The Patient is In Shock!

Do you treat them all the same?

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Objectives

At the end of the session, the learner shall be able to:

1. Identify symptoms of shock
2. Differentiate types of shock
3. Describe treatments of shock
4. State special considerations in the geriatric and pediatric populations

Definition of Shock

- Shock is caused by lack of blood and oxygen to the cells of the body, resulting in cell damage, cell death. May also lead to organ damage and possible failure

Symptoms of Shock

- Symptoms based on organ system affected
- Many common symptoms despite type of shock
  - Brain – decreased mentation
  - Lungs – hypoxia, SOB
  - Integumentary – cool/clammy
  - Renal – decreased u/o
  - Cardiac – tachycardia, decreased output

Types of Shock

1. Hypovolemic
2. Cardiogenic
3. Distributive/Neurogenic – Septic in this category
4. Obstructive

Case Study

- 27 y/o white female
- 7 weeks pregnant, diagnosed with pending miscarriage 2 days prior, passed blood and had syncope at work in the bathroom.

- She is pale, alert, passes out while lying flat, arrives per ambulance with NS bolusing, HR 98, BP 82/65, RR 22, Sa02 95%

Hypovolemic Shock

- Causes
  - Trauma; penetrating, non-penetrating
  - N/V/D
  - GI Bleed
  - Nosebleed
  - Vaginal Bleeding
  - Ectopic pregnancy
  - Aortic dissection
  - Burns

Hypovolemic Shock – Treatment

- 2 large bore IV's, fluid boluses of NS or LR, warmed when possible
- 2 liters for adults…then
- O-neg or crossmatch specific blood
- Pressors if not effective
- Suggest dopamine or norepinephrine
- Stop blood/fluid loss
- Monitor heart rate/rhythm
- Oxygen saturations, respiratory status
- Urine output 0.5ml/hr for adults
- Maintain adequate blood pressure, >90 SBP

Case Study

- 42 y/o female, indigestion past 5 days, has rec'd IVF and IV pepcid at local hospital x2.

- In town for college orientation with daughter, unable to walk across parking lot without SOB, JVD, crackles bilaterally, BP 84/42, HR 112,RR 32 Sa02 86%

Cardiogenic Shock

Causes –

- Acute MI
- Ischemic CAD
- Blunt Trauma
- End-stage cardiomyopathy
- Valvular heart disease
- Myocarditis, endocarditis

Cardiogenic Shock - Treatment

- Increase cardiac output, decrease fluid overload
- Dobutamine Primary Beta Receptors
- Preload reducers, morphine, NTG
- Diuretics
- Airway management
- IABP to help rest heart
- Coronary intervention

Case Study

- 82 y/o female from local NH, has “not been herself” sleeping more, not eating, arrives per ambulance
- Skin warm/dry, temp 96.5, HR 83, BP 76/40
- RR 28, Sa02 90%

Distributive Shock

- Also known as septic shock
- Early recognition is key
- No specific test for sepsis
- WBC, temp up or down, lactic acid

Distributive Shock - Causes

- UTI/pyelonephritis
- Pneumonia
- Infected devices – Foley catheter, ports/lines, peritoneal dialysis
- Cellulitis
- Wounds

Case Study

- 60 year old male
- Roll over
- Partially ejected out the window to waist level
- Intubated
- Bradycardia and hypotension (um um)… what could it be?

Pre-shock or Hypodynamic

- Slight decrease in mentation
- Slight change in temp either up or down
- Slight increase in HR
- Slight decrease or normal BP
- Slight decrease in u/o
- Warm, hot, flushed
- Bounding pulses

Shock – Hypodynamic

- Elevated HR
- Elevated respiratory rate
- Increasing confusion
- Cool and clammy
- Decreased urine output
- Decrease in GI motility
- Elevated liver enzymes
- Acidosis

Treatment – Hypodynamic

- Airway management
- Fluid resuscitation
- Early antibioitcs after cultures
- Removal of infection if caused by catheters, etc
- Monitoring of CVP, SV02

