ISSN (O):2395-2822; ISSN (P):2395-2814

Succinylcholine Induced Masseter Muscle Spasm during Rapid Sequence Induction in a Pregnant Patient with Kypho- Scoliosis: Case Report.

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Received: January 2019
Accepted: January 2019

ABSTRACT

Isolated masseter spasm is a rare entity encountered in patients with neuromuscular disorders and is frequently associated with use of succinylcholine or halogenated inhalational anaesthetic during induction. We present a case of 32-year old primigravida obstetric patient with kypho-scoliosis posted for lower segment caesarean section that developed masseter muscle spasm (MMS) following administration of a standard dose of succinylcholine. The episode resolved spontaneously after 6-7 min without progression to malignant hyperthermia. The report highlights that an event of masseter muscle spasm, though, rarely encountered in life-time practice of an anaesthesiologist, may be successfully managed by maintaining oxygenation and ventilation till the crisis is tided over.

Keywords: Succinylcholine, Masseter muscle spasm (MMS), malignant hyperthermia (MH), Kypho-scoliosis.

INTRODUCTION

It has been mentioned widely in the literature that "Failure to intubate may not kill, but failure to ventilate and oxygenate definitely kills a patient." Isolated masseter muscle spasm is a rare entity encountered in patients with neuromuscular disorders and is frequently associated with the use of succinylcholine or halogenated inhalational anaesthetics during induction. There are 50% chances of progression to malignant hyperthermia in patients who have developed an episode of masseter spasm.[1] Literature suggests the association of masseter muscle spasm with malignant hyperthermia and other muscular dystrophies,[2,3] but no correlation of masseter muscle spasm has been reported with kypho-scoliotic disorder.

CASE REPORT

A 32-year old primigravida presented to our institute for caesarean section in view of cephalo-pelvic disproportion with associated kypho-scoliotic disorder since childhood. Preoperative assessment revealed the patient's weight of 54 kg, a height 4 feet 5 inch and no relevant surgical history. Physical examination revealed normal vital signs and cardio-respiratory function, an adequate mouth opening with Mallampati grade II, normal neck movements and a kypho-scoliotic thoraco-lumbar spine [Figure 1]. All blood investigations were within normal limits. Written informed consent was taken from patient and relatives prior to the procedure. It was planned to give an attempt of regional anaesthesia prior to general anaesthesia in view of poor respiratory functional reserve due to the deformed thoraco-lumbar spinal anatomy of the patient. After anti- emetic prophylaxis and pre-loading with intravenous (i.v.) fluid, patient was shifted to operation theatre. Standard monitoring was used and in sitting position, spinal anaesthesia was attempted using midline and paramedian approach, however all attempts were unsuccessful. Thereafter, it was planned to administer general anaesthesia and the patient was pre-oxygenated with 100% oxygen for 5 minutes. Using rapid sequence induction technique, Inj. glycopyrrolate 0.2 mg + Inj. propofol 100 mg + Inj. succinylcholine 100 mg i.v were administered. After the succinylcholine induced fasciculations passed, mouth opening was attempted using head tilt manoeuvre to introduce the laryngoscope blade, but the mouth did not open. A jaw thrust manoeuvre was performed but the teeth were tightly clenched thereby limiting the entry of tip of the laryngoscope

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blade. Continuous cricoid pressure was maintained and positive pressure ventilation was continued using bag and mask [Figure 2]. Despite the presence of restricted mouth opening, the neck and chest movements were normal along with presence of bilateral air entry on auscultation during mask ventilation, so a differential diagnosis of malignant hyperthermia was made. Meanwhile, an immediate call for help was made and a nasopharyngeal airway was inserted and bag and mask ventilation was continued with positive pressure ventilation. Using bag-mask ventilation, SpO2 of > 92% was maintained along with an EtCO2 of 30-32 mmHg during this episode. In the meantime, preparations for surgical crico-thyroidotomy and tracheostomy were made. After approximately 6-7 minutes post-administration of succinylcholine, the rigidity of masseter muscle resolved spontaneously. The attempt at laryngoscopy and tracheal intubation succeeded due to adequacy of mouth opening. Thereafter, anaesthesia was maintained with O2 + N2O + propofol infusion and Inj. vecuronium in incremental doses, thereby avoiding triggering factor like halogenated inhalational agents. Patient's temperature, end tidal CO2, heart rate and blood pressure remained within normal limits during intraoperative and postoperative period. Thus, a final diagnosis of isolated masseter muscle spasm was made. Patient was shifted to surgical ICU for post-operative care and later a radiographic evaluation of thoraco-lumbar spine was performed to evaluate the severity of kyphoscoliosis [Figure 3]. The patient was discharged in good-health on 5th post-operative day.

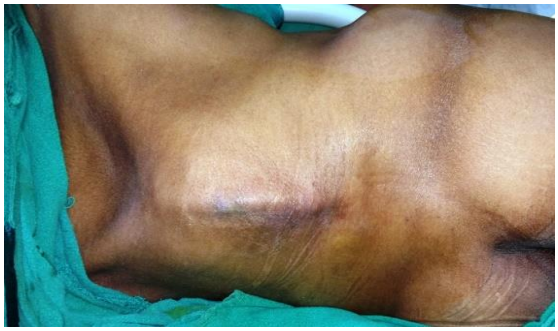

Figure 1: Fixed Kyphotic deformity of thoracic spine in lateral position.

