

Extra Notes

Please refer to last year's slides

The last lecture we talked about hemolytic anemia .

This lecture about Anemia caused by decrease PRODUCTION in the bone marrow .

1) Iron deficiency Anemia (IDA)

- the most common worldwide
- Bioavailability : the main source of iron is red meat
- some plants contain iron like Spinach but we can't utilize it
- decrease iron intake in diet common in vegetarians
- increase demand of iron :-
 - * infant : small amount of iron in Milk
 - * younger : fast growing , so we need more iron
 - * elderly : problem in tension ; decrease the absorption
 - * pregnancy .
- also in chronic blood loss , low social economical class and any GI diseases especially in duodenum (Celiac and Inflammatory Bowel Diseases) .

Pathogenesis

- insidious course : need years to build up in the body
- Ferritin (iron store) when it become bigger it's called Hemosiderin => both found in reticular endothelial system (bone marrow) .
- The first place deficiency of iron is bone marrow then in serum ferritin , the last place is serum iron .
- when we measure the iron concentration , we look for serum Ferritin .
- decrease iron so decrease Hb , RBCs are light (hypochromic – microcytic)
 - thalassemia (genetic disease): the same shape of RBC's
 - IDA : variation in the shape of RBC's (poikilocytosis)
 - Poikilocytosis also in pyruvate kinase deficiency
- RDW test (red blood cell distribution width test) is high .
- Iron deficiency block the formation of erythropoietin >> decrease production .
- Thrombocytosis : because activate the production of Megakaryocyte so more platelets .
- Target Cells not specific to thalassemia

Treatment : iron supplement

2) Megaloblastic Anemia

Mega = big

Blastic = immature

- very common , nutritional disease
- erythroid cell in bone marrow >> large & immature

Vitamin B12 deficiency .

- V. B12 in red meat
- Vegans : vegetarians people don't eat any products of meat
- Impaired GI absorption (especially in *ileum*) more common than low intake
- Loss of the storage V.B12 takes a long time
- Important in neuronal tissue (cause dementia)

Folate Deficiency

- in green leaves
- the deficiency of folic acid more common than V.B12 deficiency
- anticonvulsant : prevent absorption of folic acid , so when you use this type of drugs , give the patient course of folic acid .

Folic acid dif. >> anemia

V.B12 dif. >> anemia & neuronal diseases

3) Pernicious Anemia

- V.B12 deficiency
- Make megaloblastic anemia
- Autoimmune disease
- Type 3 antibody destroy parietal cell (low acidity) it become atrophy
- Large cells : more time for maturation
- No central pallor (high Hb) But less number

- Neutrophils

- large nucleus
- hypersegmented (5 to 8) to pass through capillary
- Normal (2-4) segments
- hemolysis : erythropoietin increase but the cells failed (there is problem in the nucleus) >> apoptosis
- most of the cells increase in size but RBC's more effective because more demand for it
- nucleus is lighter

4) Anemia of chronic disease

- chronic inflammatory disease (TB / osteomyelitis)
- chronic = needs long time

Hepcidin :

- decrease iron in RBC's
- not perfect iron deficiency
- in first stage >> normocytic / normochromic
- in last stages >> microcytic / hypochromic

5) Aplastic Anemia

- bone marrow failure (decrease in RBC , WBC and platelets)
- the defect variable in patient

Fanconi Anemia :

- genetic mutation / children
- idiopathic : unknown cause
- idiosyncratic fashion : strange reaction , take different ways from patient to another

Morphology :-

- not obvious
- peripheral blood is low (RBC , WBC , Platelets)
- No splenomegaly

Myelophthisic Anemia

- bone marrow filled with something abnormal >> physical damage
- in cancer , bone marrow tumor , Acute leukemia

Renal Failure

- the uric acid destroy the shape of the cells
- Echinocyte : JUSY in uremia

Chronic Liver diseases

- common bleeding (decrease coagulation factors)
- multiple nutrition deficiency
- Acanthocytes :long projection .

Sorry for any mistake

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