Anesthetic considerations in periventricular leucomalacia

Sir,

Periventricular leucomalacia (PVL) is a form of brain injury characterized by the death of white matter near the cerebral ventricles due to damage and softening of brain tissue. This may occur antenatally or postnatally. Premature infants are at the greatest risk of disorder with reported incidence of 4-10%. [1] Affected children generally exhibit motor control problems, intellectual or learning difficulties and other developmental delays. They often develop cerebral palsy or epilepsy later in life. PVL may manifest immediately or after few months in postnatal period. Each baby experiences symptoms differently. Other most frequently found signs include: Vision defects, apnea, and low heart rate. Even full-term infants born with congenital heart diseases have a strikingly high incidence of white matter injury.[2]

An 8.8 kg, 2 years 9-month female child with a suspected diagnosis of Hirschsprung's disease was scheduled for diagnostic rectal biopsy. The child was full-term normal vaginal delivery with no history of birth asphyxia or birth trauma, and was asymptomatic at birth. She developed myoclonic seizures at six months of age. Patient had delayed milestones i.e., head holding was not there and she was not able to walk or sit properly without support. Child had generalized hypotonia. MRI was suggestive of PVL. She was on sodium valproate 40 mg/kg/day orally since 6 months of age. Last seizure episode reported was 15 days back.

Child was conscious, oriented but not able to support on her own. Her pulse rate was 88/min, blood pressure 83/50 mmHg and was afebrile. Respiratory and cardiovascular examinations were normal. Patient was advised to take her morning dose of antiepileptic drug. In the operation theatre, monitoring of ECG, S_pO_2 and NIBP was started. Anesthesia was induced with sevoflurane in 100% O_2, in graded concentrations of 1-3%. Child was obtunded with just 3% sevoflurane in one and a half minute. After securing IV cannulation with 24 G cannula, patient was administered glycopyrrolate 0.1 mg and fentanyl 10 μg intravenous. As these patients can have associated cerebral palsy, aspiration prophylaxis with ranitidine 10 mg and metoclopramide 1.5 mg intravenous was administered. Airway was secured using PLMA size 2 and patient was kept on spontaneous ventilation. Diclofenac 10 mg was given intramuscular for postoperative pain relief. She remained hemodynamically stable throughout the surgery, which lasted for 25 minutes. Her postoperative period was uneventful.

PVL is a multifactorial disease caused by ischemia, oxidant injury and inflammation. All attempts should be made to minimize hypotension, hypocarbia and hyperventilation in the periopertive period and prevent further aggravation of injury in these patients.[3] We avoided use of muscle relaxant because of pre-existing hypotonia and the anticipated duration of surgery was short. Regional anesthesia (caudal block) was avoided because of the risk of worsening neurological outcome secondary to mechanical trauma, local anesthetic toxicity or neural ischemia.[4] Progressive neurological disease has been considered to be a relative contraindication to regional anesthesia by some authors.[5] Undiagnosed PVL could lead to poor surgical outcome after an appropriate procedure.[6]

Available data and recommendations on the perioperative management of patient with PVL are limited. We wish to share our experience of this condition in view of paucity of literature. Anesthetists should consider the possibility of PVL in a child with or without delayed milestones planned for surgery.

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Quick Response Code:	Website: www.joacp.org
	DOI: 10.4103/0970-9185.83713