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ANAESTHETIC MANAGEMENT OF PAEDIATRIC PATIENT WITH CEREBRAL PALSY POSTED FOR LOWER LIMB ORTHOPAEDIC SURGERY

Anaesthesiology

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KEYWORDS

INTRODUCTION

Cerebral palsy (CP) refers to spectrum of nonprogressive neurological disorders of motor development.

It is associated with cognitive and neurosensory disturbances. The degree of disability in CP depends on the area of brain affected. Involvement of motor cortex leads to spasticity. Spasticity can lead to contracture spine deformities and chronic pain.[1]

In CP along with neurological symptoms, gastroesophageal reflux is common which leads to risk of aspiration. Increased salivation is due to overactive salivary glands, dysphagia and poor head controls adds up to the possible hazards of aspiration.[1] Patients are prone for recurrent pneumonia from chronic aspiration and they lack ability to cough effectively.[2] Neuromuscular scoliosis may develop overtime; this can result in extrinsic restrictive lung physiology with subsequent hypoxia, pulmonary hypertension (In severe cases). Children with CP often have poor nutritional status resulting in dehydration,anemia and electrolyte imbalances that may require optimisation before surgery.[3]

Thus, anaesthesia providers to these patients should be well versed with aetiology, pathophysiology and management of CP for smooth and safe conduct of anaesthetic course.

Case Report

A 17yr old male, a known case of cerebral palsy with mental retardation and seizure disorder presented with complaints of swelling over the right mid-thigh since 14days (informant- father). Patient informant gives history of slip and fall from bed at his residence following which patient developed swelling over right mid-thigh and patient taken to hospital for further management, where patient was diagnosed with fracture and was managed conservatively with Thomas splint. Following which patient again had swelling and bleeding over right distal thigh. Patient was again brought to hospital for further management. He is a known case of seizure disorder(on sodium valproate). He was born via preterm caesarean section with history of NICU Admission for 15days.

On examination patient is conscious, not oriented, not obeying commands. On Airway examination mouth opening two finger breadth, no cleft lip and palate and Mallampatti grade 4. On spine examination showed gross thoracolumbar scoliosis. Cardiac and respiratory examination were normal. He is planned for bone excision and wound debridement and ORIF with TENS/K-wire fixation under spinal anesthesia with femoral block.

A multidisciplinary approach involving paediatrician and orthopaedic surgeon was considered immediately. A written, informed and valid consent was obtained from the parents. Gentle and sympathetic approach was made in explaining the risk-benefit ratio of surgery and proper counselling of the parents regarding anaesthesia.

In view of anticipate d difficult airway, procedure was planned for surgery under spinal anesthesia with femoral block.

After taking patient inside the OT, Standard non-invasive monitors were attached and baseline vital parameters were noted. Patient was placed in lateral decubitus position. Under aseptic precautions parts were painted and draped. Under USG guidance with low frequency curvilinear probe, L3-L4 intervertebral space was identified. Subarachnoid block given using 25G Quincke's needle with Inj. Levobupivacaine 0.5% (H) 1.5cc. Using high frequency linear ultrasound transducer, femoral nerve was identified and block was given with 10ml of Inj. Ropivacaine 0.5%. Adequate analgesia was achieved. Surgery lasted for 1.5 hours & patient tolerated the procedure well.

DISCUSSION

Individuals with CP are more likely to experience perioperative complications from the surgery or anesthesia. Propofol is preferred for the induction of general anesthesia in CP patients. Because Ach receptors are upregulated and have a shorter duration of action, resistance to non-depolarizing muscle relaxants is anticipated.[4] Potassium levels can rise due to succinylcholine.[5]

Pooled secretions in the oropharynx affect mask and bag ventilation as well as the glottis view during laryngoscopy. Consequently, frequent suctioning could be required. Because of the danger of aspiration, microcephaly, and difficult airways, airway manipulation is avoided. However, since these patients are at risk for gastric reflux disease, rapid sequence induction (RSI) may be explored. Due to contractures and stiffness, the patient may be difficult to position during and after intubation.[6]

These patients have been shown to have increased susceptibility to drugs. Constipation is common in CP sufferers. Therefore, opioids can exacerbate this issue in any way. Because it reduces the threshold for seizures, tramadol is avoided.[7] Steer clear of other epileptogenic medications such etomidate, methohexital, and ketamine. The long-term use of anticonvulsants lowers MAC for these patients.[8] Therefore, in order to prevent an excessive depth of anesthesia, volatile medications should be titrated appropriately.

