Blood Day for Primary Care

How do I Diagnose and Treat Iron Deficiency Anemia in the Adult?

Mark Kristjanson MD CCFP
Medical Lead, Primary Care Community Oncology Program
Disclosures

Faculty: Mark Kristjanson, MD, CCFP

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By the end of this session, the learner will be able to:

1. Discriminate iron deficiency anemia from other anemias on the basis of history, physical examination and lab parameters

2. Outline a practical approach to investigation of patients with iron deficiency anemia

3. Present a pragmatic strategy to treat iron deficiency anemia
Hb 124 g/L (down from a Hb of 148 last year)

1. What do you want to know or do?

• MCV 76 fl (mild microcytosis)

• Careful ROS

• PMHx & FHx

• Physical exam
CBC

- Hb 124 g/L (down from a Hb of 148 last year)
- MCV 76 fl (mild microcytosis)
- MCHC 288 g/L (mild hypochromia)
What would you do next?

A. Iron and TIBC
B. Hemoglobin electrophoresis
C. Reticulocyte count
D. Ferritin
E. B12
What if the ferritin is low?

- Semi-Urgent endoscopy consult
- Iron deficiency in the adult male or post-menopausal female = rule out GI pathology
Fecal Occult Blood?

- No role for a FOBT at this point (ie. if anemia or iron deficiency is present)

- This is no longer a ‘screening’ situation; you now suspect pathology

- Resist the temptation!!
Iron Deficiency Proven, & Work up initiated

- OK to start an iron supplement
- Consider ferrous sulphate 300 mg od, and increase gradually (to minimize GI intolerance) to 300 mg TID
Iron Deficiency & Normal Endoscopy?

In the context of this case:

- Gluten enteropathy / Celiac disease
- Neoplasms of the small intestine
- Angiodysplasia
Angiodysplasia
GIST (jejunum)
Pre-menopausal?

- Menstruation
- Pregnancy
- Delivery
- Lactation
Post-menopausal?

History of vaginal bleeding:
• endometrial biopsy;
• gynecologic ultrasound
Other Causes...

• Iron poor diet
Other Causes...

**Iatrogenic causes:**
- blood donation/blood letting
- Gastric by-pass surgery

**Intravascular hemolysis:**
- Cardiac valvular disease
- Paroxysmal nocturnal hemoglobinuria
Ferritin Normal?

- Iron deficiency not excluded
- Ferritin elevated by inflammation or liver disease
- Thalassemia? (microcytosis/anemia)
Ferritin Normal?

- Check serum iron and TIBC

- In iron deficiency
  - Iron low; TIBC elevated

- In anemia of inflammation
  - Iron low; TIBC N/low
  - Ferritin normal or elevated
An Algorithm for the Investigation of Anemia

START
Low Hb identified

WBC or Platelets abnormal?

yes
Complex disorder; possible marrow problem

(do both)

Blood smear

further investigations as appropriate

no

MCV

Microcytic

Normocytic

Macrocytic

Reticulocyte Count

Hypoproliferative

Hyperproliferative

Hemolytic

Key:

Tests
Diagnoses
Classifications

CAVEAT: anemia is often multifactorial; no algorithm can cover all possible situations or diagnoses

*Alteration in MCV is modest, and MCV is often within normal range

**Uncommon to cause more than mild anemia; test according to clinical context

Yellow area: consultation recommended

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Work-Up of IRON DEFICIENCY ANEMIA In ADULTS

INDICATIONS FOR GI ENDOSCOPY:  
- Adult males  
- Post-menopausal females  
- Unexplained weight loss  
- Family history of GI cancer  
- Any associated GI Symptoms such as: Dysphagia, Odynophagia, Dyspepsia, Abdominal pain, Melena, Hematochezia, Tenesmus, Altered bowel habit.

IRON REPLACEMENT:  
a) Control Blood Loss;  
b) Warn patients of GI side effects and start slow;  
c) Ferrous sulfate, gluconate, or fumarate or iron polysaccharide in doses that provide 150-200mg of elemental iron per day (e.g. ferrous sulfate 300mg TID)
How do I replace iron?

a) Address underlying cause

b) Start low; go slow. Minimize GI side effects.
   GI tolerability is related to amount of iron!!

c) Ferrous sulfate, gluconate, or fumarate or iron polysaccharide in doses that provide 150-200 mg of elemental iron per day (e.g. ferrous sulfate 300mg TID)
## Oral iron preparations (Replacement doses)

<table>
<thead>
<tr>
<th>Oral Iron Preparation</th>
<th>Elemental Iron Dose per Dose Formulation</th>
<th>Target Dose Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferrous gluconate</td>
<td>~35 mg/300 mg tab</td>
<td>6 tabs per day</td>
</tr>
<tr>
<td>Ferrous sulphate</td>
<td>~65 mg/300 mg tab</td>
<td>3 tabs per day</td>
</tr>
<tr>
<td>Iron Fumarate</td>
<td>~108 mg/300 mg tab</td>
<td>1-2 tabs per day</td>
</tr>
<tr>
<td>Ferrous sulphate elixer</td>
<td>44 mg/5 mL</td>
<td>15-20 mL</td>
</tr>
<tr>
<td>Polysaccharide iron complex (FeraMAX)</td>
<td>150 mg per capsule</td>
<td>1 capsule OD</td>
</tr>
<tr>
<td>heme-iron polypeptide (Proferrin)</td>
<td>11 mg per tab</td>
<td>1 tab TID</td>
</tr>
</tbody>
</table>

**Recommended first line:**

- Ferrous gluconate
- Ferrous sulphate
- Iron Fumarate

**Unproven claims of increased GI tolerability:**

- Ferrous sulphate elixer
- Polysaccharide iron complex (FeraMAX)
- heme-iron polypeptide (Proferrin)
Monitoring response to iron?

- Check retic count in a week to ensure marrow response
- Check CBC monthly until CBC is corrected
  - Hb should correct at about 10g/L per week
- Once CBC is corrected, check ferritin
- Continue iron replacement for 3 months after ferritin is within normal range, to replenish iron stores
Not responding to iron?

- Incorrect diagnosis (MDS, thalassemia, ACD/AI)
- Non compliance
- Non-absorption
  - Concomitant use of antacids
  - Celiac disease
- Blood/iron loss exceeds ingested iron
Take home messages

• Screening test for iron deficiency is serum ferritin

• Men and post-menopausal women require GI endoscopy if IDA is diagnosed without an obvious or cause (FOBT is not appropriate at this juncture)

• Start iron replacement low and titrate up to replacement doses. Iron sulphate is recommended as the first line oral iron preparation
When to consider a referral to hematology

- Hemolysis screen positive
- Hemoglobinopathy suspected
- Complex anemia; unable to determine iron status
- Inability to tolerate oral iron despite multiple attempts
Questions?

Mark Kristjanson
Mark.kristjanson@cancercare.mb.ca