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Diploma in Pharmacy 2nd Year
Pharmacology
Important Questions
Chapter 6 : Drugs Acting on Blood and Blood Forming Organs

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Chapter 6
Drugs Acting on Blood and Blood Forming Organs
IMPORTANT Questions

Q1. Write the note on Drugs Acting on Blood and Blood Forming Organs.

Ans.

Drugs Acting on blood and Blood forming Organs

- Blood is a fluid connective tissue that transports oxygen, nutrients and growth factors to individual cells of the body.
- The main components of blood are cell (like RBCs, WBCs, platelets), proteins (like coagulation factors, amino acids, growth factors, factors of the complement system), monosaccharide (ribose, glucose), minerals (Na+, K+, Cl-, HCO_3-), and water.
- **Haematologic System :** The system responsible for formation of blood is called Haematlogic System.
- **Haematopoiesis :** The process of blood forming is called Haematopoiesis .

Blood Forming Organs

- **Bone Marrow :** Bone marrow contains cells that produce blood cells and platelets and it is responsible for making billions of new blood cells each day.
- **Spleen :** The spleen stores and filters blood and makes white blood cells that protect you from infection.
- **Liver :** The liver produces proteins that are important in blood clotting. It is also one of the organs that break down old or damaged blood cells.

Q2. What are Hematinic Agents ? Write the classification, pharmacological action, Indication, contraindications, dose, of Hematinic Agents.

Ans.

Hematinic agents

→ The drugs are used to treat Anaemia are called Haematinics.

Or

→ The substances are used to treat deficiency of Iron are called haematinics.

Anaemia

- Anaemia is the decrease in number of red blood cells or hemoglobin content caused by blood loss, deficient erythropoiesis, excessive hemolysis, or combination of these changes.
- Iron deficiency anaemia is probably the most common nutritional deficiency in the world

Types of Drugs are used as Haematinics :

- **Iron :** Ferrous Sulfate, Ferrous Fumarate, Ferrous Ammonium Citrate,
- **Folic acid :** leucovorin, Citrovorum
- **Others :** Pyridoxine, Riboflavin.

Pharmacological Action

- It play an important role in formation of haemoglobin .
- It involves in formation of some Hormone like Thyroid Hormone .
- Iron is necessary for the production of hemoglobin.
- Iron-deficiency can lead to decreased production of hemoglobin and a microcytic, hypochromic anemia.

Indication

- It is used to treat anaemia.
- It is used to treat iron deficiency.

Contraindications:

- Stomach upset
- Nausea
- Vomiting

Dose

- ✓ Ferrous Sulphate 0.3g Tds
- ✓ Ferrous Fumarate 0.2g Tds
- ✓ Ferrous Gluconate 0.6g tds .
- ✓ Ferric Ammonium Citrate 1.0 g tds .
- ✓ Folic Acid : 0.1 -.08 mcg or 1 mg daily

Q3, What are Anti-Coagulants Drugs ? Write the classification, pharmacological action, Indication, contraindications, dose, of Anti-Coagulants Drugs.

Ans.

Anti-Coagulants

- → Agents decreasing the coagulation ability of blood are known as anticoagulants. They do not dissolve clot that have already formed but are used to inhibit the formation of new clots.
- → Examples of these agents are heparin and warfarin. Heparin is given intravenously to patients at risk of formation of thrombus and warfarin is administered orally.
- → The drugs prevent coagulation of blood are called anticoagulants .
- → **Coagulation** (or clotting) is the process through which blood changes from a liquid and becomes thicker, like a gel.

Classification

1. **Injectable Anticaogulants :** Heparin , Ancrod , Lepirudin.
2. **Oral Anticaogulants :**
   - **Coumarin :** Bishydroxy Coumarin ., Warfarin Sodium , Acenocoumarin.
   - **Indandione Derivatives :** Phenindion.

Pharmacological Action

1) **Heparin :**
   - It prevent blood clotting in vivo (inside the body) as well as in Vitro.
   - It Activates antithrombin III , which inactivates factors IX , and X . in this way coagulation is prevented.
2) **Coumarin :**
   - Coagulation factors II , VII , IX and X are present in inactive form , until they are carboxylated.
   - These drugs act on Vitamin K and prevent the synthesis of chemical that carboxylate these factors.

