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المحاضرة 16 – المرحلة الثانية الطب الباطني – تقنيات التخدير

Haematology

Anaemia

Around 30% of the total world population is anaemic and •
half of these, some 600 million people, have iron deficiency

Anaemia

This is defined as a reduction in the haemoglobin concentration of the blood. •

Although normal values can vary between laboratories, •
typical values would be less than **13.5 g/dL in adult males** •
and **less than 12.0 g/dL in adult females** . •

From the age of 2 years to puberty, less than 11.0 g/dL indicates •
anaemia.

As newborn infants have a high haemoglobin level, 14.0 g/dL is •
taken as the lower limit at birth

Clinical features of anaemia

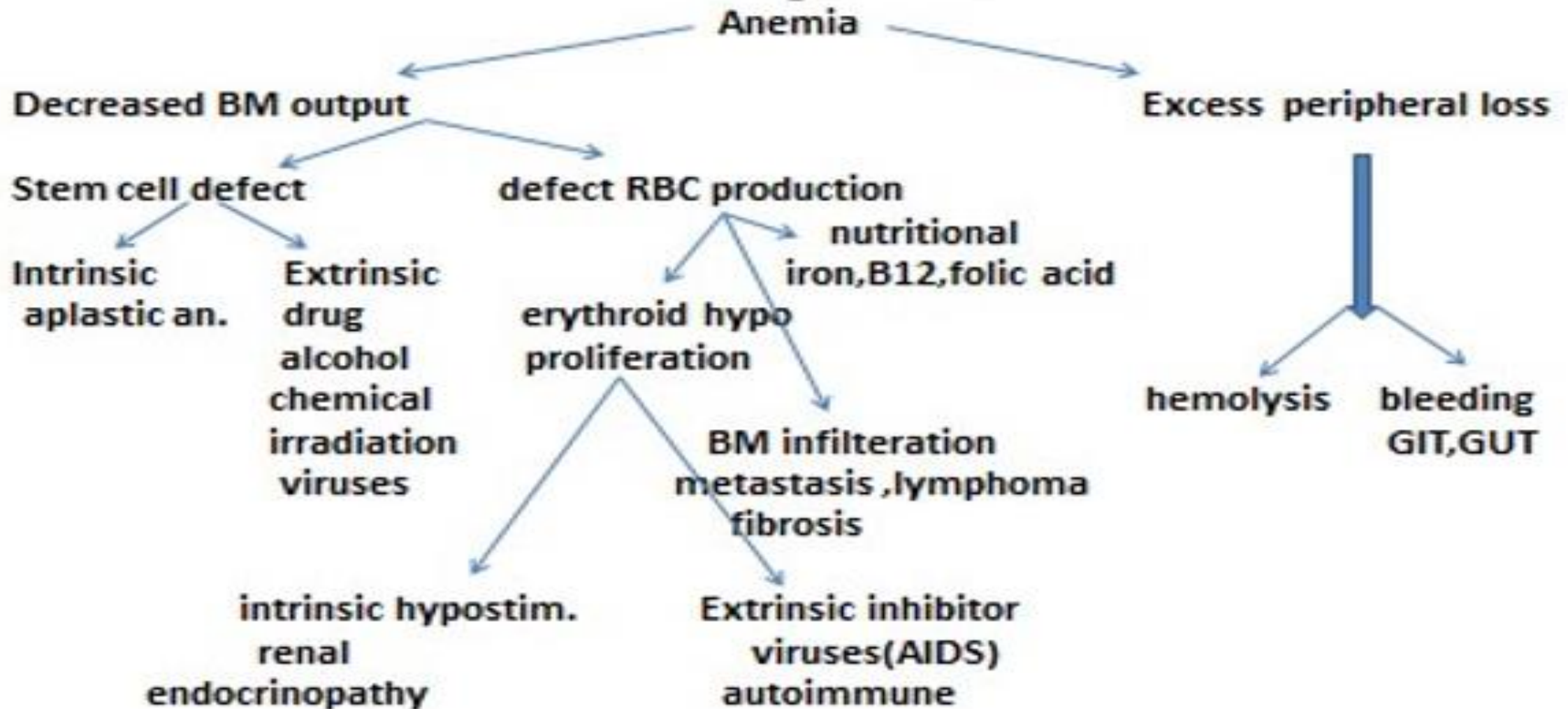
The presence or absence of clinical features can be considered under 3 major headings.

- 1- **Speed of onset** : Rapidly progressive anaemia causes more symptoms than anaemia of slow onset because there is less time for adaptation in the cardiovascular system and in the O₂ dissociation curve of haemoglobin,
- 2- **Severity**: Mild anaemia often produces no symptoms or signs but these are usually present when the haemoglobin is less than 9-10 g/dL.
- 3- **Age**: The elderly tolerate anaemia less well than the young because of the effect of lack of oxygen on organs when normal cardiovascular compensation (increased cardiac output caused by increased stroke volume and tachycardia) is impaired.

