

Drugs that may aggravate Myasthenia Gravis [cont'd]

General Anaesthetic Agents

For use only by anaesthetists

It is essential to let the anaesthetist know that MG is present, and that the anaesthetic takes place in a hospital that has an ICU with the ability to provide mechanical ventilation, should the need arise.

Neuromuscular Blocking Drugs

These are used to cause paralysis of muscles during an anaesthetic. On occasions this paralysis can be profound and last for days or weeks in a myasthenic. Must only be used when mechanical ventilation is possible.

Inhalation Anaesthetics

Can increase the effect of the neuromuscular blocking drugs used during the same operation.

Botulinum Toxin – Avoid use

It can have distant as well as local effects.

Interferon Alpha – Avoid use if possible

Use needs to be carefully considered on an individual basis.

Narcotics (eg Morphine) – Use with caution

General effects of narcotics may worsen MG. Cholinesterase inhibitors such as Pyridostigmine (Mestinon™) can increase the effect of the narcotics.

Local Anaesthetics – Can be used safely

eg Lignocaine (Xylocaine™) Bupivacaine (Marcaine™) etc

Magnesium

eg in laxatives, antacids, magnesium supplements. In renal failure, the magnesium levels can rise and cause muscle weakness, and myasthenics are particularly prone.

X-ray Examinations with Contrast

The newer, non-ionic contrast agents are safe to use.

A Note on Vaccinations

Live vaccines should be used with great caution if a patient's immunity is low due to immunosuppressive treatment. They do not have a direct effect on the MG itself. Inactivated vaccines are safe to use in MG.



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A brief guide for patients, doctors and dentists.

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It is strongly recommended that health professionals refer to the more detailed version of this guide at www.myastheniawa.info



Introduction

This pamphlet is a practical guide to drugs that may affect Myasthenia Gravis [MG]. Information is arranged under the heading of diseases or conditions to make it easier for the doctor or dentist to quickly see which drugs can be used.

The MG Support Group recommends that myasthenics discuss this pamphlet with their practitioner as MG is a disease in which it is particularly important to individualise treatment.

- Drugs may worsen MG by
- interfering with neuromuscular transmission. As MG also affects neuromuscular transmission, it may lead to worsening symptoms. The better controlled the MG, the less the risk of these drugs being a problem.
 - increasing muscle weakness in a more general manner, thus making the MG weakness more noticeable.

There are a few clear cut examples of drugs that can actually cause a temporary form of autoimmune MG which usually settles once the drug is ceased. It is less clear whether these drugs will worsen pre-existing MG.

The drugs in this list have been rated according to those which should be avoided if possible and those that can be used with caution. In deciding which drugs to use, there are other factors to take into account: eg. a drug may be essential, so will be used despite the likelihood of worsening the MG. On the other hand, a drug may be less likely to cause worsening of MG, but there will be other drugs which will do the job just as well, so it will be avoided.

Many reports of drugs affecting MG have caused problems in only a few people. The majority of MG patients can take the drugs without problems.

Be Alert!
It's important that patients and doctors be alert to the early signs of an exacerbation of MG when a new drug is commenced, even if it is not on this list.

LEGEND:

- ▲▲▲ Likely to worsen MG
Should only be used in a setting where ventilatory support in a hospital is available.
- ▲▲ May worsen MG but are usually tolerated.
Use with caution.
- ▲ Have caused problems in rare cases but are not a problem for the majority of people with MG.
- ▲ Have been shown to cause a temporary form of MG (autoimmune).

Drugs used in the treatment of Myasthenia Gravis:

Pyridostigmine (Mestinon™) and Neostigmine can aggravate the weakness if the dose is too high. More is not necessarily better.

Corticosteroids (eg. Prednisone, Prednisolone) Transient worsening of MG with high dose steroids (50mg/day or more) is common, but benefits outweigh disadvantages. Start with a low dose and build up if possible.

