HYPOVOLEMIC SHOCK

○ **Definition:**

Hypovolemic shock refers to a medical or surgical condition in which rapid fluid loss results in multiple organ failure due to inadequate circulating volume and subsequent inadequate perfusion, can be divided into two categories: hemorrhagic and nonhemorrhagic.

○ **Etiology:**

1. Decreased blood (plasma + red blood cells) volume
   - **External:** Surgery or trauma
   - **Internal** (eg, cerebral, chest, GI and other abdominal sources, long bone fractures, and retroperitoneum)

2. Decreased plasma volume
   - **External:** Losses from urine, GI tract (eg, vomiting, nasogastric suctioning, fistula, and diarrhea), lungs, or skin (including thermal injury)
   - **Internal** (decreased oncotic pressure or increased capillary permeability): fluid accumulation in bowel, peritoneal or pleural cavities
Clinical Presentation:

**Signs**

- Increases in heart rate (e.g., greater than 120 beats/min)
- Respiratory rate (e.g., greater than 30 breaths/min)
- Agitation may be present if the patient is conscious
- Mental status changes or unconsciousness may occur
- Blood pressure would be decreased (e.g., systolic blood pressure less than 90 mm Hg)
- Decreased capillary refill
- Cold extremities
- Body temperature would be low or normal (e.g., 36°C-37°C)

**Symptoms**

- Thirst
- Nausea
- Anxiousness
- Weakness
- Light-headedness
- Dizziness
- Scanty urine output
- Dark yellow urine
o Diagnosis:

The diagnosis of Hypovolemic shock is initially based upon the history, physical examination and laboratory studies should include analysis of the:

- CBC, electrolyte levels (eg, Na, K, Cl, HCO₃, BUN, creatinine, glucose levels).
- Lactate
- prothrombin time, activated partial thromboplastin time
- ABGs.
- urinalysis
Treatment:

**First line: Crystalloid solutions** (effective and inexpensive, for patients with severe volume depletion or hypovolemic shock not due to bleeding, especially when volumes ≤ 2 L are being administered)

- **Sodium chloride injection 0.9%**: (not preferred in large volume resuscitation (> 2 L) because may be associated with the development of a hyperchloremic metabolic acidosis)
- **Lactated Ringer’s injection**: (avoided in patients with hyperkalemia, may be associated with the development of peripheral edema)
- **Plasma-Lyte A**
- **0.45% Sodium chloride injection, with added sodium bicarbonate**

**Second line: Colloid solutions** (use in those with limited response to crystalloid solutions or those in whom hypoalbuminemia is thought to be contributing to shock, more rapid plasma volume expansion than saline)

- **Albumin**: (preferred in hypoalbuminemia, and may be cause Allergic reactions, Transmitted infection)
- **Hyperoncotic starch (eg, dextran, gelatin)**: (avoided use because may be associated with an increased risk of acute kidney injury, and may be cause Coagulopathy, Pruritus, Anaphylactoid reactions)

**Vasopressors**: Vasopressors (eg, norepinephrine) generally should not be administered, since they do not correct the primary problem and, in the absence of adequate resuscitation, tend to further reduce tissue perfusion

**NOTE**: The rate of fluid repletion should be individualized depending upon the underlying etiology and rate of fluid loss, estimated total body deficit, underlying electrolyte abnormalities, and predicted future losses, which can be hard to predict if fluid loss continues from persistent bleeding or third space sequestration
Monitorin:

Monitoring Clinical parameters including heart rate, blood pressure (systolic blood pressure (SBP)), urine output, skin turgor, mucus membrane integrity, and mental status, Pulmonary artery occlusion pressure, Central venous pressure should be continuously followed during fluid replacement to assess the efficacy of volume replacement. Measuring laboratory parameters including chemistries and lactate level.

Reference:


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