Unveiling Pseudo-TMA: The Importance of Identifying Vitamin B12 Deficiency in Hemolytic Disorders

Eiraj Khan,MD1 , Kriti Dhamija,MD1 , Kalaivani Babu,MD1 , Srinishant Rajarajan,MD1 , Alexandra Johnston, MD1

1 Medicine Institute, Allegheny Health Network, Pittsburgh PA, USA

Introduction

Vitamin B12 deficiency can infrequently present as pseudo-thrombotic microangiopathy (pseudo-TMA), complicating the differentiation from thrombotic thrombocytopenic purpura (TTP). Both conditions may exhibit thrombocytopenia, anemia, and schistocytes on peripheral blood smears. The objective of this case report is to emphasize the importance of distinguishing TMA from pseudo-TMA to avoid unnecessary treatments such as plasmapheresis.

Case Presentation

A 71-year-old female with a history of Crohn's disease on Ustekinumab and status post partial small bowel resection, and vitamin B12 deficiency presented with bilateral lower and upper extremity paresthesia and fatigue for one week. The neurological examination was unremarkable except for a loss of light touch sensation in the fingertips and bilateral heels. Laboratory tests revealed pancytopenia, with a hemoglobin level of 6.4 g/dL (down from 11.5 g/dL four months prior), an MCV of 127 fL, a leukocyte count of 2.42 k/mcL, and a platelet count of 149 k/mcL(from 195 k/mcL 3 months prior). The hemoglobin level improved with blood transfusion. The reticulocyte count was low at 1.5%, and LDH was greater than 2500 U/L. Haptoglobin was undetectable. Peripheral blood smear showed schistocytes. Plasmic score was 5 (intermediate risk for TTP of 6%). Vitamin B12 levels were undetectable (<150 pg/mL. Magnesium was deficient at 1.0 and potassium at 2.8. The patient was found to have other deficiencies including undetectable Vitamin D, and selenium and thiamine deficiencies. She was treated with daily parenteral vitamin B12 injections and was safely discharged with improvement in her hematologic parameters.

Discussion

The differentiation between TTP and pseudo-TMA is critical, as they present with similar hematologic abnormalities but require vastly different treatments. Patients with pseudo-TMA typically present with higher median LDH levels, low or normal reticulocyte counts, and higher platelet counts compared to TTP. An inappropriately low reticulocyte count relative to the degree of hemolysis is a key feature for distinguishing pseudo-TMA from TTP. Identifying pseudo-TMA is essential to avoid misdiagnosis and unnecessary treatments, such as plasma exchange. Integration of the clinical context, physical exam and lab parameters prevented unnecessary treatment in this case. It is critical to involve a hematologist to ensure that a diagnosis of true TTP is not overlooked, as the result could be acutely life threatening.

Conclusion

A thorough evaluation of clinical and laboratory parameters, with consultation from an expert hematologist, is crucial in distinguishing pseudo-TMA from TTP. Recognizing pseudo-TMA due to vitamin B12 deficiency prevents costly management, ensuring appropriate and effective treatment for patients.