Title: Severe B12 Deficiency Causing Hemolysis and Leukemoid Reaction - an Uncommon Presentation of a Common Condition

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Introduction: Vitamin B12 deficiency is a common cause of anemia and neurological symptoms in the general population. B12 is a water-soluble vitamin found primarily in animal products and serves as a cofactor for DNA synthesis. Deficiency typically results from inadequate dietary intake, malabsorption, or antibodies to intrinsic factor, which is required for B12 absorption in the terminal ileum. Here, we report a case of vitamin B12 deficiency resulting in severe and atypical hematologic manifestations.

Case: A 55-year-old male with a past medical history of type 2 diabetes, CKD stage 2, hypertension, gout, and liver fibrosis presented from a correctional facility after routine laboratory testing for dizziness and lightheadedness revealed a hemoglobin of 5.8 g/dL. He reported associated symptoms including dry cough, syncope with emesis, exertional chest pain, recent weight loss, leg swelling, and scant hemoptysis. Initial labs on presentation showed hemoglobin 3.4 g/dL, MCV 103.5 fL, WBC 3.4 × 10^3/µL, and platelets 64 × 10^3/µL; all cell lines had been normal on prior labs 10 months earlier. He received two units of packed red blood cells with appropriate response, followed by a third unit with continued improvement. He was also found to have a right lower extremity DVT. Further workup revealed LDH > 3600 U/L, total bilirubin 5.8 mg/dL, haptoglobin < 30 mg/dL, a negative direct antiglobulin test, reticulocyte proliferation index 0.1, and vitamin B12 < 68 pg/mL with positive anti–intrinsic factor antibodies. Peripheral blood flow cytometry identified a small CD34-positive blast population comprising approximately 0.6% of total cells, raising concern for an underlying myeloid neoplasm. Peripheral smear demonstrated atypical mononuclear cells suspicious for blasts (approximately 2% by manual differential). He was initiated on intramuscular B12, after which his blood counts began to recover. He was discharged back to his facility with continued IM B12 therapy.

Discussion: This case highlights the spectrum of clinical and laboratory abnormalities that can result from a severe, prolonged, untreated B12 deficiency. B12 deficiency is common, but severe pancytopenia with hemolysis and leukemoid reaction seemingly exclusively due to B12 deficiency secondary to pernicious anemia are not. While presentations like the one described in this case have been previously documented, these symptoms would still have most physicians exploring alternate diagnoses before attributing them to a simple vitamin deficiency. While an extensive workup may, indeed, be warranted in a case like this, it also illustrates the classic adage taught in medical schools nationwide: when you hear hoofbeats, think horses.