

Anemia Case for Resource Module

CASE 1

WM is a 71 year old African-American woman who presents to the outpatient clinic for a general medical check-up. She has been seen only once in the clinic previously about 3 years ago. She is a Jehovah's Witness, and her main complaint is that recently she has noted feeling tired and short of breath after walking several blocks doing her door-to-door ministry. She reports no chest pain, palpitations, cough, wheezing, or leg swelling.

Past medical history notable for osteoarthritis of the knees, GERD, Barrett's esophagus, glaucoma, and previous hemorrhoidal bleeding. She had a mild anemia at the time of her initial visit 3 years ago, with Hct= 32.9 and MCV=79. She was started on iron supplement but stopped taking it due to stomach upset. Her evaluation then for the anemia included a colonoscopy that showed diverticulosis and small internal hemorrhoids without bleeding. EGD showed Barrett's esophagus, no dysplasia.

Her only medication is Protonix 40 mg daily.

Social History: She is single with no children. Despite visual impairment from her glaucoma, she lives alone and is independent in her ADLs and IADLs except she doesn't drive.

On her physical exam, Wt=186 lbs, HR=88, RR=18, BP=132/72. O₂ sat on room air is 99% at rest and 97% with ambulation. Visual acuity is 20/100. Lungs are clear. Heart regular with a soft systolic murmur along the LSB. She has a genu valgus deformity of the right knee. The rest of her exam is unremarkable.

QUESTIONS

- 1) What is the differential diagnosis for her fatigue and shortness of breath?
- 2) What diagnostic tests would you order?

EKG is normal. Chest X-ray shows a large hiatal hernia, no pulmonary edema or infiltrates. Chemistries are normal. Blood tests show a Hgb=4.4, Hct=16.0, MCV=57.2, Ferritin<10, iron sat=2%.

Her fatigue and dyspnea are due to severe iron deficiency anemia.

QUESTION

- 1) What are your next diagnostic and therapeutic steps?

Because she is a Jehovah's Witness, she cannot receive blood products. She also has GI intolerance of oral iron. She is admitted to the hospital for infusion of intravenous iron. She receives 1750 mg of iron over 6 hours after a test dose, and tolerates it well. She is discharged to home the following day.

On follow-up blood work 5 weeks later her Hgb=10.2, Hct=32.3, MCV=88.5, Ferritin=99, and iron sat=42%. Her symptoms of fatigue and shortness of breath have resolved.

She is seen by the gastroenterologist for repeat endoscopic evaluation. Colonoscopy shows same findings as 3 years ago and no apparent source of bleeding. EGD shows 3 cm length of Barrett's esophagus and hiatal hernia with Cameron lesions, thought to be the source of her bleeding. She is continued on protonix and a low dose iron supplement is added.

CASE 2

JH is a 75 year old white male with CAD, A Fib, peripheral vascular disease, elevated cholesterol, and moderate dementia who resides at an assisted living facility. He returns for reevaluation of a pressure ulcer on his left heel. Four months ago he developed a blister on his left heel that eventually broke down creating a large ulcer. He has been receiving weekly evaluations and ongoing treatment in the Wound Clinic. There is no apparent infection but the wound has not shown much improvement. Bone scan is negative for osteomyelitis.

He complains of fatigue and has lost about 15 lbs in the past 2 months without a significant change in appetite. He reports some pain in the left heel.

His medications are Imdur 30 mg qd, Zocor 10 mg qd, Coumadin 5 mg qd, Trental 400 mg tid, Risperdal 0.5 mg hs, and Aricept 10 mg hs.

On exam, his Wt=139.3 lbs, Temp=98.2, HR=72, RR=18, BP=114/60. He is tired appearing and unshaven. Lungs are clear. Heart is irregularly irregular, without murmur. Abdomen is scaphoid, soft, and nontender. On his left heel there is a 5 cm Stage IV pressure ulcer with some granulation present, no signs of purulence or surrounding cellulitis. Pulses in the feet are nonpalpable.

You order blood work with this visit. Labs return with normal chemistries. Blood counts show Hgb=8.2, Hct=27.0, MCV=90.6 (Last CBC 4 months ago had Hgb=11.9 and Hct=36.4).

QUESTION

- 1) What additional diagnostic tests would you order to evaluate the anemia?

Additional tests are ordered: Reticulocyte count=1.5, Iron=38, TIBC=240, Iron sat=15.8%, Ferritin=160. Hemocults x 3 are negative.

QUESTIONS

- 1) How would you classify this patient's anemia?
- 2) What could be causing the anemia?
- 3) How would you treat the anemia?

Lab studies are consistent with the anemia of chronic disease.

The anemia is probably caused by the nonhealing pressure ulcer and associated inflammatory process. Occult malignancy is also in the differential.

Though the pt has CAD, he is not having symptoms and does not require transfusion at this time. The anemia is best addressed by identifying and treating the underlying cause(s). CXR and CT of abdomen and pelvis do not reveal any occult malignancy. The left heel ulcer does not appear to be healing secondary to arterial insufficiency. Arterial Doppler studies of the legs confirm severe PVD. JH is referred to vascular surgery and a left axillary to femoral bypass graft is performed. He had no postoperative complications. Two months after the surgery, the left heel ulcer is 50%

healed. JH feels better and has regained some weight. Repeat CBC now shows Hgb=12.4,
Hct=37.0.

