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LETTER TO THE EDITOR

Anaesthetic Challenges in a Paediatric Case of Cerebral Palsy

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Cerebral Palsy (CP), a non-progressive central motor disorder is characterized by deformities which are progressive and often merit corrective surgeries to limit these deformities for proper rehabilitation of the patient. Anaesthesia in such patients is challenging due to disabilities and altered pharmacokinetics of different drugs. Specific concerns include intraoperative hypothermia, slow emergence, increased risks of aspiration due to excessive Oro-pharyngeal secretions and gastro-esophageal reflux, recurrent Pneumonia, history of seizures and anti-seizure medications, respiratory depression, and post-operative pain and muscle spasms.

We describe the anesthetic management of a five-year-male with spastic CP, who underwent corrective surgery for bilateral Congenital Telipes Equino varus (CTEV) and deformities in lower limb and emphasize upon these risks and their management. This case presented to the pediatric outpatients' clinic as a diagnosed case of spastic cerebral palsy with seizures and bilateral congenital telipes equino varus (CTEV) and lower limb deformity. He also had a past history of recurrent pneumonia for which he received treatment in the pediatric medicine department. Child had been on Valproate for seizures, Baclofen for muscle spasms and Ranitidine for gastro-esophageal reflux disease (GERD). Surgery had been cancelled several times in the past due to the poor general condition of the child and the high risk involved.

On examination, this patient weighed 15 KG and was pale, anicteric and tachycardic with a blood pressure of 96/64 mm Hg. He had delayed developmental milestones including language, social and mental milestones. Airway was normal with Mallampatti grade -1 on examination. Excessive oral and pharyngeal secretions were present and occasional drooling of saliva was noticed. There was also the presence of gastro-esophageal reflux. Patient had obvious Kypho-scoliosis and spinal deformity. He had bilateral CTEV with several contractures. Increased muscle tone, tense contracted muscles and exaggerated deep tendon reflexes were other significant findings. Examination of the respiratory system revealed bilateral equal air entry but there was crepitation in the right middle

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chest. Cardiovascular system was normal on examination. Routine blood investigations showed hemoglobin of 9.0gm/dl and total leucocyte count of 8700. Chest X-ray did not reveal any obvious pneumonic consolidation.

Child was taken for surgery after optimizing his medical condition and counseling the parents about the risks of anesthesia and surgery. Morning dose of Baclofen and Valproate were given as before on the day of surgery, and injections Atropine, Fentanyl (1µg/kg) and Ondansetron were instituted before induction with inhalational Isoflurane. Injection Succinylcholine (0.5mg) was given to achieve relaxation for intubation with 2.5mm laryngeal mask airway (LMA) following which bilateral equal air entry was confirmed and suction done to aspirate secretions. Maintenance was done with Oxygen, Isoflurane (0.5 MAC) and Propofol infusion. Injection Lorazepam was used to control intra-operative seizures; Injection Dexamethasone was also instituted. The intra-operative course was stable except the occurrence of one episode of seizure and there was smooth emergence. Pain-free postoperative course was ensured by giving Oxycodone at 0.05 mg/KG body weight.

Anesthesia in spastic CP patients is challenging due to the presence of complex comorbidities, risks of hypothermia, aspiration, reactive airways, potentially difficult airways, and chronic Musculo-skeletal conditions like spasticity.[1-3] Micrognathia, scoliosis, limited neck extension, temporo-mandibular stiffness, poor dentition, and increased airway secretions make the airway vulnerable.[2,4] Restricted lung disease due to spinal abnormalities, poor chest compliance, weak cough reflex, recurrent chest infections, and increased risks of aspiration due to gastro-esophageal reflux are the respiratory issues of anesthetic concerns in CP patients.[2,3,5] Chronic hypoxemia may be the cause for pulmonary hypertension or Cor pulmonale. Seizure disorders and drug interactions due to antiseizure medications are of prime concern when managing these patients.[3] Gastro-esophageal reflux, delayed gastric emptying and associated malnutrition make the child at-risk for aspiration, altered pharmacokinetics of the drugs and poor wound healing.[3] In addition, muscle spasms, and deformities may lead to difficulties in patient positioning, intravenous access, and vulnerability to pressure sores.[1] Often, a multidisciplinary approach is needed for appropriate management. Active warming to prevent hypothermia, regional pain management techniques, proper intravenous access, ensuring smooth emergence, nutritional status, addressing the use of anticonvulsants and antispasmodics in these patients and awareness about the increased risks of Latex allergy in these patients are some essential steps in planning the anesthetic management of these patients. These factors influence the anesthetic management in pre-operative, intra-operative and post-operative periods. *Figure 1* summarizes the important concerns during general anesthesia in CP patients.

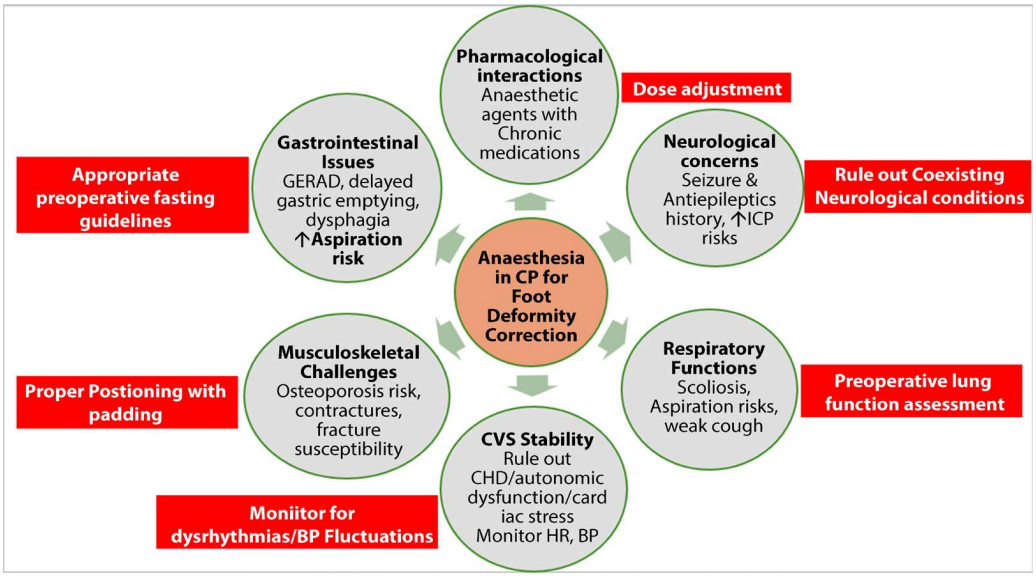

Figure 1: Summary of the Anesthetic Concerns in a child of Cerebral Palsy (CP), **GERAD** – Gastroesophageal reflux disease, **ICP** – Intracranial pressure, **HR** - Heart rate, **BP** – Blood Pressure, **CHD** – congenital heart disease

In this case, with the continuation of Valproate in the peri-operative period for seizures, Atropine and Fentanyl for pre-medication, induction was done with Propofol and maintenance with Propofol, Isoflurane (0.5 MAC) and oxygen; supraglottic airway device was used to secure airway. Patient had intra-operative seizures which could be controlled with Lorazepam. Child had smooth emergence and Oxycodone helped in pain-free post-operative course.

To conclude, anesthesia in spastic CP requires proper pre-operative assessment; possibilities of a difficult airway with aspiration risk necessitate appropriate preparedness; careful drug dosing in view of anticonvulsant interactions, protection during positioning, and meticulous postoperative care for respiratory complications help in achieving the twin goals of safe anesthesia for the procedure and pain-free post-operative period.

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