GUIDELINE

Pulmonary Haemorrhage

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this disclaimer

Aim

Outline the process for diagnosing and investigating a pulmonary haemorrhage along with management and associated conditions.

Risk

Failure to appropriately diagnose and treat a pulmonary haemorrhage can lead to adverse outcomes for the infant.

Background

Pulmonary haemorrhage is a life-threatening complication usually affecting the extremely preterm and those infants born with fetal growth restriction.

For prompt recognition and response to a sudden deterioration, refer to Recognising and Responding to Clinical Deterioration.

Mortality has been estimated at up to 50%. It is a form of fulminant lung oedema with leakage of red cells and capillary filtrate into the lungs. It must be differentiated from occurrence of a small amount of blood being aspirated from the end of an ETT secondary to trauma. It is associated with the conditions below which may cause left ventricular dysfunction.

Associated Clinical Conditions

- Severe birth asphyxia
- Rhesus haemolytic disease with hydrops/near hydrops
- Left heart failure

- Congenital heart disease
- Sepsis
- Hypothermia
- Fluid overload
- Haemostasis failure
- Any pre-existing lung disease will worsen, as protein-rich fluid in the alveoli will inhibit surfactant function.

Clinical Presentation

The commonest clinical presentation is in an infant with severe RDS on IPPV in high oxygen and heart failure secondary to a large pulmonary blood flow from a PDA. It is also associated with surfactant therapy.

Symptoms

- Sudden deterioration. Refer to Recognising and Responding to Clinical Deterioration
- Copious bloody secretions from the infant's airway either up the ETT or from the larynx and mouth if not already intubated.
- Often there is hypotension.
- The infant may be pale and unresponsive.

The outcome is dependent on the cause of the oedema. At the time of collapse, infants are susceptible to neurological damage and GMH/IVH

Investigations

- Check Hb, coagulation screen.
- Check ABG, biochemistry.
- CXR: often shows a white-out.
- Look for sepsis
- Look for evidence of a significant patent ductus arteriosus and pulmonary hypertension.

Management

- Urgently increase mean airway pressure (e.g. high PEEP 6 to 7cm H2O on conventional ventilation) and consider high frequency ventilation with a high mean (e.g. 10 cm H20)
- Maintain blood pressure.

- Correct acidosis by ventilation and/or bicarbonate infusion.
- Fluid balance - consider fluid restriction, administer Frusemide 1-1.5 mg/kg.
- Sedate as needed.
- Surfactant - may help to overcome protein inhibition of endogenous surfactant.
- Consider medical treatment for Patent Ductus Arteriosus (PDA) if neonate not requiring inhaled nitric oxide.
- Suction - be careful as may aggravate bleed.
- Manage coagulopathy.
- Consider antibiotics as sepsis may be associated with sudden circulatory changes.

Related CAHS internal policies, procedures and guidelines

Neonatal Clinical Guidelines

Congenital Heart Disease: Presentation and Initial Management of Duct-Dependent Lesions

Patent Ductus Arteriosus

Recognising and Responding to Clinical Deterioration

Sepsis: Neonatal

Surfactant Therapy

Ventilation High Frequency Oscillatory

Neonatal Medication Monograph

Frusemide

References and related external legislation, policies, and guidelines

1. Ko Sy, Chang YS and Park WS J. Korean. Med. Sci.1998 13:495-499 Massive Pulmonary Hemorrhage in Newborn Infants Successfully treated with High Frequency Oscillatory Ventilation.
2. Alfaleh K, Smyth JA, Roberts RS et al Pediatr. 121:2 2008 e233-e238 Prevention and 18-Month Outcomes of Serious Pulmonary Hemorrhage in Extremely Low Birth Weight Infants: Results From the Trial of Indomethacin Prophylaxis in Preterms.
3. Kluckow M, Evans N. J.Ped 137:1 68-72 Ductal Shunting, High Pulmonary Flow, and Pulmonary Hemorrhage.

This document can be made available in alternative formats on request.

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