Iron Deficiency Anemia
Diagnosis and Management

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Key Points

• All patients (other than menstruating women) should have EGD and colonoscopy
• All patients should be screened for celiac disease
• All patients should receive appropriate iron therapy
• All patients not responding to therapy should be further investigated
Background
Iron Deficiency Anemia

- Most common nutritional deficiency world-wide
- 2-5% of adults have IDA in developed world
- 4-13% of referrals to GI are for IDA
- Menstrual blood loss most common cause for premenopausal women
- GI blood loss most common cause for men/postmenopausal women
Common Reasons for IDA

• Physiologic Conditions
  • Pregnancy
  • Lactation
  • Infants/Children/Adolescents
  • Menstrual losses (20-30%)
  • Inadequate dietary intake
Common Reasons for IDA

• Blood Loss
  • Blood sampling/Blood donations (5%)
  • Surgical loss
  • Excessive menstrual loss
  • Hematuria/Renal Cell Cancer (1%)
  • Epistaxis (<1%)

• Chronic Inflammatory States
  • Chronic renal disease
  • Congestive heart failure
  • Obesity
Common Reasons for IDA

• Medications
  • Aspirin/NSAIDs (10-15%)
  • Antacids
  • H2 Antagonist
  • Proton Pump Inhibitors
Common Reasons for IDA

- **Gastrointestinal Disease**
  - Peptic ulcers (5%)
  - Inflammatory bowel disease
  - Colon malignancy/polyps (5-10%)
  - Upper GI Cancer (<5%)
  - Esophagitis/Gastritis/Duodenitis
  - H. pylori infection (<5%)
  - Chronic atrophic gastritis
  - Celiac disease (<5%)
  - Malabsorption (gastric bypass, short gut) (<5%)
  - Angiodysplasia (5%)
Defining Iron Deficiency Anemia

Anemia
• WHO: Hgb < 13 in men, <12 in women
• Best to use lower limit of normal from lab

Iron Deficiency Anemia
• Iron deficiency is sufficiently severe to reduce erythropoiesis
Making the Correct Diagnosis
Diagnosing

• ‘gold standard’ – bone marrow iron aspirate
• CBC Indices
  • ↓ MCH (mean cell hemoglobin) - more sensitive than MCV
  • ↓ MCV (mean cell volume) - 40% of IDA have normal MCV
• Iron Indices
  • ↓ Ferritin
  • ↓ Serum iron
  • ↓ Transferrin saturation
  • ↑ TIBC (total iron binding capacity)
  • ↑ Serum Transferrin receptors
Ferritin

- Most useful test*
  - *in the absence of inflammation defined by normal CRP
- < 15 ng/ml
- When inflammation is present can be as high as 100 ng/ml
Serum Transferrin Receptor

- Elevated in IDA
  - Up-regulated on erythrocytes to absorb more iron
  - NOT affected by inflammation
Hepcidin: Newer diagnostic marker

- Regulates iron metabolism by INHIBITION of
  - intestinal iron absorption
  - reclamation by macrophages
  - mobilization from hepatic stores
- Production is DECREASED in IDA
- Production is INCREASED if iron overload or inflammation
- Clinical Use - help distinguish IDA v ACD
  - LOW hepcidin = iron deficiency
  - HIGH hepcidin = ACD
- Not commercially available yet in US
Who should be investigated?
IDA

• Any level of anemia in presence of iron deficiency should be investigated
• Men Hgb < 12, Women Hgb < 10 should be done urgently
  • Lower levels of anemia indicate more serious disease
Investigation

C'mon now Jim

It's time for your colonoscopy
IDA: History

- Iron-deficient diet?
- Aspirin/NSAIDs use?
- Family history of IDA (may indicate inherited iron malabsorption)?
- Blood donations?
- Recent surgeries or hospitalizations?
- Surgical history to GI tract?
- Any overt bleeding?
- Family history of colon cancer?
IDA: Exam