In these patients, hypothermia is a prevalent and critical problem. It arises from abnormal thermoregulatory responses due to hypothalamic dysfunction, lack of insulation with muscle/fat, and malnourishment. Temperature monitoring must be done extremely carefully since peri-operative hypothermia might have major negative effects. Warming blankets and IV fluid warmers are examples of temperature-saving measures.

Because they are simpler to administer and offer both intraoperative and postoperative pain treatment, regional anesthesia techniques—particularly SAB—are recommended, which lowers the need for polypharmacy. A high success rate is ensured by the quick start of action and the distribution of sensory and motor blockage. Compared to general anesthesia, which entails airway manipulation and the administration of numerous medications, the recovery process is quicker and more seamless.

Plan of anaesthesia for Cerebral palsy patients should be tailored to

each case as both regional and general anaesthesia poses various challenges. Regional anesthesia provides good intraoperative and postoperative analgesia, reduces polypharmacy and rapid onset of action with smooth recovery. However, anatomical variations especially kyphoscoliosis, contractures and spasticity, poor communication and cognitive skills makes it difficult to administer regional anaesthesia and to assess the adequacy of block. Anticipated difficult airway, risk of aspiration, increased sensitivity to some anaesthetic drugs, pooling of secretions are some of concerns to be kept in mind while administering general anaesthesia.

CONCLUSION

Clinical description of cerebral palsy encompasses varied spectrum of presentations and requires optimal anaesthetic management despite the unusual challenges in order to ensure patient safety and satisfaction. Thorough preoperative evaluation, meticulous intraoperative plan of anaesthesia and postoperative analgesia are of utmost importance.

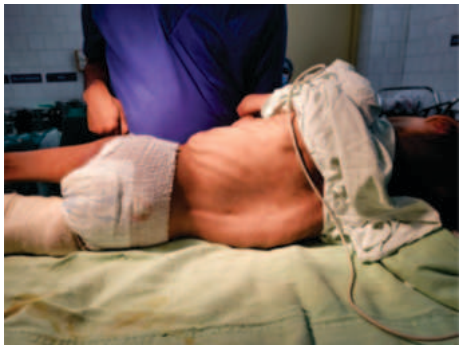

Fig. 1: Showing Kyphoscoliosis in Lateral Position

Fig. 2: Showing Difficult Airway With Mallampati 4 With Restricted Neck Movements

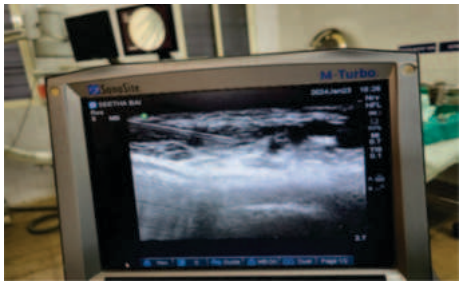

Fig. 3: Depicting USG Guided Femoral Block

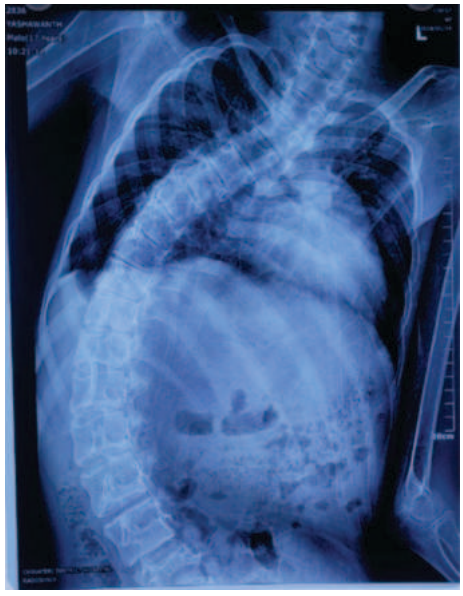

Fig. 4: Chest X-ray Showing Kyphoscoliosis

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