

Spinal Anaesthesia in Kyphoscoliosis

Rajesh Kumar Verma*, Alpana Kaistha**, Kartik Syal*, Ramesh Kumar***

Abstract

The patients with spine abnormalities, present unique challenges to the health care provider responsible for administering sedation and anaesthesia during surgical and technical procedures. Spinal deformities may cause difficulties with both tracheal intubation and regional anaesthesia. This report describes the anaesthetic management for orthopaedic procedure that were performed in a patient with severe thoracolumbar kyphoscoliosis. After examining the risk factors, spinal block by injecting single dose hyperbaric local anaesthetic solution to intrathecal space was chosen to provide anaesthesia. Intrathecal hyperbaric bupivacaine 0.5% 10mg (2ml) was used, motor and sensory blockade T10 was achieved. The patient reported satisfactory anaesthesia and developed no complications. In conclusion, spinal anaesthesia can be successful even in case of thoracolumbar kyphoscoliosis.

Keywords: Kyphoscoliosis; Spinal Anaesthesia.

Case Report

A 75-year-old male, with S shaped curvature of spine-kyphoscoliosis was scheduled for surgery, open reduction and internal fixation for fracture tibia right lower limb. He was chronic

smoker for last 50 years and he smoked 15 biddies per day. He had history of shortness of breath grade 1(MMRC). He had hypertension for last 10 years and on medication.

His neck movements, including extension were limited. The patient was alert and co-operative. His airway was assessed as Mallampati class III (difficult oro-tracheal intubation is to be expected in class III and class IV). The thyromental distance was 5cm (predictor of difficult oro-tracheal intubation). The physical examination of patient has murmur in cardiovascular system and lung capacity was limited.

The routine investigations of patient were normal. Echocardiogram suggestive of mild tricuspid regurgitation but left ventricular ejection fraction was normal. The pulmonary function tests were suggestive of severe restriction.

The spinal anaesthesia was considered as best option for this patient. The patient was informed about what was involved in this type of anaesthesia and informed consent was taken from the patient. The preparations were made for airway, circulatory, ventilatory support, in the event of high spinal anaesthesia. Oxygen was administered by face mask and patient was continuously monitored with electrocardiography, pulse

oximetry and non-invasive blood pressure assessments.

Spinal anaesthesia was given in sitting position. After local anaesthetic infiltration, a 26-gauge Quincke spinal needle was inserted in L3-4 interspace in midline. After third attempt, we were able to do the lumbar puncture. The free flow of cerebrospinal fluid was observed and confirmed. The drug was administered, 10 mg of 0.5% hyperbaric bupivacaine which is a local anaesthetic. Hyperbaric solution of local anaesthetic is of high density as compared to cerebrospinal fluid. The patient was turned to supine position. The block was adequate with pin prick testing, sensory block up to T-10 and adequate motor blockade was achieved. The patient remained comfortable and hemodynamically stable throughout the forty-five minute procedure, which was uneventful. Post operatively, after 180 minutes of intrathecal injection, sensory and motor functions were completely restored. After five days, patient was discharged from hospital with no complications.

Author's Affiliation:

*Assistant Professor, **Junior Resident, 2nd Year MD, ***Associate Professor, Deptt. of Anaesthesia, Indira Gandhi Medical College, Shimla. 171001 Himachal Pradesh.

Corresponding Author:

Rajesh Kumar Verma, Assistant Professor, Deptt. of Anaesthesia, Indira Gandhi Medical College, Shimla. 171001 Himachal Pradesh.

E-mail: drrajeshkverma@gmail.com



Fig. 1:

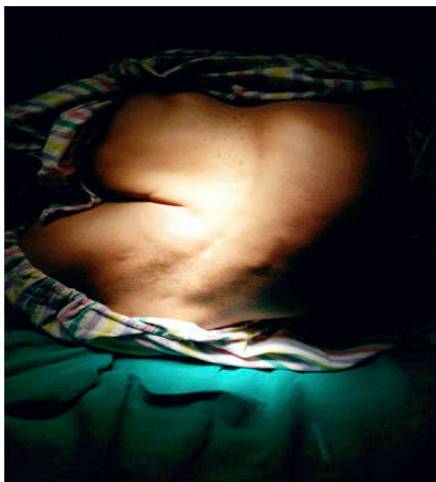


Fig. 2:



Fig. 3:

Discussion

Kyphoscoliosis is abnormal curvature of the spine both in coronal and saggital plane. It is a combination of kyphosis and scoliosis. This musculoskeletal disorder often leads to other issues in patients such as under-ventilation of lungs, pulmonary hypertension and difficulty in performing day-to-day activities. Kyphosis refers to an excessive convex curvature of spine in the thoracic and sacral regions. The normal thoracic curvature is convex shape and angles 20 abnormal curvature spine S or C shape.

