Anesthesia and Surgery in Myasthenia Gravis Patients

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Myasthenia gravis (MG) is an autoimmune disease caused by abnormal immune reaction directed against acetylcholine receptors or other proteins of the neuromuscular junction. As the result of neuromuscular transmission impairment, MG leads to weakness of eye movements (droopy eyelid, double vision), limb muscle weakness, swallowing difficulty, and breathing impairment. MG is also characterized by a fluctuating course and MG patients often have deterioration of symptoms when they are exposed to certain medications, and stressors such as infections, pregnancy, and surgical procedures.

MG exacerbation or crisis (i.e., life threatening respiratory impairment) may arise from the stress of the surgical procedure or as a result of general anesthesia. General anesthesia may cause MG exacerbation or crisis because:

i. Neuromuscular blockers (NMB) that are commonly used in general anesthesia further suppress neuromuscular transmission, which is already impaired in MG;
ii. There is a possibility of drug interaction between medications commonly used in MG patients (pyridostigmine and azathioprine), and certain anesthetics and NMBs. For example, pyridostigmine blocks the enzyme that is involved in the metabolism of some of the NMBs, therefore prolonging the duration of their action (muscle weakness).

Given the potential for MG exacerbation or crisis after surgical procedures, it is critically important to take appropriate measures to avoid or minimize the occurrence of these complications. The following measures are recommended:

The neurologist is to be informed when a surgical procedure involving general anesthesia is scheduled. On the other hand, minor surgeries or procedures such as colonoscopy generally do not pose a high risk of MG exacerbation.

i. Elective surgeries (including thymectomy) are optimally to be planned when MG is in clinical remission. Patients with active MG and borderline pulmonary function, or those with history of MG crisis after surgical procedures may benefit from a protective course of treatment with either intravenous immunoglobulin (IVIG) or plasma exchange prior to undergoing the surgical procedure.

ii. Anesthesia complications can be minimized by avoiding NMBs and if patients receive NMBs, close monitoring in the postoperative state. Some anesthesiologists have used medications that promptly reverse the effects of NMBs in the immediate post-operative period.

iii. Depending on the circumstances, pyridostigmine may be withheld hours prior to the surgery and started in the recovery period.

iv. Furthermore, use of local and epidural anesthesia is preferred to general anesthesia in MG patients when possible. On the other hand, postoperative pain is to be treated aggressively as the stress caused by pain itself may potentially cause exacerbation of MG.

Reference: Blichfeldt-Lauridsen L, et al. Anesthesia and myasthenia gravis. Acta Anaesthesiol Scand 2012; 56: 17–22