

## **Dexmedetomidine in patient with cerebral palsy—Changing anesthesia practice**

Dear Editor,

Children with CP have multiple systemic involvements and significant cognitive impairment that make their anesthetic management challenging. A comprehensive understanding of the pathophysiology and severity of disease help the anesthesiologists to prepare for a better perioperative outcome.

Our patient was a 6-year-old boy, weighing 20 kg, a known case of quadriplegic CP with bilateral adductor hip contracture, seizure disorder, microcephaly, hearing and visual impairment posted for bilateral adductor tenotomy. He had

difficulty in swallowing with a positive history of snoring during sleep. Standard inhalation induction was done with 2–6% sevoflurane following premedication and the airway was secured with an appropriate sized endotracheal tube. The caudal epidural block was administered with 0.5 mL/kg of 0.25% bupivacaine and dexmedetomidine infusion was started at 0.4–0.6  $\mu\text{g}/\text{kg}/\text{h}$  infusion titrated to maintain a bispectral index (BIS) value in the range of 40–60 with sevoflurane maintained at 1% throughout the procedure. Dexmedetomidine infusion was continued until the end of the surgery. The reversal was smooth and the patient was awake, pain-free, calm, and comfortable in the postoperative period.

Children with CP often have bulbar and pseudobulbar muscles spasms and esophageal dysmotility resulting in feeding difficulties, higher risk of respiratory infections and micro aspirations.<sup>[1]</sup> Two-thirds of them have behavioral

abnormalities, intellectual disabilities, and speech problems making them more emotionally labile.<sup>[1]</sup> Thus, while an effective premedication is desirable, sedatives hypnotics should be used cautiously due to higher sensitivity and greater risk of respiratory depression.<sup>[1]</sup> They have resistance to nondepolarizing muscle relaxants (NDMRs) and reduced minimum alveolar concentration (MAC) requirement values for inhalational agents which contributes to delayed emergence. Inadequate analgesia can precipitate spasms in the postoperative period, necessitating effective perioperative analgesia. This implies that a child with CP requires a higher dose of NDMRs, has a greater sensitivity to inhalation agents, opioids—hypnotics, a tendency of delayed emergence and risk of postoperative respiratory depression with the use of conventional anesthesia technique.

Dexmedetomidine, a selective alpha 2 receptor agonist offers analgesic, hypnotic, sedative, and sympatholytic properties. It has been used successfully for sedation in diagnostic units, ICU, as an adjunct to general anesthesia in adults and in pediatric patients as well.<sup>[2,3]</sup> It reduces the MAC requirement of inhaled anesthetics, provides effective analgesia with smooth emergence, has no effect on arterial oxygenation, the slope of the CO<sub>2</sub> ventilatory response curve and offers an opioid-sparing effect making its use suitable for these patients.<sup>[2]</sup> However, literature regarding its use in patients with CP is limited.<sup>[4,5]</sup> With the concern of anesthesia-induced developmental neurotoxicities in children, the use of dexmedetomidine owing to its neuroprotective effects especially in this subgroup becomes even more advantageous and valuable.<sup>[3]</sup>

Owing to limited experience with dexmedetomidine in a patient with CP, we preferred a low dose of dexmedetomidine infusion over bolus. We titrated the dose and found 0.4 µg/kg/h to be effective to maintain a BIS of 40–60 with 1% sevoflurane.

Dexmedetomidine in CP offers unique advantages by reducing inhalational and intravenous drug requirements, providing stable intraoperative hemodynamics, a neuroprotective effect and a rapid and smooth emergence and can be a revolutionary change in the practice of anesthesia for CP children. However, it needs more evidence for making it a routine use in our practice.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published

and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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### Conflicts of interest

There are no conflicts of interest.

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