Guideline for the Care of a Paralysed Infant

Rationale

Ventilated newborn infants breathing in asynchrony with the ventilator are at risk of complications during mechanical ventilation, such as pneumothorax or intraventricular haemorrhage. Neuromuscular paralysis with pancuronium seems to have a favourable effect preventing these complications. Neuromuscular blocking agents may also be used to facilitate in High Frequency Oscillatory Ventilation (Blanchard, 2002). However, it has not been shown to reduce oxygen consumption (Russel et al., 2002).

Uncertainty remains regarding the long term pulmonary and neurologic effects, and regarding the safety of prolonged use of pancuronium in ventilated newborn infants. There is no evidence from randomized trials on the effects of neuromuscular blocking agents other than pancuronium. (Cools and Offringa, 2005).

The use of muscle relaxants is mainly in cases of

1. Severe acute respiratory syndrome requiring inverse-ratio ventilation or permissive hypercapnia.
2. Severe respiratory failure requiring improved chest wall compliance.
3. Need for immobility (following some types of surgery).
   (Blanchard, 2002)

Neuromuscular blocking agents should only be used when sedation and analgesia have failed; they should never be used without concurrent sedation and analgesia (Blanchard, 2002).
**Practice**

**Suctioning**

Need for suctioning must be assessed frequently as a paralysed infant has no cough reflex. See guideline for endotracheal suctioning.

**Skin Care**

Paralysing prevents any spontaneous movement, which increases the potential for pressure injuries. Often infants have other factors such as hypovolaemia, hypotension and extreme prematurity, which in turn, increase likelihood of pressure damage. 4-6 hourly position changes and approximately 12 hourly changes from one side to the other help prevent pressure damage. Damage first appears as red areas that don’t blanch when pressed (Willock 2005). The areas most at risk are the lobes of the ears, especially if the hat is too small, and the back of the head. The use of gel mattress should also be considered.

Paralysed infants are prone to becoming oedematous, and therefore probe sites need to be changed 2 hourly to prevent pressure damage. Also sites of splints need to be observed closely.

Bladder may need to be manipulated gently if the urine output diminishes, even though paralysing agents do not affect the smooth muscles.

**Eye Care**

The combination of the poor closure of the eyelid and a lack of corneal reflex can lead to exposure of the cornea, placing it at risk of drying, infection, scarring and subsequent visual loss (Lenart and Garrity, 2000). Application of an artificial tear solution (Liquifilm Tears®) every 4 hours is required to prevent this.
Positioning

Natural flexion of joints and limbs should be supported using rolled blankets and sheets. Consider consulting physiotherapists and performing passive exercises every 4 hours if paralyzed state is maintained continuously for more than 24 hours.

Pain control

The only sign of insufficient analgesia in a paralysed infant may be an increase in blood pressure and heart rate. Pain scoring system cannot therefore be used.

Medication

1. **Pancuronium** has a very rapid onset of action within 30 seconds and the duration of action is approximately 90-100 minutes. It is suitable for bolus dosing but not for constant infusion. Pancuronium is mainly excreted through the kidneys. Tachycardia and hypertension are the major side effects. Resistance to paralytic effect may occur with prolonged use.

2. **Vecuronium** has an onset of action of two to three minutes and the duration of action is 30 to 45 minutes, which is why it is used as an infusion. Vecuronium is also 50% renally excreted and has an active metabolite which accumulates in patients with renal failure. Infusion should be stopped once every 24 to 48 hours, when possible, to reassess the continuing need for paralysis.

3. **Midazolam** has a rapid onset and short elimination half-life. Accumulation may occur in renal and hepatic failure. Recovery time is proportional to the infusions duration.

Some medications enhance an induced neuromuscular blockade. These include aminoglycosides, high-dose furosemide and beta-agonists (eg. Salbutamol).
References