Indications

- Low blood platelets.
- Bleeding
- In unstable angina.
- To prevent coagulation in Heart failure.
- To prevent clotting during open heart surgery.

Contraindications

- Recent trauma ,
- Recent surgery ,
- Recent abortion ,
- Recent stroke ,
- Severe Hypertension ,
- Severe Diabetes ,

Doses

- ✓ Heparin 5000-10000 unit /ml i.v
- ✓ Warfarin 5-10 mg /d

Q4. What are Anti-Platelet Drugs ? Write the classification, pharmacological action, Indication, contraindications, dose, of Anti-Platelet Drugs.

Ans.

Anti-Platelet Agents

- The drugs prevent platelet aggregation are called Anti- Platelet drugs .
- Also Known as Anti – Thrombotic Drugs
- Platelet aggregation, the process by which platelets adhere to each other at sites of vascular injury, has long been recognized as critical for hemostatic plug formation and thrombosis.

Classification

- Thromboxan (TxA2) synthesis Inhibitors : Low dose of Aspirin , Dazoxiben.
- Phosphodiesterase Inhibitors : Dipyridamol.
- ADP - Induced Platelet Aggregation Inhibitors : Ticlopidine , Clopidogrel.
- Glycoprotein IIb / IIIa receptor Blockers : Tirofiban , Eptifibatide.

Pharmacological Action

- **Thromboxan (TxA2) synthesis Inhibitors :** Low dose of Aspirin . acts on Cox 1 and reduces the production of TXA2 . (this TxA2 causes platelet aggregation)
- **Phosphodiesterase Inhibitors :** Dipyridamol . It increases the concentration of cyclic adenosine monophosphate (cAMP) levels and it prevents platelet aggregation.
- **ADP - Induced Platelet Aggregation Inhibitors :** Ticlopidine , Clopidogrel . It blocks the P2 Y12 receptor of platelet , which activates the platelets and cause aggregation.
- **Glycoprotein IIb / IIIa receptor Blockers :** Tirofiban , Eptifibatide . They block Glycoprotein IIb / IIIa receptor of platelet which activates platelet aggregation.

Indications

- As a Anti-Platelet
- Unstable angina
- Acute MI
- In Post MI Patients
- Cerebrovascular Diseases
- Prosthetic heart valves (artificial valve)

Contraindications

- Severe diabetes
- Liver damage
- Peptic ulcer

Dose

- ✓ Aspirin 75-150mg /d oral
- ✓ Dipyridamol 150-300 mg /d
- ✓ Ticlopidine 250- 500 mg /d
- ✓ Tirofiban 0.4mcg/kg/min i.v.

Q5. Give brief note on Thrombolytic Drugs.

Ans.

Thrombolytic Drugs (Fibrinolytics)

→ Also Known as Fibrinolytics.

→ These are those drugs which are used to breaks the clot/thrombus, inside the blood vessels (mainly in coronary artery)

→ The give their action by activating fibinolytic system.

Classification

1. **Non-fibrin specific**
    - Streptokinase
    - Anistreplase
    - Urokinase
2. **Fibrin specific**
    - Tissue plasminogen Activators (t-PA)
    - Alteplase
    - Reteplase
    - Tenecteplase

Pharmacological Actions

- Thrombolytic work by dissolving a major clot quickly.
- This helps restart blood flow to the heart and helps prevent damage to the heart muscle.
- Thrombolytic can stop a heart attack that would otherwise be larger or potentially deadly.

Indication:

- Stroke
- Myocardial Infarction
- Used for dissolving the clotting

Contraindications:

- Pregnancy
- Bleeding disorder
- Diabetics
- Cardiovascular disorder

Doses

- ✓ Urokinase 4400 IU/kg
- ✓ Alteplase For MI 15 mg i.v. For pulmonary embolism 100mg i.v
- ✓ Streptokinase 250,000 IU /2ml