PCCL Session: Summary Report and Resources

PCCL session topic: In A Tight Spot: How We "Aorta" Manage A Sick Baby

Date: October 18th.

Learning objectives:

- Discuss the differential diagnosis of a sick neonate.
- Review resources available to support the care of critically ill children, with specific consideration of rural and remote teams.
- Discuss the resuscitation of an unstable neonate in the context of a likely diagnosis of coarctation.

Case:

An 8-day old female with an uncomplicated prenatal course, normal fetal ultrasound and uncomplicated birth was sent in by their community provider due to an abrupt change in clinical status overnight. On initial assessment in the ER, the infant had increased work of breathing, poor colour and no urine output overnight.

Vitals: Afebrile. HR 170. Sats 80% on RA. RR > 100. Unable to obtain BP*.

CHARLie virtual team was quickly called and IV access was secured. Baby received 2 x 10mls fluid bolus, O2, blood cultures were drawn and IV Ampicillin and Gentamicin given. PICU involved for transport. After initial improvement, clinical status worsened and femoral pulsed were noted to be absent. Infant Transport Team (ITT) supported intubation and management with virtual PICU support.

Learnings:

Differential Diagnosis of a Sick Neonate:

1) Sepsis
2) Cardiac
3) Respiratory
4) Metabolic
5) Endocrine
6) Neurologic
7) Non-Accidental Injury or Trauma

Resuscitation of a neonate with coarctation

- Airway
    - First step is to ensure airway patency and to apply supplemental oxygen
- Breathing
    - Giving early positive end expiratory pressure (PEEP) via anesthetic T-piece, neopuff or CPAP/BIPAP mask is beneficial
- Circulation
    - Obtain IV or IO access- Easier said than done!

  - Cautious fluid administration – 5-10ml/kg of crystalloid with close reassessment after each bolus
- An alprostadil (prostaglandin E1) infusion (0.005-0.1 mcg/kg/min) should be urgently initiated. High doses may be required to open a closed duct
  - Epinephrine infusion may be required (0.05-0.2 mcg/kg/min)

Intubating a Critically ill Neonate in Shock

- Neonates have high oxygen consumption and a closing capacity that exceeds their functional residual capacity, putting them at increased risk of desaturation
- There is significant risk of cardiovascular collapse with the provision of anesthetic agents in the setting of cardiac dysfunction
- Anticipation is key!
- An inotrope infusion should be established prior to induction
  - Epinephrine at a dose of 0.05-0.2 mcg/kg/min
- All resuscitation drugs should be readily available and administered as needed per the PALS algorithms
- Provide induction agents to optimize intubating conditions
- Start with low doses- you can always give more if required!
  - Ketamine 0.25- 0.5mg/kg
  - Rocuronium 1mg/kg
  - Consider having Atropine (20mcg/kg) drawn up and available

An alprostadil (prostaglandin E1) infusion should be available at every site who could care for a neonate. Alprostadil is not a medication which ITT will bring with them.

Resources:

1) Pediatric Critical Care Resources page: Pediatric Critical Care in British Columbia | CHBC (childhealthbc.ca)
   a. SHOCK lecture from Stabilization Essentials in Pediatrics (StEP) course password pcclstep

2) CHARLie (Child Health Advice in Real-time Electronically) - this is a pediatric specific Real-Time Virtual Support.
   a. Free, friendly, specialized pediatric advice available 24/7to providers province wide, with a focus on providing support to rural sides.
   b. Immediately available physician. The team includes pediatricians, pediatric ER physicians and pediatric intensivists.
   c. CHARLie Link

The resources shared throughout this session are for reference purposes only. Please consult your health authority leaders for guidance on adoption and use of these resources within your local context.

The advice provided during the PCCL sessions is not intended to replace the clinical judgment of the healthcare providers who are with the patient. While PCCL sessions may suggest recommendations, the final decisions regarding a child's care and treatment should always rest with the healthcare professionals involved in their care at both the referring and receiving centres.

If you need additional in the moment support refer to the Provincial Real Time Virtual Support Pathways: If you need additional in the moment support refer to the Provincial Pediatric Virtual Support Pathways: https://childhealthbc.ca/pcc/provincial-pediatric-virtual-support-pathways