Pahtology sheet #17

**Slide42**

* Nutritional anemia : 1- iron deficiency 2- Vit. B12
* Renal failure ....decreased erythropoietin hormone so decreased erythropoiesis
* We have two types of bone marrow failure : 1-Aplastic anemia “primary without obvious cause” >BM here becomes failing and not producing any cell. 2- due to cancer : in leukemia for ex. , malignant cells proliferate and destroy the normal cells

**Slide43**

* Iron deficiency anemia is the most common anemia worldwide; in all age groups ; children or elderly…men and women
* Usually its due to nutritional causes…as decreased iron intake

* The quantity of iron in other food products is very few,for ex. plants are not a good source of iron….its only in the animal flesh ,like red meat and liver,so these are main source of iron
* as the doctor mentioned in the first lecture , chronic blood loss is associated with iron deficiency anemia, when we lost RBCs we also lose iron, and usually the body don’t compensate for this RBC loss in a good way, so we end with secondary iron deficiency anemia.
* People of increased risk of anemia are ;

-infants (because they depend on the breast-milk which is not a god source of iron),

-elderly (usually they have problems in the diet because of their teeth problems so,they can’t eat well as the adults,

-teenagers (at school age they are susceptible to iron deficiency because they are fast grown plus their dient is not that good “junk food”) ,

-low socioeconomic class (people can’t afford to buy meat are also susceptible)

* Iron is stored as ferritin in : 1) bone marrow 2)blood
* IDA is a chronic disease “insidious “ not as G6P deficiency which occurs in a sudden onset.
* If you test somebody with IDA and the serum iron appears normal this doesn’t mean that they are not ill , if you repeat the test after a while you will fine the serum iron in low levels because the stores of ferritin in bone marrow decreased firstly then the decrease in the blood iron appears.

**Slide44**

* The morphology of RBCs in IDA resembles that in thalassemia “due to decreased Hb production in both casses”
* Target cell appearance : not specific to one type of anemia ,it occurs in IDA , thalassemia and sickle cell anemia
* Therapy is simple by iron supplements

**Slide45**

* Cells are very small “compared the nucleus of the neutrophil” ,and very pale ”normally central pallor shouldn’t exceed 1/3 of the RBC)
* Its morphology differentiated from thalassemia that 1) RBCs in IDA are not having basophilic stipplings 2)elongated and different shapes of RBCs depending on how much iron the single RBC is supplied from the stores ….in thalassemia all cells are copies because the problem is related to genetic disorder

**Slide46**

* Megaloplastic anemia is the second type of nutritional anemia
* Because of the impairment of DNA synthesis in Megaloplastic anemia, RBCs takes a long time of maturation as it needs more time to collect what it needs of Thymidine
* Called with this term because cells are very large (megalo) and the nucleus is immature (plastic)
* Folic acid deficiency does not cause neurologic disorders , just anemia.

**Slide47**

* Vit. B12 deficiency is strictly present in animal products “meat ,eggs, mlik” ,still more than the iron, so NO intake of meat “all types of meat” person would be susceptible to Vit B12 deficiency
* Vegans are the extreme part of vegetarians
* Vit. B12 absorption is via intrinsic factors which is produced by parietal cells in the stomach so it attaches to B12 till it be absorped in small bowel, so any diseas in stomach or in the small bowel affects B12 absorption
* Pernicious anemia is a secondary anemia due to autoimmune disease

**Slide48**

* Folic acid is present in green leaves
* Alcohol, anti-convulsants , contraceptives : interfere with folate absorption,so people who take these drugs also take folic acid supplements along with these drugs
* Methotrexate used in chemotherapy , the way of killing cells is by inhibition of utilization of folic acid
* Folic acid consumption is high in our bodies , so pregnants start to take it from the first month of pregnancy
* iron and B12 takes a long time”1 year for B12” to deplete ,also need a long time “1year for B12” to replenish during treatment,

**Slide49**

* Thymidine is essential for all cells of the body , but the blood cells which are always proliferating , so they are mostly affected …neutrophils are also affected >large size and more segmented nucleus (normally no more than 4 lobes)
* BM=bone marrow
* PB=peripheral blood

**Slide50**

* Appearance of blood cells in MPA

**Slide51**

* Appearance of bone marrow cells in MPA >>>**LARGE AND PALE)IMMATURE) NUCLEUS**

**Slide52**

* Anemia is expected in Chronic inflammatory diseases ,not specific.
* Chronic infection …most popular is TB , HIV
* Autoimmune disease…. Like arthritis
* IL-6 increased in inflammation
* Anemia in chronic diseases starts as normochromic normocytic then it becomes

hypochromic microcytic >> how to differentiat it from iron deficiency ?