Case Study

- 37 y/o female, traveling highway speeds, unbelted, ejected, unresponsive at the scene

- Intubated, arrives per EMS, HR 133, BP 78/54, bagging, no breath sounds on left

- ET tube re-adjusted, still no breath sounds on left, bilateral NVD, trachea deviated to the right

Obstructive Shock

Caused by outflow obstruction such as:

- Tension pneumothorax
- Pericardial effusion
- Pulmonary embolus

Obstructive Shock – Signs & Symptoms

- Hypotension, Tachycardia, anxiousness
- Types
- Tension pneumothorax
- Pericardial Tamponade

Obstructive Shock - Treatment

- Tension pneumo – needle chest, place chest tube
- Cardiac tamponade – pericardiocentesis/window
- Pulmonary Embolism: S & S hypotension/hypoxia,Tachycardia:
- Treatments anticoagulate, embolectomy, Alteplase

Case Study

- 28 y/o male, unrestrained passenger, 1 vehicle rollover, found hanging partially out of window

- + LOC, c/o upper back pain, abdominal pain

- BP 86/50, HR 58, RR 22, Sa02 98%.

Neurogenic Shock

- Caused by trauma to the spinal cord at the cervical or thoracic level
- Causes loss of sympathetic arterial tone
- Decrease in SVR, BP
- Loss of sympathetic innervation to the heart leaves the parasympathetic system in charge resulting in bradycardia without reflex tachycardia

(Think of a kiddie pool where the sides sag and water sloshes out)

Neurogenic Shock

- Pt's will be pink/warm/dry but hypotensive,bradycardic
- Eliminate all other causes of hypotension before assuming is neurogenic
- Initiate fluid boluses as per usual
- If fluid inadequate, add pressors such as dopamine
- Maintain systolic bp of 85-90 first 7 days after spinal cord injury

Special Considerations

- Geriatrics
- Pediatrics

Special Considerations – Geriatrics

- May not tolerate large amounts of fluids if any heart history
- Will not have response of tachycardia if on beta blockers, may have a PPM
- Decreased ability to tolerate hypovolemia
- Confusion/Alzheimer's will complicate assessments and response to therapies
- Musculoskeletal system much more fragile
- “Poor reserves”

Special Considerations – Pediatrics

- Poor tolerance to hypovolemia
- N/V/D frequently occur
- Difficult to assess change in mental status
- Listen to parents/caregivers
- BP unreliable measurement, use capillary refill
- Oral rehydration often effective if unable to obtain IV site
- Consider sepsis in newborn if temp >100.4 and 4 months or younger

Vasopressor Review

- Sepsis First Line Levophed/Norepinphrine/ 2-20 mcg/min Titrate
- 1-2mcg/min
- Post cardiac arrest: Dopamine or Epinephrine
- Dopamine alpha and beta: Beta up to 10mcg/kg/min/Watch arrhythmias and tachycardia
- Epinephrine all Alpha: 1-20 mcg/min

Vasopressin start **Medication** 0.01-0.04 units/min

Not generally titrated

Not generally weaned

- Typically added to augment effects of other vasoactive agents

Questions?

Questions For You!

How many liters of fluid is recommended as a starting point for a hypovolemic patient?

A. 1
B. 2
C. 3
D. 4

Questions For You!

What is the most important thing to do for sepsis?

A. Recognize sepsis early
B. Put in two large bore IV's
C. Get blood cultures
D. Give the right antibiotic
E. Transfer ASAP if needs advanced care

Questions For You!

What characteristic is exclusive to neurogenic shock?

A. Low blood pressure
B. Tachycardia
C. Warm/dry skin
D. Altered mentation

Questions For You!

What is the treatment for tension penumothorax?

A. Pericardiocentesis
B. Permanent pacemaker
C. Fluids
D. Needle decompression/chest tube

References

- www.uptodate.com
- ENA.org
- Pulmccm.org/critical care
- Emergency Nursing Principles and Practice: 6th Edition - Mosby's