

Myasthenia gravis: Postop ventilation

Myasthenia gravis (MG) is an autoimmune syndrome where antibodies are produced against the nicotinic acetylcholine receptor on myocytes resulting in weakness. Patients with MG are profoundly sensitive to non-depolarizing muscle relaxants and these patients should be approached carefully with regards to their muscle relaxation needs and plan. Although the introduction of sugammadex has greatly improved the safety of patients with MG who need muscle relaxation, its use alone does not treat the disease nor eliminate the risk of postoperative respiratory failure or myasthenic crisis.

Previously, much interest, both clinically and for exams, was placed on predictors of the need for prolonged mechanical ventilation (defined as >300 minutes). Although the study was based on 24 patients who were getting thymectomy, its results (called the Leventhal criteria) have been widely regurgitated and applied, perhaps incorrectly, to a number of different patient populations. Additionally, I am unaware if there has been a good study looking at this question again in the era of sugammadex. Nevertheless, the 4 predictors found by Leventhal et al. in the 1970s were:

- Duration of MG > 6 years
- History of other chronic respiratory disease
- Pyridostigmine dose >750mg/day
- Vital capacity < 2.9 L

These four predictors seem to have the most staying power despite more recent studies (although still prior to sugammadex), with more patients. Other findings associated with prolonged postoperative ventilation include:

- Osserman's grade of MG of at least 2 (weakness beyond just ocular symptoms)
- History of myasthenic crisis
- Anti-acetylcholine receptor antibody levels > 100nmol/mL
- Thymoma present on CT scan
- Use of TIVA
- Duration of surgery > 180 minutes

Further reading:

Campos JH. Prediction of Postoperative Mechanical Ventilation After Thymectomy in Patients With Myasthenia Gravis: A Myth or Reality. *J Cardiothorac Vasc Anesth*. 2018 Feb;32(1):331-333. doi: 10.1053/j.jvca.2017.08.014. Epub 2017 Aug 10. PMID: 29109003.

NB: Test question writers seem to love myasthenia gravis and lambert-eaton syndromes and how different forms of muscle relaxation are affected by these disease states...know them well.