SOHO ANNUAL MEETING 2024

Masked Intruder: Rasburicase Unveiling Methemoglobinemia in Tumor Lysis Syndrome

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INTRODUCTION

Tumor lysis syndrome (TLS) is a critical oncologic emergency characterized by the rapid breakdown of cancer cells, leading to severe metabolic disturbances such as hyperuricemia, hyperkalemia, hyperphosphatemia, and hypocalcemia. The primary treatment for TLS is Rasburicase, a recombinant urate oxidase that effectively removes uric acid from the bloodstream. However, in patients with glucose 6-phosphate dehydrogenase (G6PD) deficiency, Rasburicase can cause a rare but serious adverse reaction known as methemoglobinemia.

AIM

To report a case of Rasburicase-induced methemoglobinemia in a patient with undiagnosed G6PD deficiency and to highlight the importance of early recognition and management of this adverse reaction in TLS treatment.

CASE PRESENTATION

A 59-year-old male presented with worsening right flank pain. Initial laboratory tests showed an elevated creatinine level of 1.5 mg/dL. Computed tomography revealed a large retroperitoneal mass measuring 17 x 16 x 9 cm, involving the right renal hilum and causing severe hydronephrosis, indicative of malignancy. Biopsy confirmed diffuse large B-cell lymphoma. The patient had an elevated uric acid level of 10.3 mg/dL, suggesting spontaneous TLS. Treatment with Rasburicase initially yielded positive results. However, shortly after treatment, the patient experienced cyanosis and hypoxia despite a normal partial pressure of oxygen on blood gas analysis. He also developed acute hemolytic anemia, with the lowest recorded hemoglobin level being 5.9 g/dL, an elevated lactate dehydrogenase (LDH) level of 1,796 U/L, an elevated indirect bilirubin level of 5.0 mg/dL, and low haptoglobin levels (<30 mg/dL).Further investigations revealed methemoglobinemia levels of 4.5% and a low G6PD level of 0.8 U/g, confirming the diagnosis. Supportive care, including oxygen supplementation and blood transfusions, was provided. Rasburicase was documented as an adverse reaction in the patient's medical record to prevent future episodes of methemoglobinemia.

CONCLUSIONS

Methemoglobinemia is a rare but potentially life-threatening disorder, occurring when hemoglobin is oxidized to a ferric state (Fe+++), impairing oxygen delivery to tissues. Rasburicase, used in treating TLS, can induce methemoglobinemia in patients with undiagnosed G6PD deficiency. The urgency of TLS treatment often delays G6PD deficiency testing. Therefore, vigilance for methemoglobinemia symptoms in Rasburicase-treated patients is crucial. This case underscores the necessity of early recognition and appropriate management of methemoglobinemia to prevent severe complications. It also highlights the importance of considering methemoglobinemia as a potential adverse reaction and the need for thorough patient history in acute care settings.

REFERENCES

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