International Journal of Medical Science in Clinical Research and Review
Online ISSN: 2581-8945
Available Online at https://ijmscrr.in/ Volume 8|Issue 02 (March-April) |2025 Page: 160-163

Case Report

Anaesthetic management for a case of thymectomy in a patient with myasthenia gravis – A Case Report

Authors:
Dr. Hema Kamodula, Dr. Kedareshwara K.S., Dr. Mahantesh Mudakanagoudar
KLE's Dr Prabhakar Kore Hospital and MRC, Belagavi
Professor, Department of anaesthesia, KLE's Dr Prabhakar Kore Hospital and MRC, Belagavi https://orcid.org/0000-0002-1493-2453
Professor, Department of anaesthesia, KLE's Dr Prabhakar Kore Hospital and MRC, Belagavi, https://orcid.org/0000-0001-5924-6708
Corresponding Author*:*
Dr. Hema Kamodula

Article Received: 02-February-2025, Revised: 21-February-2025, Accepted: 11-March-2025

ABSTRACT:
Myasthenia gravis is characterized by autoantibody attack of acetylcholine receptors at the motor end plate of striated muscles. Anaesthetic implications include respiratory failure, delayed postoperative extubation. Markedly higher sensitivity to muscle relaxants is observed in this group of patients which can exacerbate these complications. Hence proper and optimal planning of intraoperative management is important.

CASE REPORT:
A 51 year old male diagnosed with Myasthenia Gravis posted for Thymectomy. On pre anaesthetic evaluation , patient revealed history of oral Pyridostigmine and oral Glycopyrrolate therapy since 2 years. Thoracic epidural was secured to alleviate the surgical pain due to sternotomy. Patient was premedicated with Inj. Glycopyrrolate 0.2mg IV, Inj. Midazolam 2mg IV, Inj. Fentanyl 100mcg IV. Patient was induced with Inj. Propofol 140mg IV. Patient was then intubated with 8.0mm I.D flexometalic tube. Maintenance of anaesthesia was done with oxygen, nitrous oxide, Sevoflurane (MAC: 1.7), Inj. Fentanyl Infusion (20mcg/ml; rate of 20ml/hr) Inj. Propofol (10mg/ml; rate of 30ml/hr). Invasive and non invasive haemodynamic monitoring was achieved, along with temperature monitoring. Complete awake extubation with Inj. Sugammadex 200mg IV was done.

CONCLUSION:
The patient with Myasthenia Gravis was successfully managed under general anaesthesia without the usage of neuromuscular blockade and optimal monitoring along with thoracic epidural for management of post operative analgesia and extubated without any untoward complications.

Keywords: Myasthenia gravis, anaesthesia, thymectomy

INTRODUCTION:

Myasthenia gravis (MG) is a chronic autoimmune neuromuscular disease. It is characterized by an autoantibody attack of acetylcholine receptors at the motor end plate of striated muscles, which results in variable muscle weakness made worse by exercise [1]. There is a close relationship between immune processes accompanying myasthenia gravis and the thymus, which has been found to contain production sites of B-cells synthesizing anti-receptor antibodies [2]. Surgery and anesthesia in myasthenic gravis patients are associated with an increased risk of death and severe complications. The risk is mainly related to a markedly higher sensitivity to muscle relaxants observed in this group of patients, even in periods of complete remission [3]. Myasthenia patients often require prolonged ventilation in the ICU setting [4, 5, 6,]. The most proper approach during anaesthesia in patients with myasthenia gravis is to apply deep inhalational anaesthesia without muscle relaxing agents.

Table 1 Myasthenia Gravis Foundation of America clinical classification

Class	Description
I	Any ocular muscle weakness; all other muscle strength is normal
II	Mild weakness affecting muscles other than ocular muscles A: Predominantly affecting limb, axial muscles or both B: Predominantly affecting oropharyngeal, respiratory muscles or both
III	Moderate weakness affecting muscles other than ocular muscles A: Predominantly affecting limb, axial muscles o

CASE REPORT:

