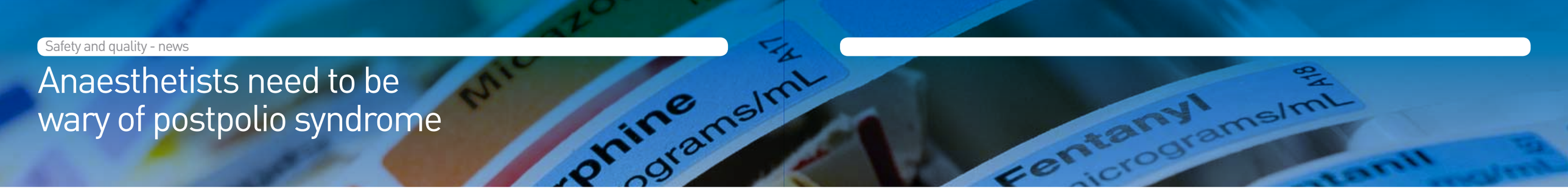

Anaesthetists need to be wary of postpolio syndrome

Postpolio syndrome (PPS) occurs in a significant proportion of polio survivors years after recovering from the original illness[1,2].

Anaesthetists need to be aware of the syndrome as polio survivors are relatively numerous (40,000 cases of paralytic polio in Australia from the 1930s to the 1960s), they are of an age where they will be increasingly presenting for elective and emergency procedures and the syndrome has important implications for the planning and delivery of anaesthesia[3,4].

Poliomyelitis results from an enteroviral infection that damages anterior horn cells in the spinal cord and results in flaccid paralysis with slow improvement over months or years. It may also be associated with encephalitic changes affecting the brainstem nuclei particularly in the medulla, the cerebellum and the reticular formation and as a result may cause bulbar and autonomic dysfunction as well as alterations in mental state[5].

PPS typically occurs 20 to 40 years after the acute poliomyelitis episode[5]. Although the exact mechanisms of the PPS are debated[1,3,5], neurological dysfunction worsens or recurs in areas affected during the original illness.

This is most commonly manifested as progressive muscle weakness, fatigue or pain in the muscles and joints. However respiratory failure, sleep disordered breathing and bulbar dysfunction with dsyphonia, dysphagia or poor cough may also occur[1,3]. Cold intolerance is also common[3,6].

Preoperative assessment in PPS patients should define the nature of the initial poliomyelitis episode including areas affected, severity and current functional capacity. A history of polio requiring mechanical ventilation, with bulbar dysfunction or resulting in kyphoscoliosis should prompt a detailed respiratory assessment and consideration of formal lung function testing and blood gas assessment as such patients are at highest risk for postoperative respiratory complications[3].

However, even patients who did not require ventilation during the initial illness may progress to respiratory failure after many years[2]. Detailed questioning regarding symptoms of sleep apnoea and nocturnal hypoventilation such as morning headache, daytime somnolence and fatigue is also appropriate and should prompt investigation when present[1]. Without specific questioning PPS patients who are high risk for perioperative respiratory failure may be missed[2,7,8].

Patients with PPS are generally considered to have increased sensitivity to opiates, muscle relaxants, sedative and anaesthetic drugs leading to recommendations to start low and titrate carefully[3,6,9]. This is probably multifactorial reflecting changes in the reticular activating system, muscle atrophy and weakness due to denervation and reduced volume of distribution due to muscle loss.

In relation to muscle relaxants, PPS patients are said to be twice as sensitive to non-depolarising muscle relaxants with a recommendation to use a short-acting agent, starting with half the usual dose and carefully titrating therapy with neuromuscular monitoring against a baseline twitch response[3,10].

Avoidance of suxamethonium where possible is recommended as it may result in greater post-operative muscle pain[9] and concerns remain regarding the risk of hyperkalaemia although evidence is lacking[3,11]. Regional anaesthesia has been successfully used[3,4,12] and where feasible may result in fewer complications although delayed muscle recovery may occur[4,6].

Other intraoperative factors to consider are patient positioning which may be difficult due to contractures, a high fracture risk from associated osteoporosis and increased risk of nerve injury due to abnormal muscles and tendons[3,4,6].

Awake positioning prior to surgery may minimise these risks. Attention to warming introperatively is important to prevent hypothermia and distressing post-operative shivering due to abnormal thermoregulation[3,4,6].

Postoperative respiratory failure related to oversedation and weakness has been reported[7] and consideration should be given to increased post-operative monitoring in an HDU environment[3,4,8]. Slow emergence and respiratory concerns will preclude day surgery for the majority[4,6]. Pain management may be difficult both due the presence of chronic pain and concerns relating increased sensitivity to the sedative and respiratory depressant effects of analgesics[3,9].

Postpolio syndrome patients present a number of potential problems for the anaesthetist. However for those who are aware of the syndrome, careful assessment and planning should minimise the risk of perioperative complications and provide optimal patient outcomes.

Dr Anthony Tobin, FCICM
Deputy Director, Intensive Care Unit,
St Vincent's Hospital, Victoria

References:

1. Gonzalez H, Olsson T, Borg K. Management of postpolio syndrome. The Lancet Neurology 2010;9:634-42.
2. Howard RS, Wiles CM, Spencer GT. The late sequelae of poliomyelitis. The Quarterly journal of medicine 1988;66:219-32.
3. Lambert DA, Giannouli E, Schmidt BJ. Postpolio syndrome and anesthesia. Anesthesiology 2005;103:638-44.
4. Schwartz A, Bosch LM. Anesthetic implications of postpolio syndrome: new concerns for an old disease. AANA journal 2012;80:356-61.
5. Kidd D, Williams AJ, Howard RS. Poliomyelitis. Postgraduate medical journal 1996;72:641-7.
6. Bruno, RL. Preventing complications in polio survivors undergoing surgery. Harvest Press, 2002. (Accessed 30 June 2015, at http://www.postpolioinfo.com/lib_surgical.php.)
7. Magi E, Recine C, Klockenbusch B, Cascianini EA. A postoperative respiratory arrest in a post poliomyelitis patient. Anaesthesia 2003;58:98-9.
8. Spencer GT, Reynolds F. Postoperative respiratory arrest in a post poliomyelitis patient. Anaesthesia 2003;58:609-10- author reply 10.
9. Calmes, SH. Summary of Anesthesia Issues for the Post-Polio Patient. (Accessed 30 June, 2015, at http://www.post-polio.org/edu/hpros/sum-anes.html)
10. Gyermek L. Increased potency of nondepolarizing relaxants after poliomyelitis. Journal of clinical pharmacology 1990;30:170-3.
11. Connelly NR, Abbott TC. Successful use of succinylcholine for cesarean delivery in a patient with postpolio syndrome. Anesthesiology 2008;108:1151-2- author reply 2-3.
12. Rezende DP RM, Costa VV, Arci EC, Saraiva RA. Patients with Sequelae of Poliomyelitis. Does the AnestheticTechnique Impose Risks. Revista Brasileira de Anestesiologia 2008;58:210-9.

Further information can be found at
www.postpoliovictoria.org.au/category/resources/