T-Acute Lymphoblastic Leukemia in a Young Adult Complicated with Unusual Findings: An Interesting Case

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Abstract A young adult diagnosed as T-acute lymphoblastic leukemia presented with unusual complications during chemotherapy. He was diagnosed to have tubercular splenic abscess and had neurologic complaints like vincristine-induced peripheral neuropathy and focal neurologic deficit complicating the course of chemotherapy. Cases of hepatosplenic tuberculosis presenting as abscesses during prolonged neutropenia in patients with acute leukemia during or after chemotherapy are rare but reported. Vincristine induced neuropathy is reported to be higher in Indian children possibly due to co-existent malnutrition. The focal lesions in the brain were intriguing as regards to the symptomatology and exact etiology especially with the limitation of imaging in such patients. This case highlights the difficulty in the course of chemotherapy due to the rare complications encountered.

Keywords T-ALL · Tuberculosis · Peripheral neuropathy · Neurological complications

We present an interesting case of T-acute lymphoblastic leukemia (T-ALL) in a young adult where unusual

complications were encountered which led to diagnostic dilemma as well as difficulty in the course of induction chemotherapy.

Case Report

An 18 year old male patient presented to us with a history of fever, generalized weakness and easy fatigability for 2 months. Outside he had been diagnosed and had received treatment for Tuberculosis for 10 days prior to his admission. On examination, the patient had pallor and bilateral cervical lymphadenopathy. There was no hepatosplenomegaly or bleeding manifestations. Bone marrow done at admission showed replacement with blasts which showed negative MPO and NSE staining, granular positivity for PAS and few blasts (<3%) positive for SBB on cytochemistry. Immunophenotyping showed positive expression of CD 7 (80.1%), Cytoplasmic CD3 (53.7%), CD 33 (65.4%), CD117 (39%) and CD34 (39%), weak expression of CD5 (11%). CD2, CD10, CD13, CD19, CD79a, HLA-DR and anti-MPO expression were negative. Cytogenetics showed a normal male karyotype. With this he was diagnosed as a case of T-acute lymphoblastic leukemia (T-ALL) with co-expression of CD33 and CD117 and started on Induction chemotherapy with Augmented BFM protocol. Viral serology (HBsAg, anti-HCV and HIV1 and 2) was negative.

He was a slow early responder with day-7 marrow showing 90% blasts. During early induction, he started having persistent headache, pain in the left leg but with no loss of power and pain abdomen off and on. He started having spikes of fever from day-16 Induction for which IV antibiotics were added and subsequently upgraded. Repeated blood and urine cultures done at this time were sterile. Routine CSF examination and cytology did not show any

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Fig. 1 CECT abdomen showing splenomegaly with multiple hypodense lesions in spleen

abnormality. His headache and left-sided flank pain were persisting. USG abdomen and CECT chest and abdomen done at this time showed multiple hypoechoic lesions/hypodense lesions in spleen largest measuring 2.7×2.2 cm in diameter (Fig. 1) likely to be abscesses and left sided pleural effusion. He subsequently underwent ultrasound-guided FNAC of the splenic abscess which showed predominantly necrosis on microscopy. Stain for acid fast bacilli were negative. Aerobic, anaerobic and fungal cultures were negative. TB PCR of the aspirate from splenic abscess was positive.

Towards later part of induction, patient had one episode of generalized tonic clonic seizure (GTCS) and was started on phenytoin; The NCCT done showed a doubtful hypodensity in left occipital region. Routine chemistry showed mild electrolyte imbalance (hypokalemia and hypomagnesemia) which was corrected. However, patient subsequently developed multiple attacks of GTCS and sodium valproate was added. MRI of the brain showed three dural based rim enhancing lesions with parenchymal invasion and significant surrounding edema (Fig. 2). MRI of the spine did not show any abnormality. CSF cells, sugar and protein were normal. CSF was negative for cryptococcal antigen, AFB staining and TB PCR. ADA level was normal (4.5 IU/l).

Bone marrow done at the end of Induction showed remission and peripheral counts had recovered. But patient developed blurring of vision and subsequently left sided foot drop. Fundoscopy did not show any evidence of papilledema. The Nerve Conduction study showed axonal neuropathy in upper and lower limbs with non recordable common peroneal motor action potentials and sural sensory action potential in left lower limb. The CK level was normal (11 IU/l).