A 51 year old male diagnosed with Myasthenia Gravis posted for Thymectomy. The patient was graded as Osserman stage IIa. On pre anaesthetic evaluation , patient revealed history of oral Pyridostigmine and oral Glycopyrrolate therapy since 2 years. The patient was scheduled for surgery under general endotracheal anaesthesia (ASA class III). On entering the operating room, ASA standard monitors such as blood pressure, pulse oximetry, electrocardigram were placed. Central venous catheterization was done. Invasive blood pressure monitoring was achieved by cannulating the left radial artery. Thoracic epidural was secured to alleviate the surgical pain due to sternotomy. Patient was premedicated with Inj. Glycopyrrolate 0.2mg IV, Inj. Midazolam 2mg IV, Inj. Fentanyl 100mcg IV. Patient was induced with Inj. Propofol 140mg IV. Patient was then intubated with 8.0mm I.D flexometalic tube. Maintenance of anaesthesia was done with oxygen, nitrous oxide, Sevoflurane (MAC: 1.7), Inj. Fentanyl Infusion (20mcg/ml; rate of 20ml/hr) Inj. Propofol (10mg/ml; rate of 30ml/hr). Neuromuscular blocking agents were completely avoided. Invasive and non invasive haemodynamic monitoring was achieved, along with temperature monitoring.

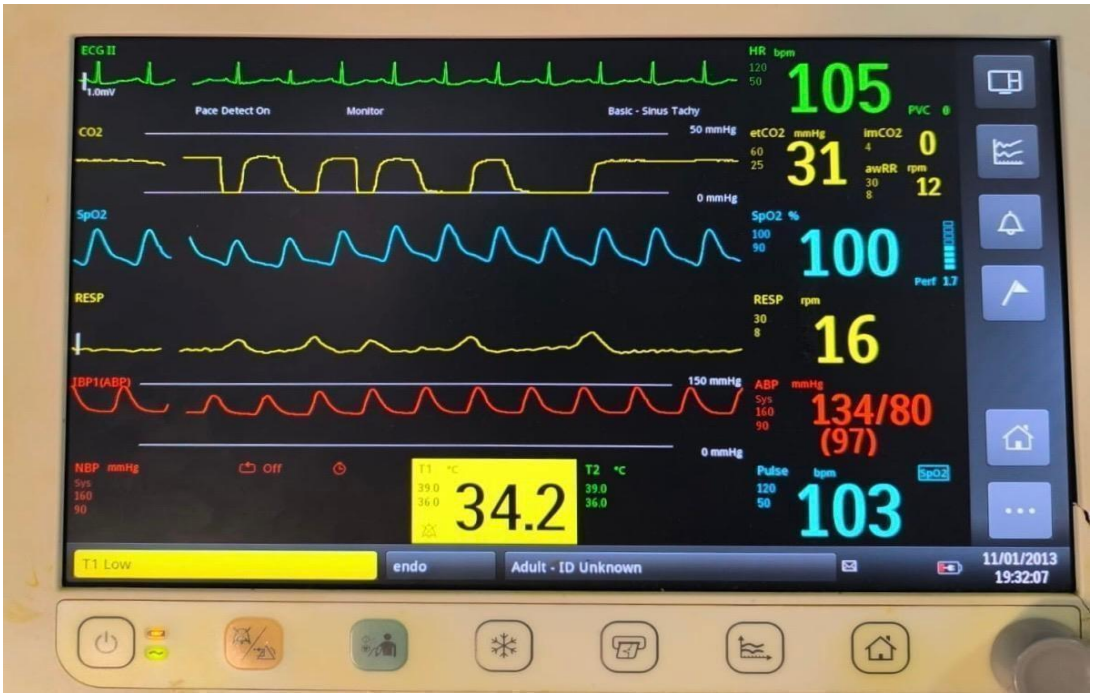

Fig 1: Standard ASA Monitoring: Electrocardiogram, capnography, oxygen saturation, respiratory rate, invasive blood pressure, temperature monitor.