we take a biopsy from BM and we stain it for iron , if iron appears in large quantities so anemia is due to chronic disease

also clinically it will be obvious that the patient has a chronic disease

**Slide53**

* Idiopathic=primary means a condition that arises spontaneously or without known cause
* Secondary means known clear cause
* Chloramphenicol and benzene are toxic to stem cells in BM

**Slide54**

* Polycythemia vera is tumer of BM so it produces Blood cells in large quantities …erythropoietin is low because of the feed-back
* Secondary polycythemia occurs in adaptive process> tissues subjected to hypoxia ,common in smokers "its obvious because always PCV there is high induced by high levels of erythropoietin”
* Surreptitious means secret , athletes may cheat by take blood unites of erythropoietin …so this increases their delivery of O2 so better performance.
* Polycythemia is very bad that the increased cell count causes abnormal function and movements of the cells which may cause thrombosis especially in polycythemia vera patients and this is fatal.

**White Blood Cell Disorders**

**Slide1:**

* in contrast to RBC disorders: in RBC disorders most of the diseases are in the deficiency form “anemia”, whilein WBC disorders most of them are due to increased WBCs count “usually neoplastic”
* leukopenia= decreased WBCs count , its opposite to leukocytosis=increased WBCs coun

**Slide2:**

* most WBCs in the blood are Neutrophils ,around %60 of total WBCs , and the second most common WBCs in the blood are Lymphocytes, so any decrease in the count of one of them will highly affect the total number of WBCs, decreased number of the other cells is not in that importance.
* Neutropenia occurs as part of a plastic anemia or , single …..erthroid cells and platlets are normal but the patient has onley neutropenia
* Single neutropenia can be either 1) drug reaction that interferes with the maturation of neutrophils OR 2) congenital :defect at birth
* The main symptom for neutropenia is that patients develop severe bacterial infections ,especially in congenital condition baby every two months came with relapse due to a normal bacteria but it can infect them (non-pathogenic bacteria to normal people)>
* Lymphopenia could be 1)congenital in children 2)due to HIV infection in adults
* The only cause for lymphopenia in adults is HIV infection , HIV infection also may occur in babies that if the mother is infected she can transmit the virus to them.

**Slide3:**

* leukocytosis : 1) non-neoplastic/reactive leukocytosis means that we have certain factors /stimulus that causes increase in WBCs >common in inflammationcount. 2) neoplastic leukocytosis “leukemia”

**Slide4:**

* same as slide

**Slide5:**

* allergic reactions like asthma , allergic rhinitis, eczema, drug ractions

**Slide6:**

* lymphocytosis : increase of lymphocytes in **Blood, Not in the lymph node**

**Slide7:**

* reactive lymphadenitis : reactive means its non-cancerous , its just a reaction due to stimulus …..lymphadenitis means lymph node inflammation
* how can we differatiat it from cancer”lymphoma” ,, acute lymphadenitis 1) develops quickly “rapid quick enlargement of the node” and 2) it is painful so we know from the pain that its benign…lymphoma 1) takes a long time to progress and its 2) painless
* in acute lymphadenitis because of the rapid growth in the lymph node it compresses surrounding capsule and nerves ,so its painful

BUT because lymphoma takes a long time so the capsule also expands and doesn’t affect the nerves

* chronic lymphadenitis also 1) takes a long time to progress and its 2) painless
* after curing from acute lymphadenitis , nodes may stay large but they won’t progress any more and the pain stops , in the case of cancer the node still keeping enlarging

**Slide8:**

* the left figure : the normal shape of the lymph node
* the middle figure : B-cell hyperplasia follicles are enlarged and very numerous
* the right figure : T-cell hyperplasia ,parafollicular cells proliferate at the expenses of the follicles, so we see it as a diffuse growth with no obvious follicles

**Slide9:**

* follicular hyperplasia : follicles are crowded and even fused , and they fill all the space of the lymphnode , normally the follicles found on the periphery and with clear cords and sinuses in the medulla.

**[يقول المنكرون: لا عِلمْ! ، ويقول الحائرون: لا علمَ لنا!، ويقول المؤمنون: "لا علمَ لنا إلا ما علمتَنا" – الرافعي ،السحاب الأحمر](http://hekams.com/?id=4281" \o "يقول المنكرون: (لا عِلمْ! )، ويقول الحائرون: (لا علمَ لنا! )، ويقول المؤمنون: (لا علمَ لنا إلا ما علمتَنا) - مصطفى صادق الرافعي)**

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