CASE 3

CT is an 82 year old white woman with HTN, elevated cholesterol, lumbar spinal stenosis, osteoporosis with h/o L2 compression fracture, chronic renal insufficiency with Cr=2.3, hypothyroidism, and stress incontinence. She has had recent problems with hyperkalemia, necessitating discontinuation of Cozaar that she was taking for HTN. She complains of just not feeling good and low energy.

Her present meds are Norvasc 10 mg qd, Calcium 600 mg + Vit D bid, Fosamax 70 mg qweek, Synthroid .05 mg qd, Pravachol 20 mg qd, Tylenol 650 mg prn for pain.

Recent labs show a mild anemia with Hgb=11.0, Hct=32.3, MCV=92.8, Reticulocyte count=.87

QUESTIONS

- 1) Can this anemia be explained by normal aging?
- 2) What additional tests should be ordered to evaluate the anemia?

Normal aging does not cause anemia and it needs to be evaluated further.

Iron=78, TIBC=389, Iron sat=20%, Ferritin=84, Hemocults x 3 are negative, Vit B12 and Folate are normal. Erythropoietin=14 mU/ml (> 100 expected for degree of anemia).

QUESTIONS

- 1) What is the cause of CT's anemia?
- 2) Does it require treatment and how would you treat?
- 3) Who pays for the treatment?

The anemia is due to chronic renal insufficiency with decreased production of erythropoietin.

Her malaise and activity tolerance may improve with replacement therapy with erythropoietin. She is started on EpoGen 10,000 units SQ weekly administered by a nurse in your outpatient clinic. Medicare will pay for erythropoietin administered in the hospital or office, but will not pay for injections at home by the patient or a visiting nurse. Three months after initiating the EpoGen injections she reports improved activity tolerance and sense of well-being and labs show Hgb=12.9 and Hct=38.0.

CASE 4

IM is an 83 year old African-American woman who has been feeling poorly for the last 3 months. She lives independently in another state but came to stay with her daughter in this area 1 month ago. She complains of fatigue, decreased activity tolerance, has lost 25-30 lbs over the last 3 months, and has an unexplained anemia. She was hospitalized at another facility 3 weeks ago for anemia. She was transfused 2 units PRBCs and had a colonoscopy and polypectomy, but no bleeding source was found. She is now admitted to your medical service for further evaluation.

PMH: Type II diabetes mellitus for 9 years, hypertension, elevated cholesterol, mild memory loss, hiatal hernia repair on month ago, partial thyroidectomy for goiter 20 years ago.

Medications: Verapamil, Synthroid, Glyburide, and Potassium

Social History: Previously lived by herself. Independent in her ADLs and most IADLs; doesn't drive. She is a former substitute teacher and church secretary. She has 15 children.

Physical Exam: Wt=127 lbs, Pulse=78, Resp=14, BP=129/60. HEENT shows pale conjunctivae, nonicteric, oropharynx clear. Neck supple, no adenopathy. Lungs clear. Heart regular with 2/6 midsystolic murmur along the LSB. Breast exam without masses. Abdomen soft and nontender, no masses. Extremities without edema, inflamed joints, or skin ulcers. Neuro exam is nonfocal. Pelvic exam is normal.

Admission labs reveal normal chemistries and liver enzymes. BUN=22, Cr=1.2. Total protein=8.6, Albumin=2.2. Calcium=8.8. WBC=4.2, Hgb=7.0, Hct=23.0 with MCV=90, platelets=153. ESR=108. Hgb A1c=7.9. TSH=0.77.

QUESTIONS

- 1) What is your differential diagnosis for this patient's illness?
- 2) What other questions would you ask IM?
- 3) What additional diagnostic tests would you order at this time?

The patient's clinical presentation is concerning for some occult malignancy or chronic inflammatory process.

She has not had any fever, headache, or jaw claudication. She has some scattered aches and pains but no specific localizing shoulder or hip girdle pain. She denies cough, shortness of breath, chest pain, nausea, vomiting, abdominal pain, change in bowel habits, or blood in stool. She does have malaise and poor appetite.

Additional studies are ordered to evaluate the anemia and assess for occult malignancy. Folate=10.4, Vit B12=891, Ferritin=751, Iron=28, TIBC=181, Iron sat=15%. SPEP reveals a polyclonal hypergammaglobulinemia and moderate hypoalbuminemia suggesting severe chronic inflammation. C reactive protein=10.2 (normal 0-0.8).

Radiologic studies include a Chest X-ray read as clear, Chest CT shows patchy atelectasis. Abdomen/Pelvic CT reveals only diverticulosis without diverticulitis, no masses.

During this time in the hospital, IM has no fevers and her WBC remains low normal range with 40% polys, 42% lymphs, and 17% monos. She is transfused with her Hct rising to 29.

QUESTIONS

- 1) What kind of anemia does IM have?
- 2) Would you order any other diagnostic studies at this time?
- 3) Would you begin empiric treatment with prednisone for PMR?

She has an anemia of chronic disease, due to a chronic inflammatory process. The anemia is normocytic with a low iron saturation but a high ferritin.

IM does not have classic clinical symptoms of PMR but could have an atypical presentation. Prednisone is not yet started pending final results of investigations for other causes.

A transthoracic echocardiogram is performed which shows a mobile density on the aortic valve, possibly a vegetation. Two sets of blood cultures are ordered, and 12 hours later both sets are positive for gram positive cocci in chains suggesting streptococcus or enterococcus. She is started on IV vancomycin for endocarditis pending the formal culture and sensitivity results.