Abnormal Hemoglobin – HM 6

DEFINITION

Anemia is a problem of not having enough healthy red cells or hemoglobin to carry oxygen to the body's tissues. Hemoglobin is two-way respiratory carrier transporting oxygen from lungs to the tissues and facilitates the return of carbon dioxide back to the lungs.

Normal hemoglobin results for adults vary but in general are:
*Female: 12.1 to 15.1 g/dL
*Male: 13.8 to 17.2 g/dL

Client with Hgb <12 may have a wide range of underlying causes from acute, life-threatening pathology to chronic diseases. Management depends upon correct diagnosis. Client with polycythemia Hgb >17 g/dl may be susceptible to early stroke.

SUBJECTIVE

May include:
1. Asymptomatic, particularly initially
2. Fatigue, weakness, paresthesia, listlessness, memory loss or concentration difficulties
3. Palpitations, dyspnea, headaches, angina pectoris
4. Weight loss, anorexia, bone and joint pain, restless legs, leg cramps, exercise intolerance
5. Unusual blood loss – report of hematemesis, melena, hematuria
6. Chronic blood loss (i.e., hemorrhoids, GI bleeding, intermenstrual or heavy menstrual bleeding, copper IUD use)
7. Inadequate nutrition or deficiency of folate, Vitamin B12 or Vitamin B6
8. Frequent pregnancies, short intervals between pregnancies
9. Excessive alcohol ingestion
10. History of drug ingestion (e.g., aspirin, NSAIDS, Dilantin, sulfa)
11. History of gastric or intestinal surgery
12. Personal or family history of anemia or hemolytic disorder
13. History of liver disease, gallstones before age 30, lupus erythematosus, rheumatoid arthritis, cancer and treatment, renal disease, hypothyroidism, hypopituitarism, intestinal absorption disorder (such as Crohn's or Celiac disease)
14. History of pica (clay, dirt, ice, paint)
15. Increased number of infections
16. History of regular/recent blood donation
17. In polycythemia: history of smoking, complaints of headaches, epistaxis, spontaneous bruising, burning pain in extremities, tinnitus, vertigo, plethora of face, hands and feet. The cause can be dehydration, bone marrow disease, birth defects, L sided heart failure, exposure to high altitudes, lung disorders, severe COPD, or pulmonary fibrosis
18. Athletes: Dilutional increased plasma volume, GI bleeding from high intensity exercise, intravascular hemolysis

OBJECTIVE

May include:
1. Pallor (conjunctivae, nail beds, mucous membranes), plethora of face, hands and feet
2. Nails (flattened, brittle or concave)
3. Jaundice
4. Heart murmur (systolic flow murmur)
5. Tachycardia, bounding pulse

6. Petechiae, purpura or ecchymosis
7. Heavy vaginal bleeding or cervical polyp
8. Hemorrhoids, melena, rectal carcinoma
9. Abdominal mass, hepatomegaly, splenomegaly
10. Paresthesias, numbness in hands and feet, unsteady gait and weakness of legs, bone tenderness
11. Glossitis (inflammation of the tongue) and cheilitis (inflammation of the lips), both seen in very severe anemia
12. Ethnic or racial origin may increase risk: Black or Mediterranean

LABORATORY

Should include:
1. Hgb venous or capillary
   a. Excessive squeezing with the finger stick method could alter capillary results. Consider recheck via venipuncture for enhanced accuracy

May include:
1. CBC
2. Serum Ferritin, iron, B12, folate, transferrin, reticulocytes count, TIBC
3. Peripheral smear
4. Pelvic ultrasound if heavy menstrual bleeding without identifiable cause

ASSESSMENT

Abnormal Hemoglobin

PLAN

Mild Anemia - Hgb 10.1 - 12.0 g/dl

If anemia is related to iron-deficiency:

1. Nutrition counseling on dietary iron (meat, beans, dark green leafy vegetables, prune juice, dried fruit and iron fortified breads and cereals).
2. If applicable, encourage the use of a combined contraceptives or progestin-only method such as progestin only pills, Depo Provera or hormonal IUC to decrease the number of days of bleeding and the amount of blood loss.
3. Recheck Hgb in one month, if no improvement, consider oral iron therapy. A therapeutic trial of oral iron therapy is justified for menstruating women with these hemoglobin levels. (Always keep in mind the multifactorial causes of anemia.)
4. Oral Iron therapy.
5. Begin ferrous iron replacement with a daily total of 150-200mg of elemental iron (or 2-3 mg/kg elemental iron in doses divided bid or tid). All should be given on an empty stomach with either juice or vitamin C supplement. Avoid dairy products, calcium supplements, caffeine products, high fiber foods, and antacids within 2 hours of administration. Simple ferrous salts absorbed most efficiently would include the use of one of the following:
   a. Ferrous gluconate –325mg (36mg elemental iron) one tablet PO TID
   b. Ferrous sulfate – 325mg (65mg elemental iron) one tablet PO TID (5mg ferrous sulfate = 1mg elemental iron)
6. Consider every-other-day dosing, 200mg elemental iron orally every other day, has been shown to increase absorption
7. Iron tablets taken at the same time of day
8. May affect the following medications: doxycycline, penicillin, ciprofloxacin, and drugs used for Parkinson's and seizures
9. RTC in one month for repeat Hgb. Expect increase in Hgb of 1 g/dl.
10. Continue iron therapy 4-6 months if Hgb is normalized.

11. Women with large menstrual blood losses may benefit with continued, intermittent therapy (one week per month) or one tablet a day for maintenance.

*If no improvement on iron therapy, see plan for severe anemia.

Severe Anemia - Hgb 10 g/dl or below

1. Consult / refer with physician. Follow-up may include:
   a. CBC with indices, differential count, reticulocyte count, peripheral blood smear, serum ferritin
   b. Sickle Cell test if applicable
   c. Test stool for occult blood
   d. GI procedures, such as endoscopy or colonoscopy with biopsies
2. Emergency referral for any of the following:
   a. Hgb 7 g/dl or less
   b. Active, uncontrollable bleeding
   c. Client acutely symptomatic
   d. Suspicions of ectopic pregnancy or internal hemorrhage

Polycythemia – Hgb 17 g/dl or above.

1. Refer to MD if Hgb 17 g/dl or above.

CLIENT EDUCATION

1. Discuss the underlying etiology of anemia or polycythemia and the importance of participation in the treatment plan and follow-up
2. Provide nutritional counseling
3. Discuss iron replacement medication including regimes, counsel about side-effects and strategies to improve tolerability.
   a. GI side effects are extremely common with oral iron. Side effects may include nausea, flatulence, constipation, diarrhea, epigastric distress, dark colored stool.
4. Recommend client RTC as appropriate per plan.

CONSULT / REFER TO PHYSICIAN

1. Any pathology found on exam which does not require immediate ER referral
2. Those not responding to a therapeutic trial of iron
3. Diagnositc procedural or imaging, as indicated
4. Any patient with severe or severely symptomatic anemia
5. IV iron infusion therapy, as indicated, when oral iron is intolerable, patient is non-responsive to oral treatment, poor adherence or side effect profile.

REFERENCES

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