. reported similar results in the <80 age group. Among patients older than 80 years of age, 60% were given ASA III classification compared with 33% of younger patients. ASA I classification was given to 1.6% patients, ASA II – to 30% of patients (18). Ozoglu et al. have reported more severe conditions in patients pertaining to a similar age group to our material, where 7.2% of hospitalised patients were given ASA I status, 66.3% – ASA II status, 21.7% – ASA III status and 4.8% – ASA IV status. Khan et al. has similar findings, where ASA III – ASA V was observed in 53.6% of patients (22, 23). Among the 49 patients receiving scheduled surgery, the majority had ASA II status (55% of patients), followed by 20% of patients with ASA I status and 22% of patients with ASA III status. One patient received ASA IV status (2%). In the case of urgent surgery patients, the majority had ASA III status (64%) and 36% of patients had ASA II status. Scheduled surgery patients received statistically significantly better ASA classification (I-II). In our material, 35% of patients had post-operative complications and 6.35% of patients had more than one complication. Post-surgical wound infection was the most common complication and affected 14.3% of patients, followed by circulatory insufficiency in 6.35% of patients, pneumonia in 4.8% of patients and evertion in 3%. An analysis of treatment outcomes in patients older than 80 years of age by Marausch et al. found post-operative complications in 43.5% of patients. By comparison, complications affected 33.9% of younger patients (18). Other authors report complication rates of 21-54% (12, 21, 22, 23). In our material, post-operative complications were observed in 31% of patients receiving scheduled treatment. Post-operative wound infections were the most common complication affecting 16.3% of patients. Among patients receiving urgent surgery, 50% had complications. Wound suppuration was observed only in 7% of patients, while circulatory insufficiency – in 28.6% of patients.

Celban et al. reported circulatory/respiratory complications in 57% of patients receiving urgent surgery, post-operative wound infection in 36% and pneumonia in 14% (13). An equally high incidence of circulatory/respiratory complications following urgent surgery reaching 32% was reported in a Polish publication (21). Hoskins et al. found severe post-operative complications following urgent surgery in 20.7% of patients compared with 7.5% of patients receiving scheduled surgery (5). In our material, post-operative mortality was 6.35% which seems to be a very good outcome compared with other publications. Similar data can be found in papers by Khan and Mulcahy (23, 26). Kopć reports mortality at 17.5% of elderly patients and 4.9% of younger patients (21). Among patients receiving scheduled surgery in our analysis, peri-operative mortality was 2% compared with 21.4% among patients receiving urgent surgery. Hoskins et al. analysed a group of 795 patients above the age of 90 and found peri-operative mortality at 17.4% among patients undergoing urgent surgery and 6.8% among patients undergoing scheduled surgery (5). Post-operative mortality in
patients undergoing scheduled surgery varies from 2% to 25% depending on the author, while mortality following urgent treatment varies from 17% to over 40% (10, 12, 18, 23). The average hospitalisation period was 21 days for both groups but averaged 20.5 days for patients undergoing scheduled surgery and 22.9 days for patients receiving urgent treatment. Compared with other publications, the average hospitalisation period in our setting seems significantly long. Other authors have reported approximately 13 day periods (10, 11, 22).

CONCLUSIONS

It has been shown that there are no surgical contraindications for urgent and scheduled operations in elderly patients with colorectal cancer. Complications following urgent surgery for colorectal cancer occurred far more frequently than following scheduled surgery. In patients older than 75 years of age, postoperative mortality following urgent surgery was notably higher than in patients admitted for scheduled treatment. Concomitant diseases were observed with the same frequency in the urgent surgery group as in the scheduled surgery group. In the case of urgent interventions, cancer was found more frequently in the left side of the colon. Among patients above 75 years of age operated for colorectal cancer, there were slightly more women than men. No significant differences were shown in the hospitalisation period of elderly patients treated urgently vs as per schedule. Severe post-operative complications in elderly patients undergoing both urgent and scheduled treatment were observed with considerably higher frequency compared with the reference group.

REFERENCES


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