GUIDELINES FOR THE USE OF SURFACTANT

Introduction

- surfactant is expensive, however evidence for its effectiveness is very strong

A systematic review of 35 RCTs on surfactant use: in 6000 infants there was a reduction in mortality of 30-40%, a reduction in pulmonary air leak, and decreased long term oxygen dependence.

Indication

Ideally for all infants who require mechanical ventilation for respiratory distress syndrome (RDS), which is due to surfactant deficiency. Due to costs, this is limited to:

- preterm infants ≤ 32 weeks or birth weight ≤ 1.5 kg
- more mature or larger infants if RDS is severe
  i.e. arterial alveolar (a/A) PO_2 ratio of <0.22 or Fraction of inspired oxygen (FiO_2) > 0.5

Calculation for a/A PO_2 ratio : $\frac{PaO_2 \text{ (mmHg)}}{(760-47)FiO_2 - PaCO_2 \text{ (mmHg)}}$

Timing of therapy

- give first dose as early as possible to preterm infants on mechanical ventilation
- no benefit in administering surfactant > 24 hours age or using more than 2 doses

Types of surfactant and dosage

- *Survanta*, a natural surfactant, is the only preparation currently available in Malaysia.
  - dose : 4 ml/kg per dose. Give 1st dose as soon as possible preferably in first 2 hours.
  - repeat at 6 hours later if needed. Onset of action within minutes.

Method of administration

- surfactant is delivered as a bolus directly through an endotracheal tube (ETT), over 15 minutes, either via
  - a catheter inserted into the ETT via a side port in the ventilator circuit , in 2 aliquots
  - on the ETT adaptor without the need of removing the infant from ventilator
  - into the side port on the ETT adaptor
- rapid installation over 5 minutes is not recommended as it results in an increase in CBFV (Cerebral Blood Flow Velocity) and PCO_2 compared to slower 15-minute bolus
- infants who remained connected to the ventilator during surfactant installation have been shown to experience less oxygen desaturation compared to those who were disconnected. This also results in more homogenous distribution of surfactant within the lung
- infants must be monitored closely with a pulse oximeter and regular blood gas m measurements. An indwelling intra-arterial line will be useful. Ventilator settings must be promptly wound down to reduce the risk of pneumothorax.
- a single dose may be sufficient if after dosing, the oxygen requirement falls < 30%.

Cost effectiveness

- studies on the cost-effectiveness of surfactant therapy show that in spite of the high cost of drug, its use reduces cost per survivor.