

Bleeding

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Bleeding disorders

- Are group of conditions that appear when blood cannot clot properly.
- **In normal clotting : platelets, form the platelet plug , which then stabilized with fibrin to prevent blood loss.**
- **Too much clotting >>> thrombosis**
- **While inability to clot >>>> bleeding**

- Three major causes of bleeding:

1. vascular disorders

2. platelet disorders : low platelets

(thrombocytopenia) , causes may be : anemia ,
drugs.

3. Coagulation factor disorders : hereditary such
as haemophilia , drugs such as warfarin.

- **Drugs for Bleeding :**

1. Biological Fluids

2. Haemostatic Drugs

1. Biological Fluids:

I. Red blood cells transfusions

➤ Improve oxygen carrying capacity of blood

– Bleeding

– Chronic anemia that is symptomatic

– Peri-operative management

➤ Red blood cell transfusions adverse reactions are :

❖ Immunologic reactions

❖ Non-immunologic reactions

• Congestive heart failure Volume overload

• Fever and shock Bacterial contamination

• Hypocalcemia Massive transfusion

❖ Transfusion-transmitted disease

II. Platelet transfusions

- Target level
 - Bone marrow suppressed patient ($>10-20,000/\mu\text{l}$)
 - _ Bleeding/surgical patient ($>50,000/\mu\text{l}$)

- Platelet transfusions – complications:
 - ❖ Bacterial contamination
 - ❖ Autoimmune destruction of platelets
 - ❖ Non-immune :
 - hemolytic anemia
 - Coagulopathy

III. Fresh frozen plasma(plasma fractions)

- Deficiencies in plasma coagulation factors can lead to bleeding.
- Spontaneous bleeding occurs when activity is less than 5- 10% of normal.
- The most coagulation defects are the deficiency of factor (VIII , IX) which are called haemophilia A and B respectively.
- Concentrated plasma fractions are available for treatment.

2. Haemostatic Drugs

1. vitamin K :

- A fat soluble vitamin , found in leafy green vegetables.
- Dietary requirements are low because it is also synthesized by the **bacterial flora**.
- It is important for the carboxylation of factor (X,IX,VII,II) .

- There are two forms of Vit K :
- Vitamin K1 (phytonadione) found in food.
 - Is available for clinical uses (oral and IV).
 - IV administration should be slow to avoid :
Dyspnea, chest pain , back pain and even death.
- Vitamin K2 (menaquinone) found in human tissue and is synthesized by bacterial flora.

2. Fibrinolytic Inhibitors:

- Aminocaproic acid : a synthetic inhibitor of fibrinolysis , it inhibits plasminogen activation.
- **Clinical uses:**
 - adjunct therapy in haemophilia
 - To reverse bleeding from fibrinolytics.
- **Side effects**
 - GI toxicity
 - Thrombi formation

Tranxmaic acid is analogue of Aminocaproic acid.

3. Desmopressin acetate:

increase factor VIII activity.

– Increased release of VWF from endothelium

- **Uses**

- Most patients with von Wille brand disease

- Mild hemophilia A

- **Side effects**

- Facial flushing and headache

- Water retention and hyponatremia

4. Oxytocin: used to control post partum haemorrhage.

❖ **New Drugs :**

Recombinant human factor VIIa (rhVIIa)

- **Mechanism**
 - Direct activation of common pathway
- **Use**
 - Factor VIII inhibition
 - Bleeding with other clotting disorders
 - Warfarin overdose with bleeding
 - CNS bleeding with or without warfarin