Topic: HUMAN PHYSIOLOGY

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Immunity

Lymphocytes

Lymphocytes are associated with the protection of the body against foreign material. There are 2 types of lymphocytes that function. They are,

- a) T-lymphocytes
- b) B lymphocytes.

These are found in lymph node and spleen. Antigens are foreign bodies such as bacteria, virus or any toxin that enters the body. The T-lymphocytes produce a number of chemical substances that act against antigens such as viruses, pollen, fungi and bacteria. The B - lymphocytes produce antibodies that ingests the foreign particles.

Types of Immunity.

1. Active Immunity: Here the individual responds to an antigen and produces antibodies specific to one microbe. This can be natural or artificial.

2. Passive Immunity: Here the individual is given antibodies produced by someone else. The readymade antibodies are injected into the infected person.

Acquired Immuno Deficiency Syndrome (AIDS)

This condition is caused by the human immune deficiency virus (HIV). HIV acts mainly on T - lymphocytes. When they are infected their number is reduced, causing suppression of T-cell immunity leading to infections such as pneumonia, tuberculosis and malignant tumours.

Platelets

They are also termed as thrombocytes. These are small disc-shaped cells without a nucleus about one third the size of the red blood cells. There are about 2 to 5 lakhs of platelets in each cu.mm. of blood. They play an important part in the control of bleeding after injury and in the clotting of blood.

Blood Clotting

Blood maintains its liquid state as long as it remains in the blood vessel. If it is drawn from the body, it thickens and forms a jelly. This jelly or clot contracts or shrinks and a straw-coloured fluid called serum is squeezed out from it. If shed blood is microscopically examined, very fine threads will be seen. These threads entangle the blood cells and together with them form the clot. The process of clotting is called **blood coagulation** or **haemostasis.** Its purpose is to prevent blood loss when a blood vessel is ruptured. The normal coagulation time varies from 3 to 8 minutes.

Clotting mechanism

Four substances are necessary for the coagulation of blood: prothrombin, thromboplastin, calcium and fibrinogen. Fibrinogen, prothrombin and calcium are present in the circulating blood. Thromboplastin is present in the tissues. When the blood is shed thromboplastin is liberated from the injured tissue. The thromboplastin acting upon the prothrombin in the presence of calcium converts into active thrombin. Thrombin acts in turn upon the soluble protein fibrinogen converting it to insoluble fibrin which is deposited as fine threads to form the framework of the clot.

The clotting mechanism can be given as follows :-Prothrombin + Calcium + Thromboplastin Thrombin (inactive) (active) Thrombin+Fibrinogen --Fibrin (Soluble) (Threads).