



**ORIGINAL RESEARCH PAPER**

**ANAESTHESIOLOGY**

**ANAESTHETIC MANAGEMENT IN SHORT STATURED PRIMI WITH KYPHOSCOLIOSIS WITH PULMONARY STENOSIS WITH DOUBLE OUTLET RIGHT VENTRICLE**

**KEY WORDS:** Kyphoscoliosis, Short stature , Pulmonary stenosis, General anaesthesia

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**ABSTRACT**

Kyphoscoliosis is spinal deformity with lateral and posterior curvatures. Anaesthetic management in such patients is challenging due to difficult spine, restrictive lung disease, hypoxia, hypoventilation, mixing of oxygenated and deoxygenated blood in DORV, risk of heart failure in pulmonary stenosis.  
**SUMMARY:** A patient with kyphoscoliosis with restrictive lung disease and associated cardiac disease is a challenging task for an anaesthesiologist. This report highlights the anaesthetic challenge, multidisciplinary approach of management and importance of early planning of anaesthetic technique for successful intraoperative management.

**INTRODUCTION:-** Kyphoscoliosis is disruption of balance between structural and dynamic components of neuromuscular elements of spine associated with lateral and posterior curvature. Anaesthetic management in patient of kyphoscoliosis with cardiac abnormality i.e. PS(pulmonary stenosis) and DORV(double outlet right ventricle) is challenging due to restrictive lung disease, mixing of oxygenated and deoxygenated blood, risk of hypoxia, hypoventilation, heart failure in PS and pulmonary arterial hypertension in DORV. DORV is condition in which right ventricle is divided by aberrant muscular bands into proximal high pressure chamber and distal low pressure chamber. It is associated with pulmonary arterial hypertension .

**CASE REPORT:** A 32 year female with kyphoscoliosis with short stature with 2D echo finding of PS and DORV was scheduled for elective caesarean section at 36 weeks.

- General Physical Examination: The patient weighing 38 kg presented with 36 weeks of amenorrhoea was short statured height 137 cm, spine showed kyphoscoliosis in dorsolumbar region, PR- 98/min regular, BP-110/72 mm of hg, RR-12-14/min, SpO<sub>2</sub> on air 99%.



- **Airway: Mallampati grade I , mouth opening: adequate, short neck with neck extension being restricted.**

**Systemic Examination:** Respiratory system showed B/L air entry+ and clear, CVS system showed S1, S2+, pansystolic murmur+ .

Abdominal examination- uterus 36 weeks, relaxed, cephalic presentation, head fixed, FHS +.

**Investigations:** All routine blood investigations, PFT ,Doppler foetal monitoring within normal limits. ECG showed LAD+RVH.

**2D ECHO:** severe valvular PS, Biventricular hypertrophy, small sub Aortic VSD, Double outlet right ventricle (DORV), Pulmonary valve-thick, doming, PS G max- 100 mmHg, moderate TR with TR G max 19mm. RVOT muscle bundle with G max- 100 mmHg.

**Cardiology opinion-** PS with DORV advisable to do elective LSCS.

Informed written consent with ASA physical status IV was taken.

**Preoperative Preparation:**

1. Stylet
2. Proper sized endotracheal tube
3. I gel
4. Bougie
5. Nebuliser
6. Drugs – Phenyleprine, Ephedrine, Amiodarone, Diltiazem, Atropine, Adrenaline, Esmolol, Adenosine etc
7. Ionotrops
8. Defibrillator

Patient was nebulised in morning before elective LSCS. Pt was placed in left lateral position with 30° tilt to prevent aortocaval compression. ECG, SPO<sub>2</sub>, NIBP, urine output and NMT monitors attached and arterial line was secured. Patient was preoxygenated with 6-8 lit of 100% O<sub>2</sub> for 3 to 5 min via baird circuit, induced with Inj Etomidate 0.3mg/kg iv and after check ventilation Inj Succinylcholine 2 mg/kg iv was given and intubated with 7.0 mm ET tube along with EtCO<sub>2</sub> monitoring. After induction pt was vitally stable P-88/min, BP- 114/72 mm of hg and saturation was 99%. Maintenance was done with O<sub>2</sub>+ SEVO+ N<sub>2</sub>O+ Inj Atracurium 0.5mg/kg . Inj NTG drip of 0.1mg/ml was started to maintain BP n titrated accordingly. A live male child of weight 1.4 kg was delivered and cried immediately after birth with APGAR score of 7. Delivery of baby was difficult due to contour of abdomen and chest. Sequential ABGA were normal. 380 ml DNS and Inj Lasix 10 mg was given intraoperatively. Inj Pitocin 20 units in 500 ml NS started after delivery of anterior shoulder of baby. Inj Fentanyl 50 microgram and Inj Dynapar 75 mg iv given. Local infiltration with Inj Bupivacaine 0.25% 15 ml given at incision site. Intraoperatively pulse rate , BP, and saturation were stable. Neuromuscular blockage was reversed on basis of TOF response with Inj Neostigmine 0.05mg/kg given after Inj Glycopyrrolate

0.008mg/kg. After thorough oral and endotracheal suction patient was extubated after becoming fully conscious with adequate motor activity and tidal volume. Post extubation vitals PR-102/min, BP- 110/76 mm of hg,SPO2- 99% and was kept under observation in 24 hours post operative unit and nausea, vomiting , analgesia was taken care of. Whole course was uneventful. The patient was stable and was discharged on 10<sup>th</sup> postoperative day without any complications.

#### DISCUSSION:

Kyphoscoliosis refers to abnormal curvature in spine in both coronal and sagittal planes which occurs due to disruption of balance between structural and dynamic components of neuromuscular elements of spine.

- In kyphosis there is curving of spine which causes bowing of back and scoliosis is defined as lateral rotation of spine( usually > 10%) accompanied by rotation of vertebral body.
- Incidence 4:1000 associated with restrictive stage COPD, pulmonary hypertension, arterial hypoxemia. Kyphoscoliosis involving upper thoracic and cervical spine causes chances of difficult intubation and severity of pulmonary impairment, neuromuscular disease, severe restrictive pulmonary dysfunction can add the risk of post operative mechanical ventilation.
- Due to vertebral deformity, there are chances of technical difficulties for spinal and epidural space location.
- Bronchodilators may be used as a part of optimisation of lung function preoperatively.
- DORV refers to any cardiac anatomy in which both the aorta and pulmonary trunk originate from the right ventricle , both the systemic and pulmonary circulations are in parallel.
- A change in pulmonary circulation can bring about cyanosis on one end to frank congestive failure on the other end.

PS is associated with increased right ventricular filling pressures so it is important to maintain right ventricle filling pressure, left ventricular afterload and right ventricular contractility and avoid further increase in pulmonary vascular resistance.

#### CONCLUSION:

Anaesthetic management in such patient is challenging due to presence of spine deformity and associated complication cardiac anomaly, risk of hypoxia, hypercapnia and hypoventilation. General anaesthesia is safe in such patient as it offers safe approach for fluid management, hypotension, hypoxia, ventilation. Post operatively oxygen supplementation is needed.

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