Signs and Symptoms of anemia :

- @ Shortness of breath particularly on' exercise, weakness, lethargy, • palpitation and headaches.
- @ In older subjects, symptoms of cardiac failure, angina pectoris or • intermittent claudication or confusion may be present.
- @ Visual disturbances because of retinal haemorrhages may complicate • very severe anaemia, particularly of rapid onset .
- @ General signs include pallor of mucous membranes which occurs if the • haemoglobin level is less than 9-10 g/dL.
- @ A hyperdynamic circulation may be present with tachycardia, a bounding • pulse, cardiomegaly and a systolic flow murmur especially at the apex. Particularly in the elderly, features of congestive heart failure may be present

Causes of anemia



Laboratory evaluation

1.CBC

2.iron study

3.bone marrow exam

4 other INVESTIGATIONS accordingly as Hb variant

G6pd,B12,RBC folate,osmotic fragility test,Ham ,Coombs test test,OGD,colonoscopy, etc

Iron Deficiency Anemia:

❖ Pathogenesis of Iron Deficiency Anemia

Three pathogenic factors are implicated in the anemia of iron deficiency.

- A. First, hemoglobin synthesis is impaired as a consequence of reduced iron supply.
- B. Second, there is a generalized defect in cellular proliferation.
- C. Third, survival of erythroid precursors and erythrocytes is reduced , particularly when the anemia is severe.

This occurs when iron losses or physiological requirements exceed absorption

Table 3.4 Causes of iron deficiency.

Chronic blood loss

Uterine

Gastrointestinal, e.g. peptic ulcer, oesophageal varices, aspirin (or other non-steroidal anti-inflammatory drugs) ingestion, partial gastrectomy, carcinoma of the stomach, caecum, colon or rectum, hookworm, angiodysplasia, colitis, piles, diverticulosis

Rarely, haematuria, haemoglobinuria, pulmonary haemosiderosis, self-inflicted blood loss

Increased demands

Prematurity

Growth

Pregnancy

Erythropoietin therapy

Malabsorption

Gluten-induced enteropathy, gastrectomy, autoimmune gastritis

Poor diet

A major factor in many developing countries but rarely the sole cause in developed countries

Intestinal malabsorption of iron is quite an uncommon cause of iron deficiency except after gastrointestinal surgery and in malabsorption syndrome •

Iron deficiency anemia may occur in paroxysmal nocturnal hemoglobinuria and intravascular hemolysis .

Clinical assessment

- Iron deficiency anaemia is the most common type of anaemia worldwide.

A thorough gastrointestinal history is important, looking in particular for symptoms of blood loss.

Menorrhagia is a common cause of anaemia in pre-menopausal females, so women should always be asked about their periods.

- A dietary history should assess the intake of iron and folate, which may become deficient in comparison to needs (e.g. in pregnancy or during periods of rapid growth;

- Past medical history may reveal a disease that is known to be associated with anaemia, such as rheumatoid arthritis (anaemia of chronic disease), or previous surgery (e.g. resection of the stomach or small bowel, which may lead to malabsorption of iron and/or vitamin B12).
- Family history and ethnic background may raise suspicion of haemolytic anaemias, such as the haemoglobinopathies and hereditary spherocytosis. Pernicious anaemia may also run in families but is not associated with a clear Mendelian pattern of inheritance

- A drug history may reveal the ingestion of drugs that cause blood loss (e.g. aspirin and anti-inflammatory drugs), haemolysis (e.g. sulphonamides) or aplasia (e.g. chloramphenicol). •

Treatment of IDA

- ✓ The response to iron therapy is the proof of correctness of DX of IDA.
- ✓ The patients will had reticulocytosis with a peak at 1-2 weeks after therapy and a significant increase in Hb within 3-4 weeks and usually it return to normal within 2-4 months .
- ✓ Therapy could be as oral preparation or paranteral injection or as blood transfusion .
- ✓ Diet therapy is not enough to treat IDA .
- ✓ Oral Iron preparations should be :
 1. It should contain between 30-100 mg of iron .
 2. It should readily release in gastric or duodenal juice ;(i.e.) not retarded (enteric coated) preperation .
 3. Only ferrous iron should be used .
 4. S.E. should be infrequent which is not easy .
 5. The cost should be affordable .

The underlying cause should be treated as far as possible. In addition, iron is given to correct the anaemia and replenish iron stores.

Oral iron •

The best preparation is **ferrous sulphate** which is cheap, contains 67 • mg of iron in each 200 mg tablet and is best given on an empty stomach in doses spaced by at least 6 h.

If side-effects occur (e.g. nausea, abdominal pain, constipation or • diarrhoea), these can be reduced by giving iron with food or by using a preparation of lower iron content (e.g. **ferrous gluconate** which contains less iron (37 mg)per 300 mg tablet).

Parenteral iron •

Ferric hydroxide-sucrose (**Venofer**[®]) is the safest form. It is • administered by slow intravenous injection or infusion, usually 200 mg iron in each infusion.

Iron dextran (**CosmoFer**[®]) can be given as slow injection or infusion • either in small single doses or as a total dose infusion given in one day . It is a colloid suspension ,which is stable , dark brown and slightly acidic ; it contain 50 mg Fe /ml .

Iron sorbitol (**Jectofer**[®]) is given by deep intramuscular injection but • not intravenously.

Thank you