

Respiratory Complications in Ex-Premature Children

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Survival rates for premature neonates born at less than 30 weeks gestational age have significantly improved in the past 15 years due to advanced ventilation techniques, the early use of steroids and exogenous surfactant. Common amongst this population of children, however, is impaired respiratory function for many years after birth. Causes of this dysfunction include lung under-development, recurrent infections or aspiration and broncho-pulmonary dysplasia (BPD). Up to 20% of neonates requiring prolonged ventilation progress to chronic lung disease ⁽¹⁾.

Children with BPD may have several problems due to increased pulmonary fibrosis: increased airway resistance, decreased lung compliance and volumes, diminished functional residual capacity, airways obstruction, hyperinflation and even pulmonary hypertension. These children often wheeze with infection and may require oxygen post operatively. Pulmonary abnormalities in ex-premature infants are most evident in the first three years of life but often persist until age eight or nine ⁽²⁾. At least one other study has shown dysfunction beyond age eleven ⁽³⁾. These children have a higher oxygen consumption with stress, exercise and anaesthesia.

Ex-premature children have a high incidence of co-existing disease such as neurological problems and developmental disability, often associated with central sleep apnoea. These ex-premature children are more sensitive to sedatives and are at risk of apnoea post operatively.

Other common associations in these children are gastro-oesophageal reflux and aspiration. Children in the first three years of life with these conditions are often relatively asymptomatic and present for routine surgery such as tonsillectomy. It is during these procedures that they are at increased risk of perioperative bronchospasm and hypoxaemia due to their subtle decreases in lung volumes and airway reactivity.

Added to the complications of BPD are the risks of airways obstruction due to subglottic stenosis and obstructive sleep apnoea. Subglottic stenosis is a common association of prolonged intubation as a neonate and can be relatively asymptomatic for the unsuspecting anaesthetist. Indeed, several case reports of subglottic cysts have been reported in these children ⁽⁴⁾. Altered head shape, involving the hypopharynx, due to long term positioning with the head to the side and poor sucking etc. predisposes to airways obstruction. Ex-premature children are often, therefore, at a higher risk of obstructive sleep apnoea and potentially even more sensitive to sedative medication.

References:

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4. Smith et al. Arch Otolaryngol Head Neck Surg. 120(9):921-4, 1994