

* Shock *

27/March
Friday

Def: Shock is a life threatening clinical syndrome of cardiovascular collapse characterized by

- ✓ an acute reduction of effective circulating blood volume (hypotension)
- ✓ an inadequate perfusion of cells & tissues
(hypoperfusion)
↓ passage of blood in B.V. in organ/tissue
or components of blood

Shock is a :

If uncompensated, these mechanism may lead to impaired cellular metabolism & death.

Shock is a circulatory imbalance b/w O₂ supply & O₂ requirements at cellular level & is also called as circulatory shock.

* Shock is used for transient and usually a benign vasovagal (sudden drop in HR, BP leading to fainting) attack resulting from sudden reduction of venous return to heart caused by neurogenic vasodilation & consequent peripheral pooling of blood.
Rate of blood flowing back to heart

eg: immediately following trauma, severe pain (or) emotional over rxn, such as due to fear, sorrow or surprise.

* Clinically pts of 1st shock suffer from the attack lasting for a few seconds or min, &

develop brief unconsciousness, weakness
sinking sensation, pale and low B.P.

* Another type of shock which is not due to
circulatory dearrangement is anaphylactic
shock is from type-1 immunologic reaction.

* Tissue shock is from which occurs due
to haemodynamic (flow of blood within organ)
tissue

dearrangements & hypoperfusion of cells

this is the type which commonly refer
to as shock.

CLASSIFICATION OF ETIOLOGY

1) Hypovolaemic shock

This form of shock results from
inadequate circulatory blood volume by
various etiologic factors that may be either
from the loss of red cell mass & plasma
from haemorrhage, or from the loss of
plasma volume alone.

2) Cardiogenic shock:

Acute circulatory failure
↓ sudden
Fall in C.O from acute diseases of heart
without acute reduction of blood volume
↓ results in
Cardiogenic shock.

3) Septic shock

Severe bacterial infections (or)

↓

Septicaemia induce septic shock

↓ It may be

Result in gram (-ve) septicemia.

* Which is more common or gram +ve septicemia.

Other types:-

1) Traumatic shock:-

Shock resulting from trauma is

↓ initially due to

Hypovolaemia

↓ but even after haemorrhage

has been controlled

↓ the pts continue to suffer

loss of plasma volume into the

interstitium of injured tissue.

2) Neurogenic shock:- NS

↓

Result from causes of

interruption of sympathetic vasomotor supply

Pathogenesis:-

In general, all forms of shock involve following 3 derangements.

- ✓ Reduced effective circulating blood volume
- ✓ Reduced supply of O₂ to cell & tissue
- ✓ Resultant anoxia

• Inflammatory mediators and toxins released from shock induced cell injury.

These derangements initially set in compensatory mechanism but eventually a vicious cycle & cell injury and severe cellular dysfunction lead to breakdown of organ function.

Reduced Effective Circulatory Blood Volume

It may result by either of the following mechanism.

- * By actual loss of Blood volume as occurs in hypovolaemic shock.
- * By ↓ed cardiac output without actual loss of Blood as occurs in cardiogenic shock.
- Septic shock

Impaired tissue oxygenation

Reduction in effective circulatory by from either of above 2 mech and from any of the etiologic agents.

There is ↓ed venous return to heart
↓ result

in ↓ed cardiac output

- * This consequently causes reduced supply of O_2 to the organs & tissues &

↓ hence tissues anoxia, which sets in cellular injury.

Release of Inflammatory Mediators

In Response to cellular injury
innate immunity of Body gets
↓ activity

as body defence mechanism

↓ and release

inflammatory mediators

- Endotoxins in bacterial wall in septic shock stimulate massive release of pro-inflammatory mediators (cytokines) but a similar process of release of these agents take place in late stages of shock.

Pathogenesis of shock:

↓ effective circulating Blood volume

↓

↓ venous return to heart

↓

↓ C.O

↓

↓ B.F

↓

↓ supply of O_2

↓

Anoxia

↓

inflammatory mediators

↓

[Shock]

Pathogenesis of Hypovolaemic shock:

Hypovolaemic shock occurs from inadequate circulating Blood volume due to various causes.

The major effects of hypovolaemic shock are

↓ due

↓ used cardiac output & low intracardiac pressure

The severity of clinical features depends upon degree of Blood volume lost, haemorrhagic shock is divided in (4 types)

<1000ml - compensated

1-1500ml - Mild

15-2000ml - moderate

2000ml - severe

↑HR, ↓BP, low urinary output and alteration in mental state

Pathogenesis of cardiogenic shock

Cardiogenic shock result from severe left ventricular dysfunction from various causes

↓

↓ Cardiac output

Movement of fluid from pulmonary vasculature into pulmonary interstitial space initially

- and later into

alveolar spaces

[2000]