Platelets

Platelets or thrombocytes are the formed elements of blood. Platelets are small colorless, non-nucleated and considered to be the fragments of cytoplasm.

Normal Count and Variations

Normal platelet count is 2,50,000/cu mm of blood. It ranges between 2,00,000 and 4,00,000/cu mm of blood.

Physiological Variations

1. Age: Platelets are less in infants (1,50,000 to 2,00,000/cu mm) and reaches normal level at 3rd month after birth.

2. Sex: There is no difference in the platelet count between males and females. In females, it is reduced during menstruation.

3. After meals: After taking food, the platelet count increases.

Functions of Platelets

Normally, platelets are inactive and execute their actions only when activated.

1. Role in blood clotting

Platelets are responsible for the formation of prothrombin activator. This substance is responsible for the onset of blood clotting.

2. Role in clot retraction

In the blood clot, blood cells including platelets are entrapped in between the fibrin threads.

3. Role in prevention of blood loss (hemostasis)

By formation of temporary plug, the platelets seal the damage in blood vessels.

4. Role in repair of ruptured blood vessel

There are substances formed in cytoplasm of platelets is useful for the repair of the endothelium and other structures of the ruptured blood vessels.

5. Role in defense mechanism

By the property of agglutination, platelets encircle the foreign bodies and destroy them.

Thrombocytosis
Increase in platelet count is called thrombocytosis. It occurs in the following conditions: Allergic conditions, surgical operations and Trauma (wound or injury or damage caused by external force).

Hemostasis

Hemostasis is defined as arrest or stoppage of bleeding. For bleeding to take place from a vessel, a break must be present in the vessel wall and the pressure inside must be greater than the pressure outside the vessel to force blood out through the defect.

It includes several stages:

1- Vasoconstriction.
2- Platelet plug formation.
3- Coagulation of blood.

Stages of Hemostasis

When a blood vessel is injured, the injury initiates a series of reactions, resulting in hemostasis. It occurs in three stage:

1. **Vasoconstriction**: Immediately after injury, the blood vessel constricts and decreases the loss of blood from damaged portion. Usually, arterioles and small arteries constrict.

2. **Platelet plug formation**: Platelets get adhered to the collagen of ruptured blood vessel and secrete adenosine diphosphate (ADP) and thromboxane A2. These two substances attract more and more platelets and activate them. All these platelets aggregate together and form a loose temporary platelet plug or temporary hemostatic plug, which closes the ruptured vessel and prevents further blood loss.

3. **Coagulation of blood**: During this process, the fibrinogen is converted into fibrin. Fibrin threads get attached to the loose platelet plug, which blocks the ruptured part of blood vessels and prevents further blood loss completely.