DENTISTRY AND MYASTHENIA GRAVIS

The authors prepared this article for MG patients to give to their dentist. It is a compact but comprehensive review of the illness, and covers various aspects which are unique to the appropriate dental care of the myasthenic patient.

Dentistry can be a part of normal health care for the myasthenic and should not be feared or avoided. The objective of this article is to give both the dentist and the myasthenic a basis for understanding and communication that will result in good dental health and the prevention of future major problems.

BASIC PROBLEM: Myasthenia gravis (MG) presents as a neuromuscular disorder characterized by progressive weakness and fatigue of the voluntary muscles and made worse with exercise and relieved by rest. MG is believed to be an autoimmune phenomenon with a reduction of acetylcholine (Ach) receptors at the neuromuscular junction. Muscles contract when Ach from the motor nerve axon vesicles interact with the Ach receptor of the postsynaptic area on the muscle, causing depolarization and contraction of muscle. Ach is hydrolyzed by acetylcholinesterase (Ach E) after the depolarization. A process, activity, or drug that interferes with any of these steps will result in a decrease in response of muscle to stimulations resulting in weakness. Most myasthenics have elevated amounts of antibodies that bind to Ach receptors. Therefore, a reduction of Ach receptors is believed to be the basic problem in MG. The dentist and staff should first understand that the myasthenic does not have a contagious disease and is not a threat to staff or other patients.

CLINICAL FINDINGS: MG most often affects other muscles innervated by the cranial nerves, in women more frequently than men (3:2). Any age group can be affected but is notable for women in the 20s and 30s and men in the 50s and 60s. Many, but not all, myasthenics experience eye problems (ocular muscles) such as droopy eyelids (ptosis), double vision (diplopia), blurry vision, and weakness of eyelid closure. Some may experience difficulty swallowing and chewing and slurred speech (laryngeal and pharangeal muscles) and weak neck (head holding) muscles.

There may be weakness or abnormal fatigue of the proximal muscles of the arms (especially) and legs. Although about 16% of myasthenics have symptoms restricted to the eyes, the majority have involvement of oropharyngeal and limb muscles. Partial remissions sometime occur. Some (5%) myasthenics have thyroid dysfunction. Weakness will often increase with hot weather, fever, systemic illness, infections, exercise, a hot bath, stress, menstrual cycle, and drugs that display a neuromuscular blocking effect. Myasthenics often experience frustrations in getting diagnosed with fluctuating symptoms that are dismissed as a psychiatric problem. Diagnosis is eventually made with the demonstration of: fatigue on muscle testing; improvement after giving an anticholinesterase drug; repetitive nerve stimulation tests; and antibodies to the acetylcholine receptor.

MEDICAL TREATMENT: The standard anticholinesterase drug for MG is Mestinon (pyridostigmine) although there are several others. Few patients experience complete relief and may find that medication requirements vary during the day or from day to day. The most common side effects of inhibitors are gastrointestinal. Some patients may also have an increase in bronchial secretions, bronchospasm, oropharyngeal weakness, or respiratory insufficiency. Some MG patients take corticosteroids (prednisone) and commonly have had the thymus gland removed (thyme tome), sometimes including a thymoma. For severe situations, plasma exchange (plasmapaheresis) may give temporary improvement to avoid respiratory assistance.

DENTAL TREATMENT: The controlled myasthenic is able to tolerate productive dental sessions with some modest accommodations from the dentist (and staff) and with planning and cooperation from the patient.

Appointments: Usually morning appointments will work best, depending upon when the patient is at his/her best. It will help for the patient to take medication so there will be optimal oral and neck strength for the dental appointment. Patient and the dental staff should cooperate on appointment scheduling and patient should plan on being rested to the greatest extent possible so there is less chance of needing to cancel the session.

The patient should allow time to arrive and rest a bit. In hot weather it will help to arrive and refresh in the air conditioned office. The myasthenic is more susceptible to infection, especially if taking immuno-suppressant drugs or prednisone. Bring the patient back to a dental chair to relax a few minutes rather than sitting in the waiting room closely with others. The patient can take comfort in knowing that modern dentistry embraces "universal precautions". Dentists and assistants routinely wear gloves and masks before starting intraoral procedures.

All equipment and supplies should be previously set up and organized so the procedure can be efficient and productive. Appointments should usually avoid long sessions. For example, if several crowns were being prepared, temporary coverage should be made and impressions deferred to another appointment, if the patient becomes fatigued.

History: The amount of treatment, chair position, and head support can be planned based on the patient's problems, if any, with swallowing, holding head up, breathing, or choking. Some may have no problem at all, others a severe problem. Severe or uncontrolled cases and those on life support will usually be best treated through hospital dentistry programs or special patient care programs in larger health centers and dental schools.

Chair Position: Usually it is more difficult for the myasthenic to lie way back. It may help to be more upright to avoid closing the throat or regurgitating fluids. The dentist and patient need to find a compromise that can be tolerated by the patient yet give adequate access to the mouth to permit proper and safe dental treatment. The patient may

wish to try a small neck pillow to support the head. However, most modern dental chairs are contoured and have adjustable cup-shaped head rests that support the head.

Procedures: A chairside assistant is highly recommended using a good oral evacuation suction and a hand-held, self-directed, evacuation ejector to remove saliva and water. Rubber dam tooth isolation is very helpful whenever possible. The tooth is on the dentist's side and the patient can move the tongue and saliva ejector around on the other side without worry about choking or aspirating. Root canals can be done as well as restorations and crowns. Use a rubber mouth prop if it is difficult to keep the jaw open but periodically remove it for a rest break and don't over-stretch the mouth. (The dentist and assistant should try a mouth prop themselves for a more realistic concept of limits.) A pediatric-sized handpiece may be used for posterior areas with limited access.

