

B.N. Bandodkar College of Science, Thane

Zoology – II

Haemorrhage

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## Haemorrhage

Escape of blood from ruptured or injured blood vessel is called haemorrhage.

The effect of haemorrhage depends on the **amount and rapidity of blood loss** and the **efficiency of the compensatory power** of the subject i.e. injured person.

**Severe haemorrhage** leads to **circulatory collapse and death**.

If **haemorrhage is moderate** and person is healthy, **compensatory changes take place** and normal condition is maintained.

### Haemorrhage produces following changes

A) Vascular and cardiac disturbances : Haemorrhage causes

- 1) Decrease in blood volume , decrease in blood pressure ,  
Due to decreased blood volume, cardiac output decreases which results in vasoconstriction ( contraction of blood vessel)
- 2) Vasoconstriction leads to increased peripheral resistance. Due to vasoconstriction more blood is propelled to heart.
- 3) Due to constriction of arterioles less blood flows to the skin, muscles and splanchnic area i.e. abdominal area.
- 4) Pressure in the capillaries falls and less amount of fluid passes from blood to the tissues spaces instead fluid from tissue spaces enters the blood to keep the blood volume constant.

If haemorrhage is slow , blood pressure is maintained for sometime, but if haemorrhage is severe ,cardiac output falls down and there is diminution of peripheral resistance which results in dilation of blood vessels.

All leads to fall in blood pressure. Heart rate falls down and less blood flows towards brain which leads to sudden loss of consciousness or fainting . severe haemorrhage Also causes less blood flows to the skin. Skin becomes pale and cold (pallor of skin) as there is less evaporation of sweat.

B) Respiratory disturbances :

Rate and depth of respiration increases .Due to low B.P.and anoxia( less  $O_2$  ) there is excess  $CO_2$  in the blood.

- C) Renal change : Due to severe haemorrhage volume of urine decreases This is due to renal vasoconstriction and less circulation of blood. Due to less urine formation, nitrogen retention takes place in the blood which leads to Azotemia or Uraemia and renal tubular damage may occur.
- D) In case of severe haemorrhage , Neurohormones like adrenaline and noradrenaline are secreted because of reflex action of chemoreceptors and person get excited. Excitement leads to further vasoconstriction and increase in heart rate.

### **Compensatory changes by body :**

There is immediate need to maintain B.P. so following changes takes place

#### I ) Changes in cardiovascular System.

Heart rate increases to maintain cardiac output which is lowered by low B.P.

II ) Vasoconstriction occurs because of anoxia which stimulates vasomotor centre through the chemoreceptors of sinoarotic nerves which secrete adrenaline and noradrenaline

which leads to further vasoconstriction and increased heart rate

III) Spleen and mesenteric blood vessels contract and more blood cells are added to the circulation.

VI) To compensate blood loss stored blood in the liver is also added to the circulation.

V) Changes in Respiration : Both rate and depth of respiration increase to supply more oxygen to the body.

**Restoration of Blood :** The lost blood is regained by the body. At first the fluid part then plasma proteins and lastly the RBC.

To maintain the blood volume, fluid from tissue spaces is drawn and added into the circulating blood. Injured person feels thirsty, drinks lot of water which also help in restoring the blood volume.

Stored proteins are mobilized within few hours from the tissues and organ like liver and also

Manufactured by the liver, first fibrinogen then globulin and finally albumin. RBC are manufactured by red bone marrow .Anoxia stimulates haematopoiesis

Within 3-5 weeks RBC and Hb are restored.

In case of severe Haemorrhage , whole blood transfusion is given to restore the blood volume.