Fig. 2 MRI brain T1W with contrast axial image showing dural and ring shaped enhancement in left occipital region with surrounding parenchymal edema

So the patient was provisionally diagnosed as T-ALL with complications: (1) Tubercular Splenic abscess (2) Vincristine-induced peripheral neuropathy and (3) Focal lesions in brain? tubercular. His consolidation chemotherapy was started after a delay by 2 weeks omitting vincristine and 4 drug ATT was added. He was started on Inj Morphine and T. Gabapentin for neuropathic pain in the lower limbs and was given a prosthetic support for foot drop. Over the subsequent weeks of consolidation chemotherapy, patient showed improvement in general condition, appetite and pain relief. A repeat USG abdomen at discharge showed a significant decrease in the size and number of splenic lesions. A repeat CECT head showed partial resolution of the focal lesions.

Discussion

Cases of hepatosplenic tuberculosis presenting as abscesses during prolonged neutropenia in patients with acute leukemia during or after chemotherapy are rare but reported [1, 2]. In a previous study from our institute, a prevalence of 6.9% active tuberculosis in acute leukemia patients was observed [3]. Hence tuberculosis as a cause of splenic abscess should be kept in mind especially in countries where the disease is endemic.

A recent study [4] reports a higher incidence of vincristine induced neuropathy in Indian children postulating it to be probably due to coexistence of severe malnutrition in them. Vincristine associated neuropathy manifests as loss of deep tendon reflexes, neuritic pain, paresthesias, and wrist and foot drop and less frequently as transient cortical blindness, oculomotor nerve dysfunction, jaw pain, facial palsy, sensorineural hearing loss, and laryngeal nerve paresis [5].

Treatment with intravenous (IV) vincristine at doses above 5 mg leads to a dose-dependent neuropathy with sensory symptoms but higher cumulative doses at around 30–50 mg are needed for the development of motor symptoms. The standard maximum adult IV vincristine dose of 2 mg IV per dose given at weekly intervals as given in our patient rarely results in the development of peripheral neuropathy although it is reported in patients with preexisting hereditary neuropathy like Charcot-Marie tooth disease [6].

The focal lesions in the brain were intriguing as regards to the etiology and we entertained the differentials of them being tubercular or fungal granulomas or leukemic deposit or leukoencephalopathy secondary to intrathecal cytarabine and methotrexate. CT and MRI have special limitations in cancer patients. The frequent use of corticosteroids reduces contrast enhancement. Diffuse meningeal enhancement can be seen after breakdown of blood–brain barrier caused by neoplastic, chemical, or infectious meningitis or after repetitive seizures [7]. Ultimately, brain biopsy may be necessary to make the diagnosis and to offer prognostic information. Brain biopsy is indicated to clarify the etiology of a ring enhancing lesion when the etiology remains unclear after MRI, MRS, and CSF [8]. However, biopsy could not be done for our patient.

In conclusion, this case is being presented because of the rare complications occurring in the same patient during chemotherapy. His disease, focus of active infection and

general debility probably contributed to the neurological complications encountered.

References

1. Lee DG, Choi JH, Kim YJ, Lee S, Min CK, Kim DW, Lee JW, Min WS, Shin WS, Kim CC (2001) Hepatosplenic tuberculosis mimicking disseminated candidiasis in patients with acute leukemia. *Int J Hematol* 73(1):119–121
2. Zheng RQ, Kudo M, Ishikawa E, Zhou P (2004) Multiple tuberculous abscesses of the liver and the brain in a patient with acute leukemia. *J Gastroenterol* 39(5):497–499
3. Mishra P, Kumar R, Mahapatra M, Sharma S, Dixit A, Chatterjee T, Choudhry DR, Saxena R, Choudhry VP (2006) Tuberculosis in acute leukemia: a clinico-hematological profile. *Hematology* 11(5):335–340
4. Gomber S, Dewan P, Chhonker D (2010) Vincristine induced neurotoxicity in cancer patients. *Indian J Pediatr* 77(1):97–100
5. Quasthoff S, Hartung HP (2002) Chemotherapy-induced peripheral neuropathy. *J Neurol* 249(1):9–17
6. Cil T, Altintas A, Tamam Y, Battaloğlu E, Isikdogan A (2009) Low dose vincristine-induced severe polyneuropathy in a Hodgkin lymphoma patient: a case report (vincristine-induced severe polyneuropathy). *J Pediatr Hematol Oncol* 31(10):787–789
7. Quan D, Hackney DB, Pruitt AA, Lenkinski RE, Cecil KM (1999) Transient MRI enhancement in a patient with seizures and previously resected glioma: use of MRS. *Neurology* 53(1):211–213
8. Pruitt AA (2004) Central nervous system infections in cancer patients. *Semin Neurol* 24(4):435–452