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A CASE REPORT OF ANAESTHETIC MANAGEMENT OF KYPHOSCOLIOSIS WITH DEAF-MUTISM FOR UPPER LIMB SURGERY

Anesthesiology

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ABSTRACT

Anaesthetic management of kyphoscoliosis presents as challenge for anaesthesiologists whether for corrective surgery or for other surgeries. This patient being deaf-mute added to the difficulty as patient couldn't co-operate for pulmonary function tests and due to severe kyphoscoliosis and supraclavicular block was also a technical difficulty. However, patient's upper limb surgery was performed successfully under brachial plexus block by supraclavicular approach.

KEYWORDS

Kyphoscoliosis, Deaf-mute, Brachial Plexus Block

INTRODUCTION:-

Kyphoscoliosis is a disorder characterised by progressive deformity of spine consisting of posterior and lateral curvatures. It may cause difficulties with both general anaesthesia and regional anaesthesia. It also presents as technical challenge in terms of changes in cardiac and respiratory physiological function and other associated co-morbid conditions. These patients are at high risk for general anaesthesia because of extrinsic restrictive lung disease, difficult intubation, risk of regurgitation due to pharyngeal dysfunction and poor cough reflex in neuromuscular type of kyphoscoliosis. They are also at high risk for regional anaesthesia because of positional problems and distorted anatomy. During the preoperative visit, it is necessary to determine whether a patient's deafness is part of a syndrome complex. Eliciting a detailed history is often difficult, and appropriately targeted investigations (e.g., a patient's facial features or cardiovascular examination) may be required. During this time, it is imperative to assess and evaluate the patient's ability to express and communicate using gestures or facial expressions, and his or her educational background and ability to cooperate.[1]

We are reporting a case where patient couldn't undergo pulmonary function tests, patient's respiratory reserve was not known and hence it was decided not to put the patient under risk of general anaesthesia and proceed further with brachial plexus block considering patient's age and other risk factors.

CASE REPORT

A 50 year old female was referred to our hospital with history of fall 5 days back causing injury to right upper limb. There was no history of head injury, ear nose throat bleed, loss of consciousness or convulsions. Patient's brother gave history of patient being deaf and dumb since birth and history of convulsions at the age of 6 months. Later on patient developed kyphoscoliosis for which patient underwent corrective surgeries thrice at the age of 15yrs, 20yrs and 25yrs. All three surgeries were performed under general anaesthesia and patient had history of ICU admission for 4 days after her last surgery.

On general physical examination, apart from severe kyphoscoliosis patient had decreased air entry on right side and had restricted neck movements. Laboratory investigations revealed no abnormality. 2D ECHO was otherwise normal. Pulmonary function tests were advised but patient couldn't co-operate, hence fitness was to be decided on the basis of arterial blood gas analysis which was normal.

On arrival in operating room, all standard monitors were attached including pulse-oximetry, electrocardiogram and non-invasive blood pressure monitor. Patient's oxygen saturation of haemoglobin was 96%-97%. An 18-gauge intravenous access was secured on the contralateral forearm. Difficult intubation cart was kept ready in case of failed block or partial action of the block. Patient was placed in supine position with head turned 45 degree to the opposite side and right arm by the side of patient and hand on the abdomen. With the help of nerve stimulator and 22-gauge 5cm, short bevelled, Teflon coated needle nerve location was achieved. The nerve stimulator was set at a current intensity 1mA and response was noted distally for extension or flexion at wrist and of fingers. Once response was consistent even after gradual reduction in current intensity to 0.4mA local anaesthetic 2% lignocaine 3ml was injected due to which twitch subsided and hence location was considered adequate. Remaining local anaesthetic mixture of 13ml of 2%lignocaine and 0.5% bupivacaine 18ml was injected slowly. As patient was deaf and dumb, sensory block and motor block could not be elicited properly hence patient's response to pin prick was observed after 20 minutes. Patient was not reacting to pin pricks anywhere over the hand, arm and forearm, so patient was considered ready for surgery. Surgery lasted for 100 minutes and was uneventful. Patient was vitally stable throughout the procedure and maintained saturation of 98%-99% throughout the procedure on oxygen supplementation by nasal prongs @ 2litre/min. Additional analgesia was not required for 3 hours post operatively. Post operatively chest x-ray was taken to rule out the possibility of accidental pneumothorax. Patient was discharged 3 days later.