Figure 2: Mask ventilation of patient during an episode of masseter spasm.

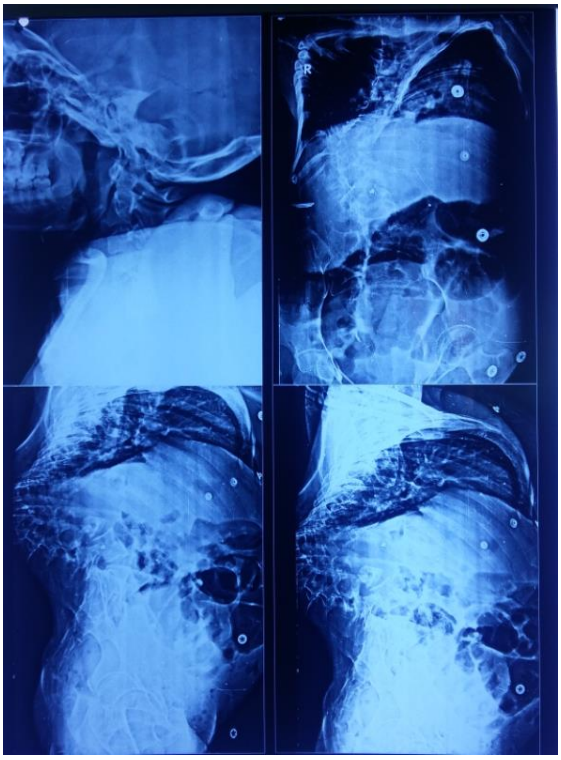

Figure 3: X-Ray of Thoraco-Lumbar spine in: Antero-posterior and lateral view depicting the severity of kyphoscoliosis and resultant reduction in lung volume.

DISCUSSION

Masseter Muscle Spasm has been referred to as an early symptom,[4] while a disproportionate and abrupt raise in EtCO2 an early sign of malignant hyperthermia. Generally, the estimated prevalence of malignant hyperthermia is approximately 1 in 50,000 or less.[5] The overall incidence of malignant hyperthermia has been reported to be 1:40,000 to 1:50,000 in adult population and 1: 15,000 in pediatric age group.6 In a prevalence and clinical outcome study from New York State from 2001 to 2005, the estimated prevalence of MH for males was 2.5-4.5 times more than females, and the median age at presentation was 22 years with 45% of MH cases occurring in those who were 19 years or younger.[5] Occurrence of isolated masseter muscle spasm has been reported to be less than 1% in paediatric population while the same is unknown in adult population.[7,8] There is generally an interval of 20-30 min between masseter muscle spasm and initiation of malignant hyperthermia.[7] Malignant hyperthermia has been associated with a higher frequency in patients with musculoskeletal abnormalities such as strabismus, ptosis, myotonic dystrophy, kyphoscoliosis, muscular dystrophy, central core disease, and marfanoid syndrome.[3] Onyeka reported a case of masseter muscle spasm in a 41-year old women undergoing gynaecological procedure where he observed difficult mouth opening following succinylcholine administration. He encountered a case of difficult laryngoscopy and

difficult intubation but at last, he was able to manage the airway by laryngeal mask airway.[9] Similar to our case report, Mamta Sharma et al had reported a case of masseter muscle spasm following a standard dose of intravenous succinylcholine in a 36-year old male posted for surgical repair of epigastric hernia. After spontaneous resolution of the spasm they secured the airway with endotracheal tube.[10] Failed intubation is an important cause of morbidity and mortality during anesthesia and requires that the anesthetist uses an alternative technique to secure the airway, especially in cases requiring rapid sequence induction.[9] Literature suggests that pre-curarisation with vecuronium reduces the incidence of masseter muscle spasm and propofol reduces the masseter muscle tension more effectively than thiopentone.[11] Many lessons can be learned from this case scenario. Firstly, patients should be properly evaluated for past history of any significant neuromuscular event following previous anaesthetic exposure. Secondly, the adverse effects of succinylcholine remains unanticipated so, emergency physicians need to be aware of its adverse effects and must be prepared to deal with them, including the potential for masseter spasm and malignant hyperthermia. Thirdly, difficult airway cart must be available at hand, for managing masseter muscle spasm in emergent situations.

CONCLUSION

An event of masseter muscle spasm though, a rare entity, can be successfully managed by maintenance of oxygenation and ventilation through conventional means like bag and mask ventilation, till the crisis is dealt to avoid any morbidity and mortality.

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How to cite this article: Bansal P, Jain P, Singh S, Singh K. Succinylcholine Induced Masseter Muscle Spasm during Rapid Sequence Induction in a Pregnant Patient with Kypho- Scoliosis: Case Report. Ann. Int. Med. Den. Res. 2019; 5(2):AN09-AN11.

Source of Support: Nil, **Conflict of Interest:** None declared