

Anemia in the Older Adults: Not Simply a Consequence of Aging

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Background

Anemia in the elderly is very common.

- The World Health Organization definition of anemia is hemoglobin <12 g/dL in women and <13 g/dL in men
- Prevalence estimates of anemia in older adults differ between community and institutional settings [1].
 - * In community-dwelling older adults, mean prevalence is 12% (3-25%).
 - * In the nursing home population, prevalence of anemia is much greater, ranging from 31-50%.
- A majority of cases in the community setting are mild (≥ 11 g/dL) while in the nursing home population, they are more severe [2].
- The most common cause of anemia in older adults is anemia of chronic disease, followed by iron deficiency anemia (IDA).
- Older adults are at high risk of IDA due to malnutrition, reduced iron absorption exacerbated by proton pump inhibitors, and gastrointestinal blood loss with increased incidence of GI cancer, angiodysplasia and antithrombotic use [7].

Anemia in older adults was once thought to have little clinical relevance or simply a marker of underlying chronic disease.

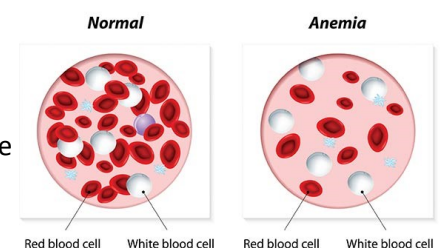
- Mild anemia is often detected incidentally, and patients are generally asymptomatic.
- Symptoms of anemia generally present only when the Hb is less than 9-10 g/dL and patients present with fatigue, dyspnea and tachycardia.
- Older adults, particularly those with cardiovascular disease, however, may have impaired compensatory mechanisms such as tachycardia.

Recent studies have demonstrated that adults with anemia, or even low-normal hemoglobin levels have increased mortality and morbidity.

- Older adults with mild anemia were at significantly higher risk of hospitalization and mortality than those without anemia[3].
- Anemia has been shown to be associated with increased risk of functional decline in older adults, including self-reported mobility limitations [4], decreased objective performance measures, increased falls and decreased muscle strength [5] and cognitive decline and dementia [6].

Anemia in older adults should be further evaluated and treated if possible.

- Causes of anemia can be categorized into 4 broad categories
 - * Nutritional deficiencies including iron, vitamin B12 and folic acid deficiencies
 - * Anemia of chronic disease including chronic kidney disease, congestive heart failure, hepatitis C, inflammatory and infectious diseases, and malignancy
 - * Occult gastrointestinal blood loss
 - * Myelodysplastic disorders (MDS) and malignant hematologic disorders



Evaluation

- Evaluate for underlying conditions such as gastrointestinal bleeding, malnutrition, chronic kidney disease, chronic inflammatory or infectious disease, chronic alcohol use, liver disease, and MDS.
- Laboratory testing should include a complete blood count with differential
- If anemia is confirmed, the mean corpuscular volume is used to classify anemia as microcytic, normocytic or macrocytic.
 - * Low or normal MCV, low ferritin and low serum iron indicates iron deficiency anemia
 - * Low or normal MCV, low iron level with high ferritin is suggestive of anemia of chronic disease
 - * Elevated MCV is suggestive of B12 or folate deficiency, hypothyroidism, chronic alcohol use, liver disease, MDS and malignancy. A peripheral blood smear and reticulocyte count should be performed.
 - * Elevated MCV with abnormal RBC shape suggests MDS when nutritional deficiency and drugs have been excluded. MDS state of bone marrow failure, and patients will have varying degrees of pancytopenia. Bone marrow examination is required for diagnosis.
- A corrected reticulocyte count is useful to determine bone marrow function. A low or normal corrected reticulocyte count in the presence of anemia indicates an inadequate bone marrow response.

Caveats to lab markers

- Anemia in older adults is often multifactorial, and MCV can have limited value.
- Microcytosis is reported to being present in <30% of older adults with IDA [8].
- Ferritin is also difficult to interpret in older adults since levels increase with age and with inflammatory comorbidities. However, ferritin levels less than 45 µg/L is highly suggestive of IDA

Management of Iron Deficiency Anemia

- Evaluate for occult GI blood loss.
 - * A fecal occult blood test should be performed.
 - * Patients should be referred for an upper and lower gastrointestinal endoscopy (taking into consideration prognosis and patient goals).
- Iron replacement can be diagnostic and therapeutic.
- Treat with oral iron replacement if there are no concerns for absorption.
 - * Standard treatment is 325 mg of ferrous sulfate three times per day to achieve 100-200 mg of elemental daily iron [9].
 - * Oral formulations of iron can be poorly tolerated.
 - * They can cause dark stools, abdominal discomfort, diarrhea, constipation and nausea, and vomiting.
- Lower doses of iron with less frequent dosing (as low as 15 mg of elemental iron daily) has been shown to be equally affective with reduced adverse effects [10].
- Hemoglobin normalizes typically after 8 weeks of treatment in most patients.
- Response to iron therapy can be affected by decreased absorption due to gastritis with hypochlorhydria, PPI use, and inflammation-associated increase in hepcidin (a key factor in iron homeostasis) [7].
- For those unable to tolerate oral formulations, concern for malabsorption, or no response to oral therapy, parenteral iron infusions can be administered.
- Continue to treat for 3-6 months once hemoglobin and serum ferritin levels have normalized [7].



Table 1 Overview of Anemia in Older Adults

Diagnosis	MCV <78 fl	MCV 78-100 fl	MCV >100 fl
Etiologies	Iron deficiency anemia Thalassemia Rare causes: chronic disease, sideroblastic anemia, lead intoxication	Acute inflammation (AI) Anemia of chronic disease (chronic inflammation, CKD) Severe renal failure GFR<30 ml/min Rare causes: drugs, aplastic anemia, leukemia	Folate deficiency Vitamin B12 deficiency MDS Hypothyroidism Liver disease, alcohol Rare causes: drugs, high reticulocytosis
Workup	Iron, transferrin, ferritin Complete GI investigation for IDA Hb electrophoresis for thalassemia	Workup and treatment of underlying disease in acute inflammation and anemia of chronic disease	Folate, B12 (homocysteine, methylmalonic acid) TSH, FT4 Liver enzymes, CT scan Review medications Consider bone marrow biopsy
Treatment	Treat causes of IDA and supplement with iron	Treat underlying disease for AI and ACD EPO for irreversibly renal failure Consider referral to specialist	Vitamin B12 and folate supplements Levothyroxine for hypothyroidism Referral to specialist

Adopted from Beyer et al., *Hematology*, 2010 [11]

The Bottom Line

- Anemia is not a normal finding in older adults. Mild anemia (<11 g/dL) or low-normal Hb levels should not be taken for granted in older adults even if they are asymptomatic.
- Evaluate patients for underlying causes of anemia including vitamin deficiencies, occult blood loss, chronic disease and malignancy.
- If determined that your patient has iron deficiency anemia, treating them with oral iron supplementation can be diagnostic and therapeutic. These patients should also undergo an endoscopy.
- If patients have macrocytic anemia or elevated ferritin levels, evaluate for B12 or folate deficiency, MDS and malignancy.

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