DISCUSSION

This case report focuses on the management of kyphoscoliotic patient who is also deaf and mute thus adding to the difficulty in managing the case.

Kyphoscoliosis is a spinal deformity characterized by anterior flexion (kyphosis) and lateral curvature (scoliosis) of the vertebral column. Idiopathic kyphoscoliosis, which accounts for 80% of cases, commonly begins during late childhood and may progress in severity during periods of rapid skeletal growth. The incidence of idiopathic kyphoscoliosis is approximately 4 per 1000 population. There may be a familial predisposition to this disease, and females are affected four times more often than males. Diseases of the neuromuscular system, such as poliomyelitis, cerebral palsy, and muscular dystrophy, may also be associated with kyphoscoliosis.[2]

Kyphoscoliosis results in functional changes with decrease in total lung capacity, vital capacity and a functional residual capacity. The severity of compression is directly related to the degree of Kyphoscoliosis angulations and is determined by measuring Cobb's angle which is defined as the angle between the perpendicular of the lines drawn parallel to the upper border of the highest and lower border of the vertebrae. If this angle is 40° the Cardio Pulmonary function frequently decreases and if 100° it significantly decreases.[3] In patients with kyphoscoliosis airway management and cardiorespiratory embarrassment make general anesthesia hazardous whereas regional anesthesia is fraught with technical problems due to abnormal curvature of spine thus causing distorted anatomy.[4] Our patient being deaf and mute was an added challenge for us. Anaesthesia for the deaf mute could be a challenging experience because of the potential for ineffective pre and postoperative communication. Physicians including anaesthetists have little training in communication skills for such situations.[5] Congenital deafness is associated with syndromes with anatomic and physiologic anomalies of anaesthetic significance. Treacher Collins syndrome (congenital and familial deformities of the

ears, eyes, maxilla and mandible) is a cause of difficult intubation.[6] Jervell and Lange-Nielsen syndrome (JLNS), is characterized by congenital deafness, long QTc interval and microcytic hypochromic anaemia and has been reported to cause a potentially fatal arrhythmia under halothane anaesthesia.[7] Our patient appeared normal so we postulate that her deafness might have been due to a late intra uterine infection or a possible ototoxic drug ingestion by patient's mother during pregnancy. Considering old age, history of post operative ICU admission in her last surgery and with no knowledge about patients respiratory reserve we decided to proceed with regional anaesthesia as scoliosis patients with severe restrictive lung disease could present problems during extubation, may require post-operative ventilation and difficulty in weaning off the ventilator. Peripheral nerve blockade using PNS was given to the patient but the procedure was also risky because of the chance of pneumothorax. Pneumothorax is the commonest complication of brachial plexus block especially when supraclavicular approach is used. The prevalence of pneumothorax following supraclavicular block ranges from 0.5 to 6 percent and diminishes with experience.[8] This is the first case to be reported in the literature, using supraclavicular block in kyphoscoliosis to the best of our knowledge.

In conclusion, in such cases peripheral nerve blockade using ultrasound guidance would be the best option as it exactly locates the nerve without causing complications such as pneumothorax and avoids the complications associated with general anaesthesia. And it also points out the important aspect of lack of experience in communication skills with deaf and dumb patients. The management of a deaf and mute patient requiring surgery necessitates proper planning; careful consideration of the recommendations summarized above may ensure a smooth perioperative course and a content patient.

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