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Letter to Editor

Cerebral palsy: Encounter to unforeseen state of affairs

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Cerebral palsy is a broad spectrum of permanent neurodevelopmental disorders that involves muscle tone, motor functions, movement and posture. Besides these several other comorbidities have been seen associated with it i.e. pain, intellectual disability, inability to walk, hip displacement, inability to speak, epilepsy, incontinence and behavioural or sleep disorders.[1] We may encounter patients with cerebral palsy now and then for a range of surgical procedures. In order to provide remarkable anaesthetic care thorough knowledge of multiorgan involvement in cerebral palsy should be there.

This is a case of 15 years old male with spastic quadriplegic cerebral palsy with GMFCS (Gross Motor Function Classification System) level V having open sub-trochanteric left femur fracture and posted for debridement and external fixator application. All routine investigations were within normal limits with no associated co-morbidities. The child was taken inside operating room, standard monitors attached and baseline reading taken. The patient received injection Midazolam and injection Glycopyrrolate as premedication according to weight. Then injection Fentanyl @ 2 mic/kg IV was given and induction was planned with injection Propofol @ 1-2 mg/kg. However, the patient required up to 80 mg of propofol i.e. approximately 4 mg/kg. Muscle relaxation was achieved with injection Atracurium @ 0.5mg/kg in order to achieve tracheal intubation for controlled mechanical ventilation. Patient also received injection Dexamethasone @ 0.1 mg/kg, Paracetamol @ 15mg/kg and Ondansetron @ 0.1 mg/kg IV. Patient required noradrenaline infusion @ 0.02 mic/kg/min intraoperative in order to maintain mean blood pressure between 60-65 mmHg despite adequate volume status and insignificant blood loss. Initially, the child was coming out of the effect of muscle relaxation every half hour but later, this duration came down to 6-10 minutes. Patient was extubated uneventfully. As proper immobilisation could not be maintained in the ward in the postoperative period pertaining to continuous limb movement in the child may be due to irritability, the operated femur broke again, for which the patient underwent redo surgery two days later. The only difference in the anaesthetic management in the second surgery was that this time injection Vecuronium @0.1 mg/kg IV was used for muscle relaxation. A maintenance dose of injection Vecuronium was given every half hour or on wearing off the effect of muscle relaxation and not before that, nor did the patient require it any time earlier. The patient also did not require noradrenaline infusion in the second surgery.

It has been recently found that the hypertonicity of the muscles is because of three causes, first, more muscle fibres are required to perform a certain task than in healthy individuals, secondly, excessive level of collagen deposition in myofibers decreases the efficiency of the muscle by making them stiff and lastly, disturbance in the neuromuscular junction causes a problem in muscle contraction.[2] They also revealed that collagen accumulation

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Table 1: Anaesthetic challenges, implications and management

Intellectual disability with vision and hearing impairment	Difficulty in communication and pain assessment
Anxiety	Irritability and development of seizure
Thin body habitus with little subcutaneous fat	Difficulty in securing intravenous access and increase susceptibility to hypothermia
Chronic contractures, spasticity and dehydration	Difficulty in placing non-invasive or invasive monitors or performing any regional technique
Difficult laryngoscopy	Abnormal dentition, temporomandibular joint dysfunction and positioning difficulties
Pooled saliva, inability to cough and swallow	Overproduction of salivary glands, tongue thrusting and impaired cranial nerve function due to pseudo bulbar palsy; managed by anti-sialogogues and anti-reflux agents along with suctioning
Chronic aspiration risk leading to recurrent pneumonia and reactive airway disease	Decreased lower oesophageal sphincter tone
Malnourished with weak immune system	Prone to infections
Proper positioning and padding	Prevent joint dislocation and pressure sores
Chronic respiratory system involvement	Pulmonary hypertension or cor pulmonale

occurs due to damage to the central nervous system in the developing brain and it further causes issues in the motor abilities of the child.

Neuromuscular blockers are not contraindicated, but they show relative resistance to non-depolarising agents such as Vecuronium due to up-regulation of extra-junctional acetylcholine receptors or the interaction of neuromuscular blockers with the anticonvulsant drug if any or because of chronic immobilisation.[3–5] The Minimum Alveolar Concentration of the inhalational agents also gets reduced by 20% in patients with cerebral palsy and a further 10% lower in patients on anticonvulsants.[6] Hypotension can be seen due to anaesthetic agents or decreased central adrenergic response.

Literature has detailed descriptions of cerebral palsy. However, this is to bring to the notice that even after thorough knowledge patients might respond differently. In our case, during first surgery patient stopped responding to non-depolarising muscle relaxant, where in second one this was not the case.

The anaesthesiologist must have a full awareness of how this spectrum of illnesses impacts the physiology of various organ systems in order to create a safe and efficient anaesthetic plan for patients with cerebral palsy.

It can be concluded that anaesthesiologists face unique challenges while treating patients with cerebral palsy. A thorough grasp of the aetiology, pathophysiology, and clinical consequences of this group of illnesses is necessary for effective perioperative care

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