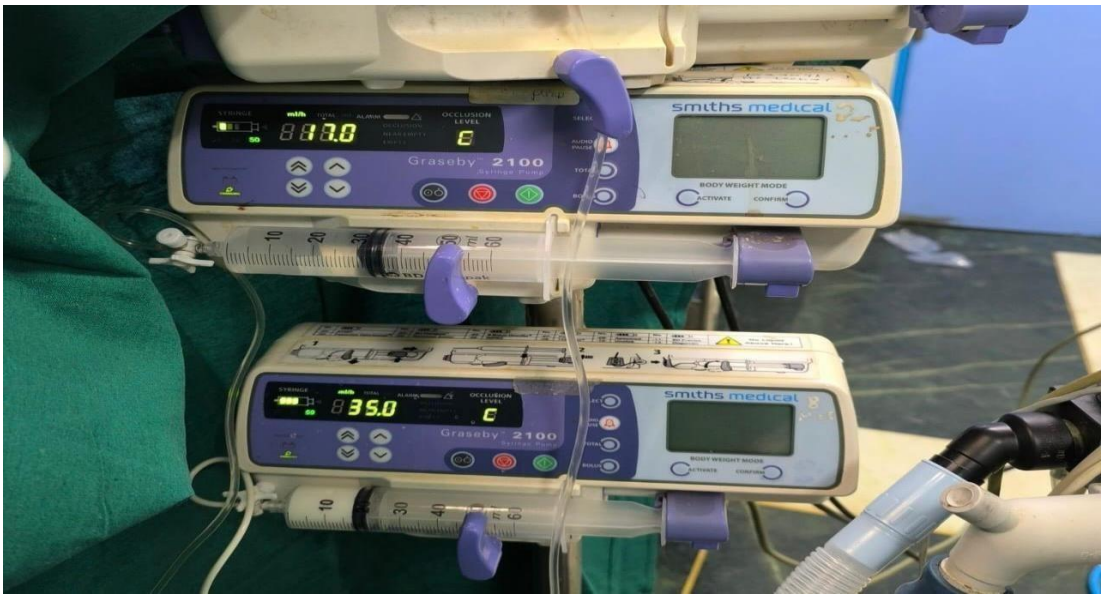

Fig 2: Maintanence of anaesthesia by Fentanyl infusion and propofol infusion without the usage of neuromuscular blockade.

Emergence from anaesthesia was initiated at the time of placement of the final skin suture by stopping propofol and fentanyl infusions. Sevoflurane was terminated. Patient was extubated after confirming extubation criteria. Upon emergence from anaesthesia and extubation, the patient was transferred to the recovery room of the Anaesthesia and Intensive Care Department. Full verbal contact and recovery of consciousness with the patient was maintained at the time of transfer to the recovery room. The patient's respiratory function and circulatory status were uncompromised. Postoperative analgesia was provided with epidural 0.125% Bupivacaine administered in a continuous infusion. The patient stayed in the recovery room of the Anaesthesia and Intensive Care Department for 20 h before being transferred to the Department of Oncology. During 7 days postoperative stay in the Department of General and Colorectal Surgery, the patient received epidural 0.125% Bupivacaine infusion along with NSAIDS. The patient was discharged on the 8th postoperative day.

DISCUSSION:

Myasthenia gravis patients, particularly those undergoing major surgery and/or suffering from concomitant disorders, require special individual management in preparation for surgery [3], appropriate selection and administration of anaesthesia, and close monitoring postoperatively [7]. This also applies to other groups of patients with nervous system disorders including myopathies and other muscular diseases [8,9]. During general anaesthesia, neuromuscular monitoring is essential to avoid problems of prolonged neuromuscular block in myasthenic patients. Certain studies have shown that using one-tenth of the dose of vecuronium does not cause respiratory depression or delay extubation [10] .The possible interaction between anticholinesterases (in this case neostigmine) with both the depolarizing and non-depolarizing muscle relaxants is also a cause of concern[11] . The respiratory insufficiency caused by them known as myasthenic crisis is one of the most common causes of prolonged ventilator requirement in patients of MG. Epidural anaesthesia causes sympathetic blockade with blood vessel dilation and venous stasis; thus hypovolaemia as a result of a haemorrhage is more difficult to compensate than general endotracheal anaesthesia, especially in elderly patients. The best way of preparing a patient for a surgical procedure is to recognize and understand both the underlying medical condition and coexisting diseases. Proper awareness of these makes it possible to arrange individual pre-, peri- and postoperative management. The procedure was followed in the case reported here. Each stage of perioperative care was thoroughly analysed and planned. Multimodal analgesia and anesthesia is preferred in form of inhalational agent along with thoracic epidural analgesia. Thoracic epidural analgesia suppresses hormonal metabolic stress induced pain and provides stable hemodynamics for the surgery . It is also helpful in providing postoperative pain relief without affecting respiration [11]. Sevoflurane was preferred due to its low blood/gas and tissue/gas solubility[12] . Muscle relaxants were not used. Hence, the Propofol requirement at induction was much higher compared to normal healthy patient. Propofol has the advantages of short duration of action without effect on neuromuscular transmission. Opioid analgesics in therapeutic concentrations do not appear to depress neuromuscular transmission in myasthenic muscle. Based on the preoperative condition of the patient, the surgical procedure, and the residual anesthetic effects, a carefully planned extubation is carried out. Adequate postoperative pain control, pulmonary toilet, and the avoidance of drugs that interfere with neuromuscular transmission

