By the name of Allah

HLS/pharma/slide1/summary/3rd year medical sts/JU

**Slam everyone, this is a brief summary of the 1st set of slides in pharmacology, I have just written the important few notes we didn’t study or mention with other doctors besides the drugs we are required to know.**

**You will find a summaryand** **mnemonics and at the end .**

Never trust politicians, Taxi drivers and your teachers words they all look easy to you but still they have their own hidden agendas to make u fall :D :D

Take a sip of your coffee and start

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**General notes**

* *Divalent Metal Transporter (DMT1)* actively transports ferrous iron across the luminal membrane of intestine.
* Regulated by mucosal cell iron stores.
* *Ferroportin1(IREG1),* transports iron across the basolateral membrane into the blood.
* Excess iron is stored in the mucosa as *ferritin*, (a water-soluble complex consisting of a core of ferric hydroxide covered by a shell of specialized protein called *apoferritin*).
* Ferritin in serum is in equilibrium with storage ferritin and can estimate body iron stores.(in iron deficiency its conc gets low)
* **Remember** in biochem we took that the the plants or the green leafs iron can’t be utilized easily because it’s bound to complex structures like phyates and oxalate ..etc.
* What about the iron preperations?
* **(Oral Iron Preparations:)**
* Ferrous sulfate.(the Dr said sulfate drugs usually cause diarrhea)
* Ferrous gluconate.
* Ferrous fumarate.
* All are effective and inexpensive.
* **Can cause nausea, epigastric discomfort, cramps, constipation or diarrhea and black stools.**

There are some other preparations via the paraentral route which means the delivery of drugs via the sys circulation and doesn’t involve the GI directly.

**Parenteral Iron Therapy:**

* + Reserved for patients with documented iron deficiency who are unable to tolerate or absorb oral iron and for patients with extensive chronic blood loss who can not be effectively maintained with oral iron alone.
  + Carry the risk of iron overload.(remember: iron overload can also result from repetitive blood transfusions)
  + Some examples of the paraentral preparations:
  + **Iron dextran: (dextran is a polysaccharide)**
  + Given by deep IM injection or IV infusion.
  + IM injection causes local pain and tissue staining (the slow of the release would be slow and this is why the tissue is stained).
  + IV infusion causes hypersensitivity reactions: headache, fever, arthralgia, N(nausea), V(vomiting), back pain, flushing, bronchospasm and rarely anaphylaxis and death.
  + Iron-sucrose complex and
  + Iron sodium gluconate.

**Given only IV** , less likely to cause hypersensitivity.

**Acute Iron Toxicity:**

* Usually results from accidental ingestion by children as well as parenteral iron.
* 10 tablets can be lethal in children.(they think that the tablets are candy :D )
* Causes necrotizing gastroenteritis: vomiting, pain, bloody diarrhea, shock, lethargy and dyspnea.
* Patients may improve but may proceed to metabolic acidosis, coma and death.

Treatment OF **ACUTE** Iron Toxicity:

* Deferoxamine” Desferal”: is a potent iron-chelating compound which binds already absorbed iron and promotes its excretion in urine and feces.
* Whole Bowel Irrigation; to flush out unabsorbed pills.
* Activated charcoal is ineffective.
* Supportive therapy is also necessary.
* **Chronic Iron Toxicity:** Hemochromatosis: Excess iron can deposit in the heart, liver, pancreas, and other organs leading to organ failure might be inherited or acquired for example by blood transfusion (remember: it is a more developed stage of hemosidrosis and can be fatal).
* Treatment of Chronic Iron Toxicity:
* Intermittent phlebotomy (note: Phlebotomy may be done in order to obtain blood for diagnostic tests or to remove blood for treatment purposes (eg, to relieve the iron overload in [hemochromatosis](http://www.medicinenet.com/iron_overload/article.htm) so it is basically a removal of blood here)
* Deferoxamine: is much less efficient than phlebotomy.
* Deferasirox” Exjade”: oral, more convenient than deferoxamine.

**Vitamin B12:**

The active forms are :Methylcobalamine and hydroxocobalamine)

* Source is microbial, from :Meat, liver, eggs, and dairy products.
* Nutritional deficiency only occurs in strict vegetarians.and the daily requirement is 2 mcg.but the storage pool is from300-5000mcg
* *Schilling’s Test:*
* Measures absorption and urinary excretion of radioactively labeled Vitamin B12.

#prenicious anemia:

#Congenital deficiency of the intrinsic factor.

#Congenital selective Vitamin B12 and the problem might be malabsorption !!! (may be in Jordan)

Note: Megaloblastic anemia of Vitamin B12 deficiency can be partially corrected by ingestion of large amounts of folic acid. This is because folic acid can be reduced to dihydrofolate by the enzyme *dihydrofolate reductase.*

The therapy of Vit.B12 defficiency:

Parenteral :

Life-long treatment.

Daily or every other day for 1-2 weeks to replenish the stores.

Maintenance: injections every 1-4 weeks.

Oral:

Only for patients who refuse or can not tolerate injections.(or those who can get benefit of it like vegeterians and they don’t have some congenital problems in the absorption pathway)

Intranasal:

For patients in remission.

Now le’t talk about folic acid: only 5-20mcg can be stored in the liver much less than B12

Remember the drugs we took in patho that increase or cause folate deficiency: Methotrxate, Trimethoprim and Phenytoin

Treatment:

* Parenteral administration is rarely necessary because it is well absorbed orally even in malabsorption.
* 1 mg daily until cause is corrected.
* Or, indefinitely for patients with malabsorption or dietary inadequacy.
* Can be given prophylactically.
* Recently supplemented to foods.

**Mnemonics: Mnemonics: Mnemonics: Mnemonics:**

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| --- | --- | --- |
| The case | Mnemonics | The drugs |
| **Iron deficiency** | Oral: ( FerrOus GulFS ) | Ferrous: ( Gluconate, Fumarate, Sulfate ) so Ferrous form combined to the suitable material |
| **Paraentral (IV,IM ..etc) : Iron**-sugar forms | **Iron**-sugar forms (iron-dextran,iron-sucrose,iron-gluconate) |
| **Acute iron toxicity:** | A cute different exam | cute:for acute, diff and exam are for: defroxamine (this drug can be used in chronic toxicity but the least effective among other drugs) |
| **Chronic iron toxicity** | : hard Flipping OX | (hard for chronic: flipping: phlebotomy OX: for deferasirOX and X for: Exjade the other name of the drug ) |
| **Drugs causing folate deficiency** | Phil try me not the fool | Phil:phenytoin try:trimethoprim Me: methotrexate fool:folate remember we took in patho also ( OCP and Vit b12 defficiency itself) |

Done by: Majida Al-foqara’

Your feedback would be highly appreciated ☺