Hypercalcemia in Tumor Lysis Syndrome

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Abstract Tumor lysis syndrome (TLS) is characterized by hyperkalemia, hyperuricemia, hypocalcemia and hyperphosphatemia. This report describes a case of hypercalcemia in TLS in a patient with diffuse large B cell lymphoma.

Keywords Hypercalcemia · Tumor lysis syndrome · Lymphoma · Paraneoplastic syndrome

Introduction

Tumor lysis syndrome (TLS) is an important oncologic emergency associated with bulky and rapidly growing cancers. It is characterized by metabolic abnormalities that include hyperkalemia, hyperuricemia, hypocalcemia, and hyperphosphatemia. TLS can occur spontaneously or as a result of cytotoxic therapy. It is associated most often with Non Hodgkin's lymphoma and acute leukemias, although it is not uncommon in other malignancies [1]. We describe an unusual case of hypercalcemia in TLS associated with diffuse large B cell lymphoma (DLCL).

Case Report

A 77-year-old man was diagnosed with DLCL on diagnostic splenectomy. Patient was given four cycles of

chemotherapy with rituximab, cyclophosphamide, vincristine, doxorubicin and prednisone (RCHOP). Four months later, he presented to the clinic with upper abdominal pain of 2 weeks. He denied fever, night sweats, weight loss, nausea, vomiting or diarrhea. On physical examination, he had a palpable tender mass in the left upper quadrant extending to the epigastric region. Blood work showed blood urea nitrogen 34 mg/dl (normal 8–23 mg/dl), creatinine 1.6 mg/dl (normal 0.7–1.2 mg/dl), uric acid 11.5 mg/dl (normal 2.5–8 mg/dl), potassium 4.3 mmol/l (normal 3.3–5.1 mmol/l), sodium 138 mmol/l (normal 133–145 mmol/l), lactate dehydrogenase 604 u/l (normal 94–250 u/l), calcium 15.5 mg/dl (normal 8.6–10.4 mg/dl), phosphorus 4.2 mg/dl (normal 2.7–4.5 mg/dl) and albumin 4 gm/dl (normal 3.2–5.2 gm/dl). Complete blood count was normal. CT scan of the abdomen and pelvis showed a large, multilobular mass in left upper quadrant and extensive adenopathy involving hepatic, hilum, and retrocrural periaortic lymph nodes bilaterally. CT guided biopsy of the left upper quadrant mass showed diffuse large B cell lymphoma. The patient was admitted to the hospital and treated for TLS and hypercalcemia with intravenous fluids, rasburicase, allopurinol and pamidronate. Bone scan, intact PTH and TSH levels were normal. Calcitriol level was elevated at 136 pg/dl (normal 18–72 pg/dl). TLS improved in 3 days and serum calcium level normalized in 7 days. After metabolic abnormalities improved, he was treated with rituximab, ifosfamide, carboplatin and etoposide chemotherapy (RICE).

Discussion

Tumor lysis syndrome results when tumor cells release their contents into the blood after therapy or spontaneously.

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TLS is generally associated with hyperuricemia, hypocalcemia, hyperphosphatemia, and acute renal failure [2]. This may result in renal failure, cardiac arrhythmias, and death from multiorgan failure.

Hypocalcemia and hyperphosphatemia usually develop 24–48 h after treatment of chemotherapy. Hypocalcemia in TLS has been attributed to intracellular phosphate forming complexes with free calcium after it is released into the blood stream [3]. Hypocalcemia can cause muscle cramps, tetany and seizures. It may also cause QT prolongation and impairment of cardiac contractility. Our patient had the unusual presentation of hypercalcemia in the setting of TLS. Hypercalcemia is a paraneoplastic syndrome, and has been found in 15 % of DLCL cases [4]. High calcitriol level in lymphoma is often attributed to uncontrolled vitamin D 1- α -hydroxylase activity by the macrophages adjacent to tumor cells [5].

In conclusion, patients with non-Hodgkin's lymphoma may have hypercalcemia in TLS. Calcitriol level should be checked as part of the work up of hypercalcemia in these

patients. Presence of hypercalcemia should not misguide physicians from diagnosing TLS in an appropriate clinical setting.

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