will facilitate tracheal extubation[13] . Even though the respiratory effort might be good post operatively, respiratory muscle weakness usually develops few ours later and hence it is necessary to postpone the extubation for such patients. It is also essential that these patients receive their medication as per previous orders after the surgery. The patient had a near normal recovery probably due to good control of his MG and his compliance with medication[14].

CONCLUSION:

There are multiple implications for safe anaesthesia and respiratory depression in patients of MG. Hence, comprehensive understanding of this disorder is vital prior to any intervention. In the postoperative period, ventilatory parameters need vigilant monitoring as these patients have propensity to develop respiratory failure [11] . The combination of volatile anaesthetic, Inj. Propofol, Inj. Fentanyl and thoracic epidural analgesic infusion was tolerated well for intubation as well as for quick transition to spontaneous breathing and good post-operative analgesia and an uneventful recovery.

Financial support and scholarship: Nil

Conflicts of Interest: There are no conflicts of Interest

REFERENCES:

1. Conti-Fine BM, Milani M, Kaminski HJ. Myasthenia gravis: past, present, and future. J Clin Invest 2006; 116: 2843-54.
2. Bachmann K, Burkhardt D, Schreiter I, et al. Thymectomy is more effective than conservative treatment for myasthenia gravis regarding outcome and clinical improvement. Surgery 2009; 145: 392-8.
3. Dillon FX. Anesthesia issues in the perioperative management of myasthenia gravis. Semin Neurol 2004; 24: 83-94.
4. Mincewicz G, Aloszko A, Nyka W, Bilińska M, Krzykowski G, Nyka WM. The comparison of selected spirometric parameters with functional muscles exercise evaluation in patients with myasthenia [Polish]. Pol Merkur Lek 2007; 22: 177-81
5. Haroun-Bizri S, Maalouli J, Deeb P, Baraka A. Anesthetic management for a patient with myasthenia gravis undergoing coronary artery bypass graft. Middle East J Anesthesiol 2003; 17: 299-305.
6. Heliopoulos I, Patlakas G, Vadikolias K, et al. Maximal voluntary ventilation in myasthenia gravis. Muscle Nerve 2003; 27: 715-9.
7. Cardone A, Congedo E, Aceto P, et al. Perioperative evaluation of myasthenia gravis. Ann Ital Chir 2007; 78: 359-65.
8. Adam JM, Bennett DJ, Bom A, et al. Cyclodextrin-derived host molecules as reversal agents for the neuromuscular blocker rocuronium bromide: synthesis and structureactivity relationships. J Med Chem 2002; 45: 1806-16.
9. Tarver GJ, Grove SJ, Buchanan K, et al. 2-O-substituted cyclodextrins as reversal agents for the neuromuscular blocker rocuronium bromide. Bioorg Med Chem 2002; 10:1819-27
10. Tarver GJ, Grove SJ, Buchanan K, et al. 2-O-substituted cyclodextrins as reversal agents for the neuromuscular blocker rocuronium bromide. Bioorg Med Chem 2002; 10:1819-27
11. Srivastava VK, Agrawal A, Ahmed M, Sharma S. Anesthetic Management of a Patient with Myasthenia Gravis for Meningioma Surgery - A Case Report.Kathmandu Univ Med J 2015;49(1):80-2.
12. Başkan S, Örnek D, Güney A, Acar F, Saçan O et al. Management of Anesthesia in A Patient with Myasthenia Gravis. Int J Anesthetic Anesthesiol 2015;2:022.
13. Srivastava VK, Agrawal A, Ahmed M, Sharma S. Anesthetic Management of a Patient with Myasthenia Gravis for Meningioma Surgery - A Case Report. Kathmandu Univ Med J 2015;49(1):80-2.
14. Başkan S, Örnek D, Güney A, Acar F, Saçan O et al. Management of Anesthesia in A Patient with Myasthenia Gravis. Int J Anesthetic Anesthesiol 2015;2:022.