

Shock

MOF

- ≥ 2 failed organ systems.
- Due to prolonged systemic ischemia & reperfusion injury.
- Management: supporting organ system with ventilation, cardiovascular support, hemofiltration/ dialysis
- Mortality $>60\%$.
- So early aggressive treatment of shock.

Resuscitation

- Ensure airway & breathing
- Cardiovascular resuscitation- circulation
- If doubt about shock---- assume as hypovolemic & start fluid resuscitation
- Active bleeding patients--- resuscitation & surgical hemorrhage control should go in parallel
- Bowel obstruction---- adequate fluid resuscitation before operation.

Fluid therapy

- In all shock, 1st correct hypovolemia & inadequate preload.
- Intravenous access-- wide bore iv needles... 16G/18G
CVP line
- ? Fluid.
 - No ideal fluids
 - Crystalloids Vs colloids
 - 1.3 times more crystalloids than colloids administered.
 - Thus little evidence to support colloids
 - Hypotonic solutions like 5% dextrose---- poor volume expander so not used in the t/t of shock.

Fluid therapy

- It is dynamic process, supplement acc. to deficit
- Infuse bolus of fluid ~ 250-500ml over 5-10 min----see response
- Responder: improvements in CVS status--- sustained no active fluid loss
- Transient responders: transient improvement moderate on going fluid loss
- Non-responders: major ongoing fluid loss with severe volume depletion. Eg uncontrolled hemorrhage.

Vasopressor or Inotropic support

- Not as 1st line therapy in hypovolemic shock
- Vasopressor: phenylephrine, noradrenaline
 - Useful distributive shock (peripheral vasodilation & low systemic vascular resistance).
- Inotropes: dobutamine, adrenaline, severe septic
 - Cardiogenic shock, severe septic shock

Monitoring

- Admit in high dependency unit
- Monitor:
 - Minimum: HR, SPO2, BP, urine output
 - Additional: CVP, invasive BP, CO, base deficit, lactate.
- Systemic perfusion monitoring:
 - Urine output--- best indicator of organ perfusion
 - Cerebral perfusion: conscious level
 - GI tract/ muscle: lactate, base deficit
- Septic shock:
 - Antibiotic coverage.

Sterile precautions

- Sterilisation vs disinfection
- Antisepsis
- Operative room:
 - Double door entrance from the anesthetic room & double door exit into clean corridor
 - Also small door entrance to clean store room---sutures, dressing
 - Exit door to dirty corridor.
 - Operating table, lights

Control of air quality

- Theatres fitted with controlled ventilation & filters
- 20 air changes per hour using a 5 mm pore size filter.
- < 200 CFU/ m³
- In orthopedic surgery --- < 10 CFU/ m³.
- Other measures:
 - Reduction of no of individuals in theatres
 - Avoid excess movements in theatre
 - Close all doors, air vents functioning

Sterilisation

- Steam sterilisation:
 - Steam under pressure--- autoclave
 - 134 °C (30lb/in²) x 3 min
 - 121 °C (15lb/in²) x 15 min
 - Instruments, gauze, dressings, drapes
 - Monitoring of autoclave:
 - Steam penetration test
 - Chemical indicators
- Ethylene: highly penetrating non-corrosive gas, broad spectrum cidal effect, useful for heat sensitive materials
- Hot air: less effective, not-useful for rubber, plastic, iv fluids (denaturation)
- Irradiation: gamma rays
- Low resistance steam & formaldehyde:
 - Sterilisation achieved at low temperature----- 73°C
 - Useful for heat sensitive materials & those with plastic component.

Disinfectants

- Reduction of microoragnism to a level that it is no longer becomes a health problem
 - High level: cidal to spores, viruses & bacteria
 - Medium: cidal to bacteria & virues
 - Low : cidal to only bacteria & viruses of low resistance.
- Disinfection with low temp steam:
 - Dry saturated steam at temp of 73 °C for 20 min.
- Disinfection with boiling water:
 - 100°C for 5 min
- Disinfection with formaldehyde: broad spectrum antimicrobial
- Disinfection with gluteraldehyde: 2% solution
 - Useful for flexible endoscopes, heat sensitive instruments

Operation theatre

- Theatre staff:
 - Bacterial infection: don't enter OT
 - Infected skin lesion– boil, paronychia, carbuncle
 - URTI
 - Showering
 - Clothing & gowning
 - Masks
 - Gloving
 - Scrubbing up: chlohexidine, povidine iodine soap
3-5min

The Operation

- Preoperative patient preparation:
 - Showering/ Shaving
 - Prophylactic antibiotics
 - Short preoperative hospital stay
- Skin preparation:
 - Antiseptic solution--- chlorhexidine, povidine iodine
 - Allow the paint to dry off
- The procedure:
 - High standard of asepsis
 - Proper performance of surgery
 - Careful handling of instruments
 - Sharp objects kept in receiver– kidney tray
 - Preliminary count before surgery
 - Disposable instruments esp blood contaminated should be discarded in labelled container
 - Swab counting

High risk infection procedures

- Careful protocols for handling of blood & body fluids to reduce infection----
Hep B, C, HIV
- Staff education: hep B vaccination
- Identification of high risk patients in OT list
- Reduction of no of staf in OT
- Removal of all extraneous equipments from OT
- Avoid contact with body fluids, blood esp if there is abraision on skin
- Use of non- permeable gown, mask with eye protection, gloves---double
- Care in handling of sharp instruments
- Disposable instruments kept in yellow bags, sealed n double bagged with hazard label
- Soiled linen placed in special bags n sent to laundry clearly marked
- After surgery, floor cleaned with detergent, hypochlorite solution