



PIC QUESTION OF THE WEEK: 6/05/06

Q: Is there any risk in using drugs such as fluoroquinolones in patients with myasthenia gravis?

A: Myasthenia gravis is an autoimmune disorder associated with the development of antibodies directed against nicotinic acetylcholine receptors (AChR) at the motor end plate. This impairs neuromuscular transmission and results in the classic signs and symptoms of muscle weakness characteristic of the disease. Clinical presentation most commonly includes drooping of the eyelids (ptosis), difficulty in swallowing and speech, unstable gait, weakness in the arms, hands, and fingers, change in facial expression, and difficulty in breathing. The degree of muscle weakness is highly variable. Some patients may be symptom-free for prolonged periods, while others frequently experience episodes of weakness. It is well established that some drugs may worsen the symptoms of myasthenia gravis. Agents such as d-penicillamine and interferon-alpha can stimulate the production of auto-antibodies against AChR and produce symptoms that may be indistinguishable from those of idiopathic disease. Some recent reports of statin-induced myasthenia suggest these drugs may also induce auto-antibodies directed at receptors in the neuromuscular junction. Botulinum toxin A inhibits acetylcholine release at the presynaptic motor nerve terminal and should be avoided. Neuromuscular blocking agents must be used cautiously during surgery in patients with this disease. Hundreds of drugs have been reported to produce weakness in myasthenic patients. The Myasthenia Gravis Foundation of America (MGFA) recommends avoiding administration of d-penicillamine, interferon-alpha, and botulinum toxin in patients with myasthenia. It recommends caution when using neuromuscular blocking agents, class 1A antiarrhythmics such as quinidine, procainamide, etc., select antimicrobials such as aminoglycosides and ciprofloxacin, beta- and calcium channel blockers, and radiocontrast media. There are a number of anecdotal reports of the exacerbation of myasthenia gravis in patients treated with fluoroquinolones. The most frequently cited compound is ciprofloxacin; however, there are occasional reports implicating levofloxacin, ofloxacin, norfloxacin, and pefloxacin. Episodes of weakness began within hours to a few days after institution of therapy or increases in dosage. Symptoms typically resolved one-two days after discontinuing treatment. Some authors suggest that the quinolone moiety may have a curare-like effect on the motor end plate. There are reports of increased weakness in myasthenic patients after administration of many other antimicrobials including macrolides, clindamycin, colistin, sulfonamides, etc. Aminoglycosides and ciprofloxacin are, however, currently considered by the MGFA to possess the greatest potential for producing these effects. Considering the widespread use of fluoroquinolones, it appears the frequency of this complication in myasthenic patients is uncommon. The reader is encouraged to refer to the MGFA reference on medications and myasthenia gravis cited below.

References:

- Myasthenia Gravis Foundation of America. Medications and myasthenia gravis (revised August 10, 2004). <http://www.myasthenia.org/drugs/reference.htm> (accessed 2006 May 31)
- Augustine JJ, Kellermann AL. Fluoroquinolones should be avoided in myasthenia gravis. *Ann Emerg Med* 2004;44:87-8.

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