An unusual presentation of encephalopathy due to tumor lysis syndrome in multiple myeloma - A case report

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How to cite the article: Dharmalingam R, Chran L, Shivkumar MN, Shanmugam K.
An unusual presentation of encephalopathy due to tumor lysis syndrome in multiple myeloma - A case report. Onco Critical Care 2024;2(2)30-32

Keywords: The tumor lysis syndrome (TLS), Reversible Posterior Leukoencephalopathy Syndrome (RPLS),

Introduction

Tumour lysis syndrome is very rare in multiple myeloma because of the low proliferation of the plasma cells. There have been reports of spontaneous tumour lysis and induced by drugs like thalidomide and bortezomib.[1] Undue morbidity and mortality could be avoided with early recognition. Encephalopathy as a presenting feature of tumor lysis syndrome is very rare. Here we describe a case of multiple myeloma on bortezomib, lenalidomide and dexamethasone, who developed tumour lysis syndrome complicated with encephalopathy.

Case Report

A 60 yr male with no known comorbidities presented with history of back pain following a trivial fall. Imaging revealed pathological fracture of D12 vertebra, for which he underwent ballon kyphoplasty with percutaneous transpedicular biopsy. His blood investigations revealed pancytopenia on further evaluation. Bone marrow aspiration was performed and it was suggestive of multiple myeloma. PET-CT done showed multiple expansile lytic lesions in skull, multiple vertebra, ribs, sternum, clavicle, scapula, pelvic bones and bilateral femur bones. He was started on Dexamethasone, Lenalidomide (Day1 to Day21) and Bortezomib (Day1, Day4, Day8, Day11). After 7 days (2 doses of Bortezomib, 4 days of dexamethasone, 3 days of lenalidomide), he presented with complaints of acute gastroenteritis and severe dehydration. Laboratory investigations revealed pancytopenia with altered renal and liver parameters. He was initially treated in intensive care with broad spectrum antibiotics, fluid resuscitation and other supportive measures. He was shifted to ward after stabilization. Blood and blood products were transfused accordingly. Clinical condition improved. After 7days of ward stay, he was shifted back to ICU in view of decreased responsiveness. He had stable vitals with moderate to severe dehydration. Upon investigation, blood urea 174 mg/dl, serum creatinine 3.6 mg/dl, serum uric acid 8.4mg/dl, serum sodium 142.8 mg/dl, serum potassium 3.8 mg/dl, serum calcium 7.4 mg/dl, and serum phosphorous of 4.7 mg/dl. According to the Cairo

and Bishop criteria 2, the patient satisfied clinical and laboratory criteria (more than 25% change from the baseline) of tumor lysis syndrome. As the renal functions further deteriorated, he underwent hemodialysis. Initially encephalopathy was attributed to uremia, but inspite of urea normalising after few cycles of hemodialysis, patient's sensorium continued to worsen. He was intubated and ventilated to avoid aspiration. EEG and CSF analysis were not contributory for identifying the cause for encephalopathy. MRI done revealed only age related atrophy and chronic small vessel ischemic changes, with no features of PRES (Posterior Reversible Encephalopathy Syndrome). Patient had hyperbilrubinemia with normal Serum ammonia levels. The patient was continued on hemodialysis and other supportive measures. His sensorium gradually improved and he started obeying commands. The patient was weaned and was successfully extubated. Liver and renal parameters improved and he was shifted to ward with hemodialysis support on alternate days.

Discussion

The tumor lysis syndrome(TLS) occurs as a result of rapid cellular death and release of the cellular contents into the bloodstream, either spontaneously or in response to therapy, leading to the classical laboratory findings of hyperuricemia, hyperkalemia, hyperphosphatemia and hypocalcemia. These electrolyte and metabolic disturbances can progress to impairment of end organ functions[2-3] TLS can be diagnosed on the basis of clinical or laboratory features as per the Cairo and Bishop classification.[4] It is a life threatening complication with high morbidity and mortality due to the metabolic manifestations as a result of tumour cell lysis. The clinical outcome is determined by acute kidney injury(AKI),which is the hallmark of TLS. TLS has a very rare occurrence in Multiple myeloma and is still uncommon (approximately 1.4%) in patients receiving bortezomib.[5-6] Identifying the risk factors by close laboratory and clinical monitoring can help to prevent the complication of TLS.

Neurological presentation of TLS is rare and can present as PRES or seizures. In a case report[7], a 13 year old boy with T-Lymphoblastic leukemia with Tumor lysis syndrome developed seizures. MRI revealed high-intensity lesions on the parietal and occipital part of the brain indicating PRES. In our case, patient had altered mentation and decreased responsiveness, no epileptiform activity in EEG and MRI findings were not contributing towards the possiblity of PRES. Encephalopathy as seen in our case is not documented in literature.

It was reported that a case of 8 year old boy with lymphoblastic leukemia receiving chemotherapy, presented with altered mentation and poor general condition.[8] Diagnostic workup revealed relapsed ALL with Tumor lysis syndrome and without acute kidney injury. EEG revealed generalized slowing with metabolic encephalopathy. CSF analysis, CT and MRI done were not significant. His blood investigations revealed hyperammonemia levels. It

was concluded as a case of transient hyperammonemic encephalopathy in a Child with Relapsed Acute Lymphoblastic Leukemia and Severe Tumor Lysis Syndrome. But in our case, EEG was not suggestive of metabolic encephalopathy and serum ammonia levels were within normal limits.

In yet another interesting case report,[9] a 6 year old boy with stage 3-B cell lymphoma developed tumor lysis syndrome following prednisolone administration. He developed visual disturbances and neurological examination revealed cortical blindness. MRI revealed hyperintense areas in bilateral parietal, occipital and frontal lobes, predominantly in the subcortical white matter and cortex, on T2-weighted and FLAIR images. Both cortical blindness and MRI findings were suggestive of Reversible Posterior Leukoencephalopathy Syndrome(RPLS) or PRES. But, in our case, the patient did not have any visual disturbances or MRI findings suggesting RPLS that could explain the encephalopathy.

Conclusion

From our case we conclude that: 1) Although rare, tumour lysis syndrome is a potentially severe complication in treatment of multiple myeloma particularly in those with high tumour burden receiving bortezomib, lenalidomide and dexamethasone. Patients should be monitored carefully for the potential to develop TLS and supportive therapy to be instituted promptly. 2) Encephalopathy associated with tumor lysis syndrome can occur even in the absence of PRES , Hyperammonemia and seizures.

Source of Funding

None.

Conflict of Interest

None.

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