• Usually contributes little
• Abdominal mass
• Cutaneous signs of rare causes of GI blood loss
  • Peutz-Jeghers syndrome
  • Hereditary hemorrhagic telangiectasia
• Rectal exam/FOBT seldom helps (in absence of symptoms)
• Urinalysis
• Celiac screen (ttg/IgA)
IDA: Endoscopy

- EGD and Colonoscopy indicated
- If EBD/Colonoscopy is negative, further evaluation of SB is NOT necessary UNLESS inadequate response to iron therapy
- If H pylori detected, it should be eradicated
Importance of Colonoscopy

• Anemic patients with ferritin < 100 ng/ml are 5 times more likely to harbor advanced colonic neoplasia*
  • *colon cancer, malignant polyp or polyp with high grade dysplasia

Sawhney 2007
IDA: Small Bowel Evaluation

• Capsule endoscopy
  • Diagnostic yield of 40-55%
    • 50% have angioectasias, 6.6% have small bowel tumor
    • However it seldom results in beneficial subsequent intervention
• Enteroscopy (double balloon or push)
  • Mainly used to intervene on lesion found on capsule endoscopy
IDA: Imaging

• Small bowel imaging (MRI/CT enteroclysis or enterography)
  • Not as sensitive as capsule endoscopy
• Barium studies, Tagged RBC scans, Meckel’s scan - no clinical use
Treatment
Iron Therapy

• Oral Iron
  • Ferrous Sulfate
    • Tablets (200, 300, 325 mg)
    • Oral solution (220mg/5ml, 300mg/5ml)
    • BID or TID until stores replenished
  • Other products: HeMax, FeMax, ect.
  • Vitamin C 250-500 mg BID may enhance absorption
Iron Therapy

• Intravenous Iron
  • Iron sucrose (Venofer)
  • Ferric carboxymaltose (Ferinject, Injectafer)
  • Iron hydroxide dextran (Dexferrum, INFeD)

• Should only be used in patients intolerant or not responding to oral iron
Blood Transfusions

- Reserved for patients with cardiovascular instability or symptomatic anemia despite iron therapy
- Iron therapy should follow transfusions to replenish stores
Follow up

• After normalization of Hgb
• CBC (Hgb, MCH, MCV) Q3 months for 1 year, then Q6-12 months
• Restart iron therapy if anemia redevelops
• Further investigations are not necessary unless unresponsive to iron therapy or new symptoms develop
• Most patients will NOT have recurrent IDA in whom cause is NOT found with EGD, colonoscopy and negative celiac serology.
Special Considerations
Premenopausal Women

• 5-12% of healthy premenopausal women will have IDA
  • Menstrual blood loss
  • Iron deficient diet
  • Increased demands - pregnancy/breast feeding
• Malignant tumors are very uncommon
• 4% will have celiac disease
• Women over 50 y/o should have endoscopic evaluation, consider in women less than 50 y/o
• Test for H. pylori
Pregnant Women

• Mild IDA common - oral iron therapy
• Screen for celiac disease
• Endoscopy should be avoided
Patients with Significant Comorbidities

• Consider investigation on case-by-case basis
• Factors to consider
  • severity of anemia
  • risk of endoscopy (sedation, bowel perforation)
  • fitness to undergo treatment if malignancy identified
Post-Gastric Bypass/Gastrectomy

• IDA very common - poor chelation and absorption from loss of hydrochloric and ascorbic acid
• Investigate as previously described
• Oral iron therapy
Warfarin, Aspirin, Anti-platelets

• IDA should NOT be attributed to these drugs until GI investigation completed
Iron Deficiency without Anemia

- Hypoferritinemia in absence of anemia is more common than IDA
- No consensus on how patients should be investigated
- Screen for celiac disease
- If over 50 y/o, proceed with endoscopy
- Treat empirically with oral iron
Key Points

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• All patients should receive appropriate iron therapy
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Thank you for your attention