Attitudes: Everyone will do better trying to accommodate the situation. Positive reinforcement gets most patients to go "the extra mile" and try to tolerate the procedure rather than intolerance, rushing or impatience.

Dentist and patient should cooperate on moderating costs. Most dentists experience high overhead costs. But the myasthenic does also, often having major medical costs and needing special transportation or facing extra visits to accomplish a procedure.

Anesthetics and Medications: Local anesthesia is much preferable to general anesthesia for the myasthenic. Fortunately, most routine dentistry is done with local anesthesia. There is no contra-indication to nitrous-oxide with oxygen for light sedation. Lidocaine ("xylocaine" and other brands) may exacerbate MG intravenously but should not be ruled out locally if needed. Mepivocaine ("carbocaine") has few side effects, has shorter duration and is a good first choice. Use anesthetic vasoconstrictors if needed to get adequately lasting and profound anesthesia. Vasoconstrictors may need to be avoided if the patient reacts unfavorably, as with some non-MG patients. An aspirating syringe for local anesthetics should be the standard of care with dental local anesthetics. No one thrives on pain or stress. Avoid bilateral mandibular blocks due to swallowing problems. Match the anesthesia to the procedure and have patient remain in the chair until swallowing control no longer needs suction or saliva ejector assistance and the patient feels in control. Some patients find intraligamental injection adequate for very localized anesthesia. However, this only lasts a short time and is contraindicated for a tooth with periodontal disease.

The dentist should contact the patient's physician for concurrence on use of antibiotics or sedatives. Prednisone or immuno-suppressants may result in easier infection or healing taking longer. Drugs that may exacerbate MG include (but are not limited to) intravenous lidocaine, aminoglycoside antibiotics (gentamicin, streptomycin, etc.), polypeptides, tetracyclines (Aureomycin, Achromycin, etc.), clindamycin (Cleocin), ampicillin, erythromycin (E-Mycin, Erythrocin) and diazepam (Valium). Every MG patient does not react to all these medications and no drugs are absolutely contra-indicated, but certainly any potential to impair neuromuscular transmission must be

weighed against the need to treat the disease or problem. Establish close monitoring and effective communications with the MG patient taking medications.

Surgery: Most oral surgery and periodontal surgery is done under modest amounts of local anesthesia. If intravenous sedation or a general anesthetic is necessary, then the myasthenic needs both an oral surgeon and an attending anesthesiologist. Both should be given the Myasthenia Gravis Foundation's Physician Manual and a list of medications that may aggravate MG. The oral surgeon cannot do the surgery and adequately tend to the myasthenic's general anesthesia and respiratory status. Any use of neuromuscular blocking agents will obviously require reparatory support and extended post-operative attention for the myasthenic.

Prevention: The best dentistry is prevention! Regular brushing with fluoride-containing toothpaste and cleaning between teeth with floss are extremely important even if difficult to do. Electric toothbrushes and floss holders are available. A very small "proxibrush" (looks like a miniature bottle brush) is made to clean under bridge pontics and where large spaces exist between teeth. When the brush wears out a new one can be mounted on the handles. These items are available without prescription in drug stores and supermarkets. Chlorhexidene ("peridex") or fluoride mouth rinse or gel are sometimes prescribed for periodontal (gum) and caries (decay) prevention and are acceptable for the myasthenic. Proprietary mouth washes do not take the place of brushing. Use a denture brush (or an electric toothbrush if necessary) to clean dentures or partial dentures inside and out. Lay them on a wet wash cloth in the sink to avoid dropping them and to make brushing easier. A dental "waterpick" will help get food particles from around braces and bridgework but brushing and flossing are unmatched for getting rid of the sticky film of bacteria and deposits known as plaque that causes caries and periodontal disease.

The myasthenic is urged to see the dentist routinely and stay on regular recall. Sometimes the occlusion may need adjustment if jaw muscles are especially weak. Small cavities and routine hygiene scaling of the teeth beats major restorations, abscesses, and extractions. Avoid emergencies. Modern dentistry has made big advances in techniques, materials, and treatment and is not the trauma that older persons remember from their childhood. Teamwork between patient, dentist, anesthesiologist (if needed) and the MG-treating physician means good, routine dental maintenance with minimal risk!

REFERENCES

Keesey, J.C. and Sonshine, R.: A Practical Guide to Myasthenia Gravis, Myasthenia Gravis Foundation.

Myasthenia Gravis Physician's Manual, Myasthenia Gravis Foundation of America, Chicago, Ill.

Stoelting, R.K. and Dierdorf, S.F.: Anesthesia and Co-Existing Disease, 3rd Ed., 1993, 439-444, Churchill Livingstone, New York.

Stoelting, R.K. and Dierdorf, S.F.: Handbook for Anesthesia and Co-Existing Disease, 1993, 266-269, Churchill Livingstone, New York.

Katz, J., Benumof, J.L. and Kadis, L.B.: Anesthesia and Uncommon Diseases, 3rd Ed., 1990 615-622, W.B. Saunders Co. (Harcourt race Jovanovic, Inc.), Philadelphia.

Adams, S.L., Mathews, J., Grammer, L.C.: Drugs that may exacerbate myasthenia gravis. Ann Emerg Med, July 1984; 13: 532-538.