بسم الله الرحمن الرحيم
BLOOD TRANSFUSION ( Haemorrhage)

*Classification of haemorrhage according to the *vessels* involved
1) Capillary haemorrhage.  2) Venous haemorrhage.  3) Arterial haemorrhage.

*Classification according to the *site*
1) External haemorrhage  2) Internal haemorrhage

*Classification according to the *Time*
1) Primary haemorrhage.  2) Recationary haemorrhage  3) Secondary haemorrhage.

Complications: Shock, anaemia, renal failure, coronary or cerebral thrombosis and local infection
2-Oligaemic Shock (Surgical or Hypovolaemic Shock)

This may be due to loss of blood as in haemorrhage or plasma as in burns. 

Oligemia is corrected by various mechanisms.

1- Stimulation of the carotid sinus reflexes which cause acceleration of the heart and peripheral vasoconstriction.

2- Stimulation of the adrenal medulla, the adrenaline flooding the circulation helps to cause vasoconstriction.

3- Contraction of the spleen plays minor role.

4- Passage of fluids from the tissue to the blood vessels causes haemodilution and expands the blood volume.
Measurements needed in shock.

1- Urine output. A urinary output less than 0.5 cc / minute or 30 ml / hour indicates severe shock. However a shocked patient may not urinate for first 24 hours.

2- Central venous pressure (CVP). It is decreased in neurogenic and in oligamnic shock. And increased in cardiogenic shock and is variable in septic shock.

3- Arterial blood gases: Normal values are: PO2; 100, PCO2 : 40, P.H: 7.4. In hypovolemia these are changed as mentioned before.

4- Haematocrit: Haemoconcetration early sign of shock.

5- Arterial blood lactate: In shock lactic acid accumulates due to failure of cellular oxygenation.
Clinical features:

A) **Mild Shock (up to 20% blood volume loss)**

Non vital organs are mainly affected (skin, muscle, or bones). Clinically there is pallor, cool skin and the patient complains of feeling cold. Tachycardia may or may not be present.

B) **Moderate Shock (up to 40% blood volume loss)**

Here the kidneys, liver and gut are affected.Clinically there is hypotension, tachycardia and oliguria or anuria. Urine output is less than 0.5 cc/kgm/hour indicates marked hypovolemia.

**The Pulse** rates cannot be taken as an absolute indicators to the degree of shock as it may remain normal in old patients inspite of marked loss of blood. Possibly aging decrease the sensitivity of *Sinoauricular nod* (S.A.nod) to a fall in the blood pressure.
C) Severe Shock (more than 40% blood volume loss).

The heart and brain are affected.

Clinically there is restlessness, agitation, coma, arrhythmias and finally cardiac arrest.

Thirst is an annoying feature which is usually observed in shock due to inhibition of the function of the salivary glands in response to diminution of the blood volume.

Respiration may be rapid and shallow especially in cases of wound of the chest.
1-Posture: Raising the foot not effective in Neurogenic shock and may leads to respiratory embarrassment.

2-Sedation: IV Morphia - disadvantage are 1. depression to respiration 2-mask signs of internal injury or peritonitis.

3-Charts and repeated observations
Temperature, pulse, and blood pressure are observed half hourly and the amount of urine passed is measured, shocked patients may not urinate until 12 to 24 hours after the onset.
4- Fluid therapy:
   by blood, plasma, dextran, saline
   -Blood transfusion        - Plasma Infusions
   -Dextrose saline infusions are essential
   -Dextran infusions not more than one liter
     it may causing pseudo-agglutination of erythrocytes or DIC

5- Oxygen therapy:
   To supports respiration.
6-Alpha blockers:
May help tissue perfusion. Phenoxycybenzamineb 1 mg/kg as decrease work done by the heart, and decrease peripheral resistance. It has antihistamine and antiserotonin effect. Chlorpromazine given in small doses it has alpha blocking action.

7-Corticosteroids
It needed to protect against endotoxins, big doses have an alpha blocking action, mainly used in septic shock.

8- Sodium bicarbonate
In treating metabolic acidosis.
Indications of blood transfusion

1) Surgical Indications:
1- Haemorrhage and shock
2- To replace blood before, during and after operation
3- Insever infections causing toxaemia, septicaemia or pyaemia.
4- To prime the machine, in the artificial kidney and the heart-lung machine
II) Medical Indications:
1) Sever anaemia.
2) Leucocytosis and agranulocytosis
3) Sever hypoproteinaemia
4) Exchange transfusion in cases of erythroblastosis.
5) Haemorrhagic disease as haemophilia and obstructive jaundice.
1) Haemolytic reaction: In the form of fever, chills, flushing, headache, tight constricting pain in the chest, nausea and pain in the loins. Vomiting, diarrhoea, haemoglobinuria and oozing from the wound may follow. Anaesthetised or comatose patients show unexplained tachycardia hypotension or bleeding.
TT: “Stop Transfusion”
1- Oxygen inhalation, vasopressors
2- Bicarbonates and mannitol, to prevents acute tubular necrosis.

2) Pyrexial reactions:
C/P Like haemolytic reaction
IT is the commonist side effect tt. by Antipyretics

3) Allergic reactions:
C/P Itching and diffuse rash, laryngeal oedema and collapse

TT: By “Stop Transfusion” Antihistaminics. Steroid
4) Contaminated blood:
Chills, fever, general pain, hypotension and shock mostly due to endotoxines of gram-negative bacteria.
TT. By antibiotics, fluid replacement, steroids.

5) Microcirculation blockade
Micro-emboli from banked blood may accumulate in the lung causing respiratory distress. A 40-micron mesh filter is used.

6) Transmission of disease:
Malaria, hepatitis, syphilis and A.I.D.s
7) Hyperkalaemia
Potassium is lost from R B Cs to plasma. May lead to cardiac arrhythmias or arrest.

8) Citrate intoxication
TT By calcium gluconate slowly

9) Cardiac arrest:
Due to hyperkalaemia, excess citrates and hypothermia.

10) Hepatic coma
Due to excessive in amonia makes old blood unsuitable for patients with hepatic cirrhosis
11) Haemorrhagic diathesis
   Similar to D.I.C. syndrome.
12) Other complications:
   Air embolism, phlebitis, volume overload
شكرا بالتوقيع

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