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Case Report

Spontaneous Tumor Lysis Syndrome in a Patient with Untreated Metastatic Melanoma

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Abstract

Tumor lysis syndrome (TLS) is an emergent condition within the field of hematology and oncology. It is caused by the rapid breakdown of malignant cells, and it is most often seen in patients with hematologic malignancies shortly following initiation of cytotoxic chemotherapy. Key laboratory findings of TLS include hyperkalemia, hyperphosphatemia, hyperuricemia, and hypocalcemia. It is often associated with concurrent acute kidney injury that can be severe and require renal replacement therapy if not recognized early. Prompt treatment is therefore urgently warranted and includes aggressive intravenous hydration, electrolyte replacement, rasburicase, and dialysis with nephrology consultation if needed.

It is sometimes forgotten that even patients with solid tumor and/or untreated malignancies are at risk of TLS. Here, we present a case of severe tumor lysis syndrome in a patient with untreated, rapidly progressive metastatic melanoma. He ultimately developed sustained renal failure which did not recover, despite later electrolyte correction. Thus, we hope to encourage clinicians to maintain a high level of suspicion for TLS in all patients with known or suspected malignancy who present with electrolyte derangements and acute kidney injury. The Cairo-Bishop criteria, comprised of both laboratory and clinical parameters, provide a helpful guide for diagnosis. Prompt recognition and treatment of TLS can prevent severe complications and be life-saving.

Keywords: *Tumor Lysis Syndrome; Acute Kidney Injury; Melanoma; Oncologic Emergency*

Abbreviation

TLS: Tumor Lysis Syndrome

Introduction

TLS is an oncologic emergency that can be fatal if not promptly recognized and treated. It is caused by rapid catabolism of tumor cells leading to their contents entering the bloodstream, precipitating severe electrolyte disturbances including hyperkalemia, hyperphosphatemia, hyperuricemia, and hypocalcemia. TLS is mostly reported in patients with hematologic malignancies following initiation of cytotoxic chemotherapy [1] but can be seen in any patient with a high-tumor burden, whether or not they have received cancer treatment.

Case Presentation

A 65 year-old man was admitted overnight from the Emergency Department to the hospital with oliguric acute kidney injury and abdominal pain. Past medical history includes a recently diagnosed metastatic melanoma. He had a very large tumor burden throughout the liver and abdomen and had not yet undergone any treatment. Physical examination showed a slightly distended abdomen with mild generalized tenderness to deep palpation. Laboratory evaluation revealed a creatinine of 3.1, BUN 69, potassium 5.6, and calcium 8. He

had no prior history of kidney disease. Urinalysis with urine electrolytes was ordered, and IV hydration was started. However, he continued to be oliguric. Labs 12 hours later showed a creatinine of 3.7, phosphorous 6.5, and uric acid 14.1. Rasburicase was started and nephrology was consulted. Unfortunately, his urine output did not respond to diuresis and urgent hemodialysis was therefore begun. He was subsequently diagnosed with spontaneous tumor lysis syndrome secondary to widely metastatic melanoma. A week later, he continued to require dialysis support. Chemotherapeutic options were discussed with the patient and his family, but overall prognosis was extremely poor. In this context, he chose to prioritize quality of life and declined further dialysis or cancer-directed treatment. He expired in the hospital a few days later.

Discussion

TLS is an oncologic emergency frequently encountered in clinical practice [2]. It is most often seen with hematologic malignancies following cytotoxic chemotherapy initiation; however, more rarely it can be seen with solid tumors following chemotherapy [3,4], or even spontaneously as in this case. Amongst cases involving solid tumors, patients with germ cell, small cell, and breast tumors are most likely to be affected [4]. Thus, it should be suspected in patients with large tumor burden who develop acute renal failure. If TLS is not diagnosed within the first 12 - 24 hours, it may lead to permanent renal failure requiring dialysis or even death. TLS is caused by the rapid breakdown of tumor cells, triggering large amounts of intracellular contents – including nucleic acid, potassium, and cytokines – to be released into the bloodstream. This leads to profound electrolyte disturbances which can result in severe multi-organ dysfunction, arrhythmias, seizures, and even death.

The diagnosis of TLS should be made promptly, and the Cairo-Bishop laboratory and clinical criteria can be a very helpful guide. These include the presence of at least 2 relevant electrolyte disturbances (hyperuricemia, hyperkalemia, hyperphosphatemia, hypocalcemia) in addition to creatinine 1.5 times the upper limit of normal and/or arrhythmia/seizure/sudden death [5]. Effective management consists of intensive hydration, treating electrolyte abnormalities, the use of rasburicase and nephrology consultation [6].

Conclusion

The diagnosis of TLS should be considered early in a patient with known malignancy, acute kidney injury, and major electrolyte derangements, even in the absence of a previous cytotoxic chemotherapy. Key laboratory findings include hyperkalemia, hyperphosphatemia, hyperuricemia, and hypocalcemia. Clinical manifestations related to these derangements may include acute renal failure, arrhythmias, and seizures. This constellation of findings is summarized by the Cairo-Bishop combined laboratory and clinical criteria, which can be used as guide for diagnosis of TLS. Within the setting of aggressive malignancy, TLS can precipitate sustained renal failure and other life-threatening events, and therefore prompt recognition and urgent treatment are of utmost importance.

Conflict of Interest

None.

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