The various kyphoscoliosis challenges are in respiratory and cardiovascular system as well as in musculoskeletal system. The various pulmonary issues include functional changes as well as decrease in total lung capacity, decrease in vital capacity and functional residual capacity. The cardiac changes may be associated with increase in pulmonary vascular resistance and pulmonary hypertension. It may result in right ventricular hypertension and right ventricular failure. It is because of hypoxemia leading to pulmonary vasoconstriction which lead to increase in pulmonary vascular resistance finally increases pulmonary artery pressure. The main handicap of general anaesthesia is that ideal position for laryngoscopy and intubation may not be possible. The level and degree of deformity in general anaesthesia can lead to relaxation of the pharyngeal elements. The pre-existing airway obstruction can increases chances of post-operative complications.

Regional anesthesia can be given and case reports of successful spinal anesthesia in patients with severe kyphoscoliosis had been reported. The main handicap of regional anaesthesia are decreased success rate due to unsuccessful insertion, multiple attempts, false loss of resistance, dural puncture, failed or inadequate block. Viewing the anteroposterior and lateral X-rays or USG prior to attempting block can overcome some of the technical difficulties by identifying the level and approach. Severe kyphoscoliosis can be associated with decreased volume of cerebrospinal fluid and with hypobaric solution or rapid injection, a higher than expected level can occur. So we used hyperbaric solution for intrathecal injection.

Spinal anesthesia is less reliable in kyphoscoliosis but successful outcomes have been described (Moran and Johnson 1990; Douglas 1995; Dresner and Maclean 1995; Hatzakorizan et al. 2001, Gurayten Ozyurt et al. 2005). In one case of a patient with severe kyphoscoliosis, an attempt at continuous spinal anesthesia with hyperbaric bupivacaine was

unsuccessful, and adequate surgical anesthesia was only achieved by adding isobaric bupivacaine solution (Moran and Johnson 1990). Douglas (1995) described an asymmetric block in a patient with marked scoliosis; the patient had incomplete block on left, but satisfactory spinal block was obtained with hyperbaric bupivacaine after table was tilted to left. In 2005 Gurayten Ozyurt successfully reported spinal anesthesia in patient with severe thoracolumbar kyphoscoliosis for urological surgeries.

In our case, we preferred regional anesthesia over general anesthesia, as patient was elderly with hypertension, chronic smoker. It was anticipated difficult intubation as patient Mallampati score was III and thyromental distance was 5cm. Moreover patient was having restrictive pulmonary functions and mild tricuspid regurgitation. So we decided to give spinal anesthesia in our patient and we achieved symmetrical sensory and motor blockade with injection of hyperbaric bupivacaine. This case demonstrates that spinal anesthesia can be successful even in cases of severe thoracolumbar kyphoscoliosis. Interathecal injection of hyperbaric solution can produce symmetrical and adequate motor and sensory blockade in patients with extreme spinal deformities or musculoskeletal conditions affecting spinal column.

Conclusion

Regional anesthesia can be given in patients with severe kyphoscoliosis, even chances of partial effect and asymmetrical blockade are there due to curvature of spine.

References

1. Gurayten Ozyurt, Elif Basagan-Mogol et al: Spinal Anesthesia in patient with severe thoracolumbar kyphoscoliosis. *Tohoku J Exp Med* 2005; 207: 239-242.
2. Oksum Kim, Sang seock Lee et al. Combined spinal epidural anesthesia in a patient with severe thoracic kyphoscoliosis. *Korean J Anesthesiol* 2008; 54(4): 446-48.
3. Douglas, M.J. Unusual regional block. *Can J Anesth* 1995; 42: 362-63.
4. Sunanda Gupta, Geeta Singariya. Kyphoscoliosis and pregnancy. *Ind J Anesth* 2004; 48(3):215-20.
5. Joseph F. Costello, Mrinalini Balki. Cesarean delivery under ultrasound guided spinal anesthesia, in a parturient with poliomyelitis and Harrington instrumentation. *Can J Anesth* 2008; 55:606-611.