Case Report

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A rare cause of hyperamylasemia: multiple myeloma

Hiperamilazeminin Nadir Bir Nedeni: Multipl Myeloma

Abstract

Background: A higher amylase than normal concentration may reflect one of several medical conditions, including acute inflammation of the pancreas, perforated peptic ulcer, torsion of an ovarian cyst, strangulation ileus, mesenteric ischemia, macroamylasemia, renal failure and mumps. In addition; amylase production by epithelial carcinomas has been well documented. But hyperamylasemia associated with multiple myeloma has been reported only in a few cases. We report a case with hyperamylasemia associated with multiple myeloma in this paper because of rarity.

Case report: We report a 64 year old male patient with multiple myeloma. He had hyperamylasemia and no evidence of pancreatic and salivary gland disease, renal failure. The patient had relapse disease after autologous bone marrow transplant. Amylase value is high correlated with his disease status. Combined chemotherapy (lenalidomide 25 mg once daily orally on days 1–21 and dexamethosone 40 mg/day, days 1–4 of repeated 28-day cycles) was started to our patient for multiple myeloma. The amylase level decreased to a normal level after 28 days.

Conclusion: Paraneoplastic hyperamylasaemia as a marker to monitor disease progression and treatment response in cases with multiple myeloma. It related to extensive extra-medullary spread, extensive bone destruction and shorter survival time.

Keywords: Hyperamylasemia; paraneoplastic; multiple myeloma.

Introduction

Hyperamylasemia is a condition of elevated serum amylase activity. It is usually secondary to acute or chronic pancreatitis and pancreatic cancer. Hyperamylasemia resulting from the ectopic production of amylase by tumor tissue was first described in a patient with lung cancer [1]. Subsequently, several cases of amylase–producing epithelial and rarely nonepithelial tumors have been described [2, 3].
A few cases reported with multiple myeloma causing hyperamylasemia [4–8]. In a patient with multiple myeloma pancreatic diseases, renal failure, macroamylasemia and ectopic production by plasma cells may cause hyperamylasemia. We report a patient who presented with hyperamylasemia due to multiple myeloma at the relaps.

**Patients and methods**

A 64 year old male patient was admitted to our department with fatigue, fever, cough, dispnea. His past medical history included of immunoglobulin G-\(\lambda\) associated multiple myeloma for 2 years. He was treated with several cycles of chemotherapy followed by an autologous bone marrow transplant performed with a complete response. His disease relapsed after 6 months of autologous bone marrow transplant. Subsequently, lenalidomide treatment was applied. But this treatment was stopped reason of serious pneumonia.

On physical examination his blood pressure was 130/80 mmHg, pulse was 90 beats/min, no fever, pale skin and mucosa, bilateral basale crackles in lungs and without any other significant findings.

Laboratory findings were as follows; level of hemoglobin was 9.2 gr/dL, hematocrit 26.8%, white cell count 1800/mm\(^3\), platelets 13,000 \(\mu\)L, erythrocyte sedimentation rate 115 mm/h. Level of serum urea was 32 mg/dL, creatinine 1.6 mg/dL, sodium 131 mEq/L, potassium 4.3 mEq/L, uric acid 5.9 mg/dL, total protein 7.1 mg/dL, albumin 2.8 mg/dL, C-reactive protein 89 mg/L, aspartate amino transferase 27 UI/L, alanine amino transferase alkaline phosphatase 33 UI/L, gamma glutamyl transferase 68 UI/L, alkaline phosphatase 68 UI/L, lactate dehydrogenase 566 UI/L, IgG 16.1 g/L, IgA 0.231 g/L, IgM 0.17 g/L. M spike was determined in protein electrophoresis. Serum and urine immunoelectrophoresis showed the presence of a monoclonal band of IgG-\(\lambda\). Level of serum amylase at 481 U/L (normal range: 28–100 U/L). A bone marrow aspiration revealed a 20% infiltration by plasma cells and plasmoblasts. The abdominal ultrasound examination was grade 1 parenchymal degeneration disease of the both kidneys and without any other significant findings. Abdominal computerized axial tomography did not show findings of pancreatic disease. Amylasuria 2118 U/24 h (normal range: 0–1100 U/24 h).

**Results**

In our patient, diagnostic tests and the absence of clinical symptoms excluded inflammatory conditions or pancreatic disorders. The level of amylase increased progressively in our case. Combined chemotherapy (lenalidomide 25 mg once daily orally on days 1–21 and dexamethosone 40 mg/day days 1–4 of repeated 28-day cycles) was started to our patient for multiple myeloma. Amylase levels returned to normal after 28 days. The decrease in enzyme levels after the start of chemotherapy appeared to be closely related to the reduction in the level of serum IgG and M spike in protein electrophoresis.

**Discussion**

Hyperamylasemia was reported in same patient with multiple myeloma. Pancreatic disease, renal failure, macroamylasemia, and ectopic production by myeloma cells (paraneoplastic hyperamylasaemia) may cause hyperamylasemia. Paraneoplastic hyperamylasaemia in multiple myeloma was first described in 1988. Structural alterations involving chromosome 1 near the amylase locus were observed [9]. The amylase gene might be activated by an oncogene in patient with multiple myeloma. Thus, ectopic production of amylase in immunoglobulin-producing cells is considered a cause of hyperamylasemia associated with multiple myeloma. In our case, the absence of symptoms and clinical signs excluded acute pancreatitis. Moreover, none of the imaging studies (ultrasonography and CT) showed any evidence of pancreatic disease. In our patient, the elevated serum amylase activity and amylasuria suggested the diagnosis of ectopic amylase production.

Paraneoplastic hyperamylasaemia is more commonly associated with the IgA type, followed by IgG and it has only been described few patients with light chain myeloma [7, 8]. Our case has paraneoplastic hyperamylasaemia caused by immunoglobulin G-\(\lambda\) associated multiple myeloma.

Macroamylasemia is characterized by the presence amylase complexes attached to proteins. Amylase levels are lower than two times the normal limit. Diagnosis is established by determining the molecular weight of the serum amylase, with immunological techniques, and indirectly, by determining the fractional excretion of amylase in the urine. A value <1% is indicative macroamylasemia. Because amylase passes urine, but macroamylase cannot bypass urine. Macroamylasemia has been excluded in our case. Because, in this condition, urinary amylase excretion is low or absent, while in our case this was 2118U per 24 h.

Hyperamylasemia is a common finding in chronic renal failure (CRF) patients. The diagnosis of acute pancreatitis in these patients are confirmed when serum amylase value is
>3 times the upper normal limits. Chronic renal failure was present in our case. We have excluded hyperamylasemia associated with renal failure for amylase levels returned to normal. It has been seen in patients with hyperamylasemia the myeloma is more aggressive, high tumor mass, it has extensive extramedullary spread, extensive bone destruction, a poorer response to chemotherapy treatment and therefore short survival time, generally < 3 years. Therefore, in these patients, a simple test such as serum amylase may represent a disease activity index and provide an additional prognostic information. In our case, amylase first increased during the relapse. The amylase level was decreased to normal range level after chemotherapy in our case.

**Conclusion**

We suggest; common cause of hyperamylasemia should be investigated in patient with hyperamylasemia and multiple myeloma. After paraneoplastic hyperamylasemia should be considered if no a common cause of hyperamylasemia. The treatment of multiple myeloma should be started immediately. Because, the level of amylase returns to normal value after treatment of amylase-producing tumors. In addition; a simple test as serum amylase may be disease activity index in patients with amylase-producing myeloma. Further studies are required so as together more information.

**Conflict of interest statement:** Authors have no conflict of interest.

**References**