To B12, or Not to B12

Dane Mackey¹; Kim Fremin, MD²; Raisa Martinez, MD³; Patrick Johnson, MD⁴; Valeriy Kozmenko, MD⁴; Khawaja Jahangir, MD⁵; Seema Walvekar, MD⁶

¹MS4, Louisiana State University Health Sciences Center, New Orleans, LA; ²PGY2, Dept of Medicine, LSUHSC-NO; ³PGY1-Neurology, Dept of Medicine, LSUHSC-NO; ⁴PGY1, Dept of Medicine, LSUHSC-NO; ⁵Fellow, Dept of H/O, LSUHSC-NO; ⁶Chief Resident, Dept of Medicine, LSHSC-NO

Introduction

- An estimated 1.6-3.7% of patients’ automated complete blood counts (CBC’s) reveal macrocytosis (red blood cells larger than normal).¹
- Of those patients, only 40% are actually anemic, leading physicians to underestimate the significance of macrocytosis.²
- We present a case of B12 deficiency that challenged our present system’s reference range for mean corpuscular volume (MCV) of 80-100 femtoliters.
- Our case report demonstrates that precise diagnosis of the etiology of a patient’s B12 deficiency may be more involved than all physicians are aware.
- Full evaluation of a patient’s B12 deficiency can be both complicated and expensive.

Case Presentation

- A 45 year old African American woman with vitiligo and irritable bowel syndrome complained of a 3 month history of progressively worsening dyspnea on exertion, weakness, fatigue, nausea and emesis.
- Past surgical history was significant for bowel resection several years ago.
- Physical exam revealed large hypopigmmented patches along her arms, chest and face, mild scleral icterus, sublingual jaundice, and mild epigastirc tenderness. Neurologically, she had significant parasesthesias in the left lateral deltoid and hemenal regions with intact motor strength and reflexes.
- On laboratory examination, she had a hemoglobin of 6.9 gm/dL, hematocrit of 20.7%, platelets of 99,000/UL, mean corpuscular volume of 98 FL, reticulocyte count of 0.8%, LDH of 2730 U/L, haptoglobin of 7 mg/dL, and vitamin B12 level of <50 pg/mL.
- Peripheral smear showed hypersegmented neutrophils, ovalocytes, and spherocytes. An iron panel, Coombs test, serum electrophoresis, and folate level were all normal.
- Methylmalonic acid and Homocysteine levels were 1363nmol/L and 45nmol/L, respectively.

Hospital Course

- She received 2 units of PRBCs and responded appropriately.
- She was found to have an autoantibody to intrinsic factor which was most likely the cause of her pernicious anemia.
- Treatment with B12 injections produced a good bone marrow response.

Discussion

- The combination of a fairly normal MCV and findings of a high LDH, low haptoglobin, and mildly elevated bilirubin (suggestive of hemolytic anemia) made this case an interesting presentation of B12 deficiency. Intraduodenal erythrocyte destruction was likely the etiology of the hemolysis.
- Pernicious anemia is seen predominantly in African American women older than 35.
- Autoantibody to intrinsic factor seems to be the cause in >50% of patients and autoantibody to gastric parietal cells in atrophic gastritis in >70% of patients with pernicious anemia.
- Our patient’s age, ethnicity, history of vitiligo, bowel resection, and irritable bowel syndrome put her at a higher risk of dietary deficiency, autoimmun, and malabsorptive causes of Vitamin B12 deficiency.
- Patients with vitiligo are at increased risk for developing an autoimmune disorder, such as Addison’s disease, autoimmune thyroid disease, rheumatoid arthritis, systemic lupus, thyroid disease, and others.³

References

11. http://www.active-b12.com/content/vitamin-b12-absorption

11. http://www.active-b12.com/content/vitamin-b12-absorption