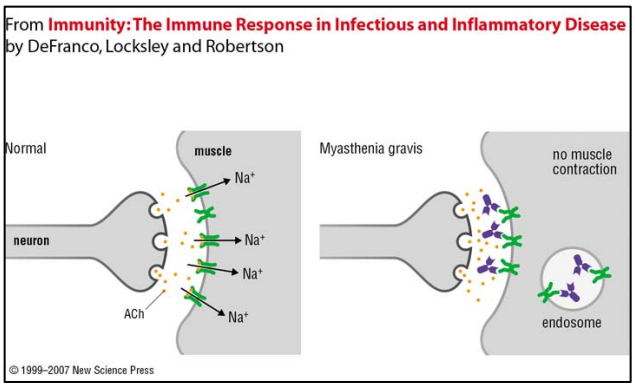
Myasthenia Gravis

Anesthetic Pearls: Pre-Op and Inter-Op Anesthetic Management of Myasthenia Gravis



Hallmark Characteristics: Weakness and rapid exhaustion of voluntary skeletal muscles with repetitive use that is followed by partial recovery with rest. The incidence is 1 in 20,000 adults. Females between 20 & 30 years old are most often affected.

Pathophysiology: The problem is a decrease in the ACh receptors at post-synaptic neuromuscular junction because of their destruction by circulating IgG's. Net result is fewer ACh receptors available for non-depolarizing muscle relaxants (Rocuronium, Vecuronium). Patients may become extremely sensitive to Succinylcholine.

Pre-Op Preparation:

1. Ask about the recent course of their disease, muscle groups affected, drug therapy, and coexisting illnesses. Patients with respiratory or bulbar involvement are at increased risk for pulmonary aspiration.
2. Pharyngeal and laryngeal muscle weaknesses should preclude the use of pre-op meds with potential respiratory depressant effect (Benzo's or opioids).
3. Advise patients that post-op vent support is a possibility and in some cases likely.
4. Order PFTs to get an idea of what the likelihood of post-op vent support need may be. Predictors of post-op vent support are:
   (a) Duration of disease >6 yrs
   (b) Coexisting COPD
   (c) Dose of Pyridostigmine >750 mg/day during the 2 days prior to surgery
   (d) Vital Capacity < 2.9 L
5. Continue anticholinesterase therapy -- more Ach available so these people have less weaknesses around their eyes, pharynx, larynx, and other skeletal muscles. Treatment also decreases the risk of gastric aspiration; however rapid-sequence induction is probably the safest. According to Roizen, anticholinesterase meds should be held 2-4 hours pre-op; then start IV Neostigmine 1 hour before emergence at 1/30 to 1/60 daily Pyridostigmine dose and infuse over 24 hours. However, Morgan advises individualized anticholinesterase therapy based on the severity of the symptoms. Potential problems include: altered patient requirement following surgery, increased vagal reflexes, possibility of disrupting bowel anastomoses secondary to hyperperistalsis, prolonged duration of ester-type local anesthetics and succinylcholine.
6. If the patient is on steroid therapy to reduce the production of IgG, be sure to check fluid and electrolyte status. Anyone on steroid therapy may have hyper / hypoaldosteronism, Cushing's syndrome, or glucocorticoid deficiency. Pay particular attention to Na^+ and K^+ abnormalities, hypo / hypertension, and volume depletion.
7. Stress steroid coverage is:
   (a) Minor surgery: 25 mg IV at induction for a 70 kg patient
   (b) Major surgery: 100 mg hydrocortisone/24 hours/70 kg.
8. Get an EKG to assess for myocardial changes. The strong association with Grave's disease makes these people also likely to have hyperthyroidism which can cause cardiac problems.

Anesthetic Management:

A. Induction / intubation / maintenance – Consider a breathe-down technique and avoid muscle relaxants. If the patients are pharmacologically treated, they are supposed to be resistant to non-depolarizers and sensitive to succinylcholine. However, their response to muscle relaxants is hard to predict therefore it is best not to give any.
B. Extubation – Post-operative difficulty with ventilation, pneumonia, and aspiration are all definite possibilities (aggressive extubation attempts should be avoided).
C. Pregnancy – Women with this disease can experience increased weakness in the last trimester of pregnancy and early post-partum period. The choice of epidural over general is especially helpful in avoiding problems with respiratory depression and muscle relaxants.