Drugs that may aggravate Myasthenia Gravis

Antimicrobials

- 1. Antibiotics.**
- ▲▲▲ Telithromycin (known as “Ketek” in the USA, UK and Europe) is not yet available in Australia. It stands alone in being the one medication that has been **contra-indicated** in MG and should **not** be used in any MG patient, even if their disease is well controlled. Another antibiotic should be used instead. Beware when travelling overseas, as this is an **oral** drug, and can therefore be given by a GP or as outpatient treatment.
- 2. The other antibiotics most likely to cause problems are only available as intramuscular and intravenous preparations (with the exception of clindamycin). They may need to be used for life threatening infections.**
- ▲▲▲ **Aminoglycosides**
Gentamicin, Amikacin, Tobramycin. (Kanamycin, Streptomycin and Neomycin are rarely used).
 - ▲▲▲ **Bacitracin and Polymixin**
Safe as topical preparations.
 - ▲▲▲ **Colistin**
 - ▲▲▲ **Clindamycin** (oral form available. Also available as skin lotion and vaginal cream, with appreciable systemic absorption), **Lincomycin**.
- 3. Use the following antibiotics with caution:**
- ▲▲ **Quinolone antibiotics.** Ciprofloxacin, Norfloxacin, Moxifloxacin, (topical preparations eg ear drops, unlikely to present a problem).
 - ▲▲ **Macrolide antibiotics** - Erythromycin/Azithromycin.
 - ▲▲ **Tetracyclines** - Doxycycline, Minocycline etc.
 - ▲ **Sulfonamides** (eg Septrin™, Bactrim™).
 - ▲ **Ampicillin** (little evidence of problems with other penicillins)

- ▲ **Primaxin™** (Imipenem) only available for intravenous treatment of serious infections in hospitalised patients.
- 4. Malaria treatment.**
- ▲▲ **Quinine family** – Chloroquine, Hydroxychloroquine, Quinidine.
- 5. Worming treatment.** Available without prescription.
- ▲ **Pyrantel** (Combantrin™, Anthel™, Early Bird™)

Cardiovascular Drugs

- 1. Class 1 Anti-arrhythmics:**
- ▲▲▲ eg **Procainamide, Lignocaine (IV)**
They should only be used in a hospital setting for life threatening arrhythmias when there are no alternatives.
 - ▲▲▲ **Quinidine** – has largely been superceded.
- 2. Beta Blockers:**
- ▲▲ There are many in this class, often identifiable by the “lol” ending eg **Atenolol** (Noten™, Tenormin™), **Metoprolol** (Betaloc™, Minax™) etc.
- 3. Calcium Channel Blockers:**
- ▲▲ **Verapamil** (Veracaps™, Isoptin™). Documented case of worsening MG with this drug. Use others in class with caution.
- 4. Cholesterol lowering drugs:**
- ▲▲ **Statins** eg. Simvastatin (Lipex™), Atorvastatin (Lipitor™), Pravastatin (Pravachol™). Benefits in established IHD usually outweigh the risks.
- 5. Alpha Blockers:**
- ▲ **Alpha Methyldopa** (Aldomet™, Hydopa™)
- 6. Diuretics:**
- Monitor potassium as low levels can increase muscle weakness.

Rheumatic Disease

- ▲ **Penicillamine** – Use with caution.
- ▲▲ **Chloroquine (Chlorquin™), Hydroxychloroquine (Plaquenil™)** – Avoid use if possible.

Thyroid Disease

- ▲ Hyperthyroidism or excess thyroid hormone replacement can worsen MG.

Anti Epileptic Drugs (Anti Convulsants)

- ▲▲ **Phenytoin** (Dilantin™). Avoid use if possible
 - ▲ **Trimethadione** (rarely used now)
- Use the following agents with caution:**
- ▲ **Barbiturates.**
 - ▲ **Ethosuximide** (Zarontin™) and **Carbamazepine** (Tegretol™).

Drugs Used in Psychiatry

- ▲▲ **Lithium** – Use with caution.
It is common for Lithium to cause weakness, even in people without MG. It usually improves within 2 – 4 weeks.
- ▲▲ **Chlorpromazine** (Largactil™) Avoid use.
The newer anti-psychotic medications appear to be safer, but use them with caution.
- ▲ **Benzodiazepines** eg Diazepam (Valium™), Oxazepam (Serepax™), Temazepam (Normison™, Temaze™). Use with caution if respiratory function compromised.

Anti Spasmodics

- ▲▲ eg **Propantheline, Oxybutinin, Atropine, Buscopan**
These are anti-cholinergics, and have the opposite effect to Pyridostigmine (Mestinon). For this reason they may be marked as contra-indicated in the drug company literature. However, they work on different receptors and for many myasthenics they do not seem to cause problems at normal dosages. Nevertheless, a few do experience significant worsening of symptoms. Propantheline and Atropine are used for side effects of Mestinon (bowel cramps).

Ocular Drugs (Eye Drops)

- ▲▲ **Acetazolamide.**
- ▲▲ **Proparacaine/tropicamide.**
- ▲▲ **Beta Blocker eye drops**
eg Betaxolol (Betoptic™, Betoquin™), Timolol (Tenopt™, Timoptol™).
- ▲▲ **Ecothiophate**