Dr. Lance D. Dworkin Department of Medicine Research Symposium

Pseudo-Thrombotic Microangiopathy by Vitamin B12 deficiency

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Introduction: Vitamin B12 is a water-soluble vitamin primarily obtained from dairy and animal products. It is essential for several key enzymatic processes in the body, including DNA production. Vitamin B12 deficiency can manifest as pseudo-thrombotic microangiopathy (PTMA), which is an unusual clinical presentation of B12 deficiency. PTMA mimics primary thrombotic microangiopathies (TMAs) such as TTP, DIC, and HUS, with features like thrombocytopenia, schistocytes, and hemolytic anemia. In contrast to the aggressive treatment required for primary TMAs, PTMA can be effectively treated with B12 supplementation.

Case Presentation: A 73-year-old Caucasian male with a history of gout, hypertension, and hyperlipidemia presented with new-onset shortness of breath, bilateral leg pain, dizziness, tinnitus, and peripheral neuropathy. Physical examination revealed bilateral lower extremity edema, scleral icterus, and jaundice. Laboratory findings indicated normal folate levels, decreased vitamin B12 levels, elevated homocysteine, and elevated markers of hemolysis, including LDH (3137 U/L) and reticulocyte index (2.3). A peripheral blood smear exhibited macrocytic normochromic anemia with schistocytes and hypersegmented neutrophils. The patient began intramuscular and sublingual vitamin B-12 therapy, and substantial improvement in blood counts and reduced hemolytic markers were observed during a one-week follow-up.

Conclusion: PTMA is a crucial consideration in the differential diagnosis of TMA. A review by Fahmawi et al. in 2019 documented 41 cases of PTMA since 1971, suggesting that this remains a rare and potentially underdiagnosed condition. In contrast to true TMA, PTMA shows an excellent response to B12 supplementation alone, setting the standard for treatment. Physicians must remain vigilant about PTMA to prevent misdiagnosis and mistreatment. In fact, a review by Tran et al. demonstrated several adverse outcomes associated with unnecessary plasmapheresis, including anaphylaxis, hemothorax, and cardiac arrest. Recognizing PTMA could spare patients from unnecessary and risky treatments that are, at best, inefficacious and, at worst, life-threatening, when a significantly more feasible approach is available.

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