Pneumothorax - NICU - Summary Clinical Guideline - Joint UHDB

Reference No: NIC RC 07

Pneumothorax is common in sick infants. Consider pneumothorax in:

- Babies with respiratory distress
- Acute deterioration in a baby receiving positive pressure respiratory support
- Failure to respond to normal resuscitation measures
- Those who have received prolonged resuscitation at birth

At risk groups for pneumothorax:

- Assisted ventilation – CPAP or IPPV particularly if the mean airway pressure is >12
- Breathing out of phase or poor synchronicity with the ventilator
- Underlying lung disease – RDS, congenital malformations and particularly meconium aspiration (all these conditions lead to alveolar over distention and air trapping often made worse by IPPV)
- Risk can be decreased through prophylactic natural surfactant therapy, higher rate conventional ventilation and muscle relaxation.

Presentation of pneumothorax:

- Depending on the size of the pneumothorax as some will be asymptomatic
    - Absent or decreased breath sounds on the affected side
    - Asymmetrical chest expansion
    - Increasing respiratory distress with hypotension
    - Acute desaturation and respiratory acidosis
    - Shifted apex beat
- An acute collapse on the ventilator with one or more of the following:
    - Sudden increase in oxygen requirement
    - Pallor
    - Shock
    - Decrease in HR and BP
- Deterioration in blood gas with respiratory acidosis, hypoxia and hypercarbia.

Diagnosis

Trans-illumination:

A pneumothorax will show up as an area of increased trans-illumination; this is most useful in preterm thin babies. Trans-illumination will often be negative in more mature babies. Care must be taken in interpretation in preterm babies PIE and those with cystic lung disease as this may give a false positive result.

Chest x-ray:

Typically they demonstrate -

- visible visceral pleural edge is seen as a very thin, sharp white line
- no lung markings are seen peripheral to this line
- peripheral space is radiolucent compared to the adjacent lung
- lung may completely collapse
- mediastinum should not shift away from the pneumothorax unless a tension pneumothorax is present (discussed separately)
- subcutaneous emphysema and pneumomediastinum may also be present

Treatment

Depends on severity of pneumothorax and clinical presentation. It could be:

Conservative management:

Usually in non-ventilated infants with non-tension pneumothorax. Needs careful observation in neonatal unit. Do not use high flow or CPAP therapy. Ambient oxygen therapy can assist with spontaneous absorption of resolution of pneumothorax.

Needle aspiration:

May be required in an emergency situation. This is a therapeutic and diagnostic procedure in the critically ill infant. It should only be used when the infant is in extremis as a more definitive management (chest drain) will be required.

Intrapleural chest drain - Seldinger Technique:

Usually, the definitive procedure in babies with symptomatic pneumothorax.

Please refer to the full guidelines for detailed information - NIC RC 07