A rare case of severe anemia caused by Vitamin B 12 deficiency with non-immune intramedullary hemolysis

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Introduction

- Macrocytic anemia can be associated with chronic alcohol use, vitamin B12 and folic acid deficiency. However, it is very uncommon to see severe macrocytic anemia in developed world, especially in a young healthy adult.
- Vitamin B12 and folate deficiency are rarely reported to cause hemolytic anemia.
- We present an interesting case report of a young female with severe anemia from vitamin B12, folate deficiency and non-immune intramedullary hemolysis.

Clinical Course

- 40-year-old Caucasian female with no significant past medical history, who has not seen a doctor in the last 20 years presented to our emergency department complaining of worsening shortness of breath and bilateral lower limb swelling for the last 6 months prior to admission.
- Shortness of breath had been worsening in the last 2 months to a point that she could barely walk about 6 feet. Patient also reported non-bloody diarrhea for the last few weeks, reports looking pale by her coworkers.
- She is a nonsmoker, drinks about 2 drinks a day, no illicit drug use and works as a state trooper police officer.
- Physical exam showed stable vital signs with tachycardia of heart rates in 90s, bilateral scleral icterus and pallor and 2 + bilateral lower limb pitting edema.
- Blood work significant lab findings as shown below. Negative parvo virus IgM, Negative Celiac antibodies including tissue transglutamase and Immunoglobin IgA, Negative EBV, HIV, hepatitis A, B and C serologies, Beta2 glycoprotein antibody panel negative.
- Flow cytometry & Paroxysmal nocturnal hemoglobinuria of peripheral blood unremarkable and negative.
- Peripheral smear (fig 1&2) showed marked anisopoikliocytosis, macrocytosis, spherocytosis, microcytosis, nucleated RBCs, leukocytosis with no blasts or atypical cells, decreased platelet number and negative for blood parasites.

Labs

- Hemoglobin : 2.2 mg/dl
- Hematocrit: 6.9
- MCV: 153.3
- MCH: 48.9
- MHCH: 31.9
- Platelet count: 62
- Vitamin B 12: 159 pg/ml (reference 180-914 pg/ml)
- Serum folic acid: 2.9 ng/ml (reference >5.9 ng/ml)
- Transferrin: 164 mg/dl (reference 203-362 mg/dl)
- Serum Iron: 227 mcg/dl (50-212 mcg/dl)
- Iron saturation: 99% (reference 15-50%)
- TIBC: 229 (reference 284-527 ug/dl)
- Direct Coombs test & Cold agglutin screen: Negative
- Haptoglobin : <30 mg/dl (Reference 44-215 mg /dl)
- LDH: 1496 IU/L (140-271 IU/L)
- Reticulocyte index: 2.1
- Methyl Malonic acid 257 nmol/L (reference 87-318nmol/L)
- Homocystine 69.7 umol/L (reference 4.4-13.6 umol/L)
- Intrinsic factor blocking antibody: Positive

Imaging

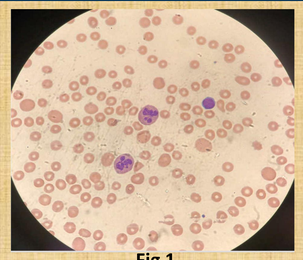

Fig 1

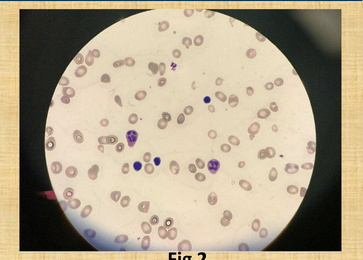

Fig 2

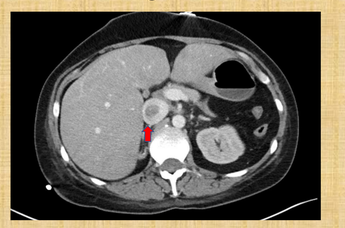

Fig 3

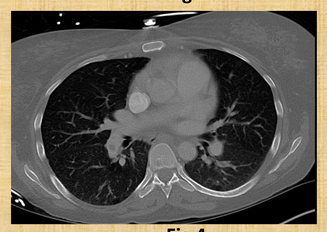

Fig 4

Fig 5

Clinical course cont.

- CT Chest, abdomen and pelvis with contrast showed bilateral lower limb deep vein thrombosis and pulmonary embolism (fig 3, 4 &5).
- Patient had an upper GI endoscopy which showed atrophy of 2nd portion of duodenum and unremarkable colonoscopy. Negative stool studies including C.diff, shigella, salmonella, vibrio, and E.coli. Ultrasound abdomen negative for hepatosplenomegaly.
- Patient received 5 units of packed red blood cells and 1 unit of FFP, IV folic acid and IM vitamin B12 injections.
- Hemoglobin improved and patient was discharged home on vitamin replacements and IVC filter in place.

Discussion

- Severe anemia from isolated folate and vitamin B 12 although uncommon in young healthy patients but should be considered in the differential diagnosis.
- Non-immune intramedullary hemolysis is a rare presentation of severe vitamin B 12 and folate deficiency likely due to abnormal erythropoiesis.
- Severe vitamin B 12 deficiency can mimic thrombotic microangiopathy and should be recognized prior to starting invasive measures such as plasmapheresis.
- Low vitamin B 12 level and an elevated homocysteine levels are associated with increased risk of thrombosis.

References

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