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Blood 142 (2023) 5843–5844

The 65th ASH Annual Meeting Abstracts

ONLINE PUBLICATION ONLY

613.ACUTE MYELOID LEUKEMIAS: CLINICAL AND EPIDEMIOLOGICAL

Central Retinal Vein Occlusion (CRVO) in Acute Lymphoblastic Leukaemia (ALL) Adult Patient Treated with Peg Asparaginase

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ntroduction

Asparaginase, available as native asparaginase or polyethylene glycol (Peg-aspa), is an essential component of multi-agent treatment protocols for Acute Lymphoblastic Leukaemia (ALL). It works by deaminating L-asparagine, leading to apoptosis and cell cycle arrest in leukemic cells. However, peg-asp is associated with various toxicities, including thrombotic complications mainly cavernous sinuses thrombosis and venous thrombosis.

Methods and Results:

We report a 48-year-old Indian gentleman, known to be hypertensive, diagnosed to have Precursor T-Lymphoblastic leukaemia/ lymphoma (NOS), when he presented with bicytopenia and a mediastinal mass. He was treated as per ALL protocol for adult at National centre for cancer care and research (NCCCR)Doha, which is adopted from UKALL-14 protocol. He received induction treatment (1A& 1B) and has achieved a morphological remission. He received prophylactic anticoagulation with low molecular weight heparin (LMWH) which was stopped only in the cytopenic nadir. During the ascending phase of induction 1B, He presented with acute onset of floaters and blurred vision in the left eye. Urgent CT head scan revealed vitreous haemorrhage. Full blood count was normal except Platelets of $20*10^{9}$ul. Coagulation screen, fibrinogen level and anti-thrombin level was within normal limit. Ophthalmological evaluation revealed vitreous and retinal haemorrhages, indicating Central Retinal Vein Occlusion (CRV). MRI/MRV brain ruled out intracranial venous thrombosis. CSF analysis excluded CNS disease. He received supportive transfusion; however, he has progressed to permanent loss of vision in the left eye. Therapeutic anticoagulation is not indicated in his case.

Thrombotic events can occur during induction therapy for ALL mainly cavernous sinuses thrombosis and venous thrombosis, yet CRVO is an unusual site for thrombotic events and associated predominately with age-associated vasculopathies. In the reported case, several factors contribute to thrombosis, including acute leukaemia, prolonged hospitalization, age, presentation with a mediastinal mass, steroid use as well as Peg-aspa and the patient was managed with prophylactic anticoagulation while on therapy. Asparaginase induces a hypercoagulable state by decreasing antithrombin III, protein C, and protein S levels, leading to hypofibrinogenemia and augmenting the risk of thrombotic events. Thrombosis can negatively impact disease-free survival and long-term outcomes, resulting in complications such as therapy delays, post-thrombotic syndrome, and central nervous system-related issues (seizures, neurocognitive deficits, blindness). While these complications may lead to hesitancy or discontinuation of peg-asp use, early recognition and vigilant monitoring of antithrombin III and fibrinogen levels can help to guide management. In cases where the treatment course is complicated by thrombotic events, a high index of suspicion should arise considering strongly the causative agent to be Asparaginase. Thromboprophylaxis with low-molecular-weight heparin (LMWH) is widely accepted as supportive therapy in ALL management.

Conclusion:

ALL patients receiving Asparaginase therapy are at risk of developing thrombotic events. Early identification of symptoms and risk stratification are essential for improved disease outcomes. Awareness and understanding of peg-asp-induced thrombosis, including unusual site thrombosis can help guide treatment decisions and improve patient outcomes in ALL therapy.

Disclosures No relevant conflicts of interest to declare.

https://doi.org/10.1182/blood-2023-188841