

**Dr Rajesh Munglani** MB. BS. DA. DCH. FRCA. FPPMRCA  
**Consultant in Pain Medicine**

Spire Cambridge Lea Hospital  
30 New Road  
Impington, Cambridge CB24 9EL  
Appointments: 01223 266990/266995

BMI Healthcare Hospital  
St Mary's Square  
Bury St Edmunds, Suffolk IP33 2AA  
Appointments: 01284 701371

Nuffield Health Cambridge Hospital  
4 Trumpington Road  
Cambridge CB2 8AF  
Appointments: 01223 479024

**All Enquiries/Correspondence to:**

**Sue Sanalitra, PA to Dr R Munglani, Spire Cambridge Lea Hospital (address given above)**  
Tel/Fax: 01223 479024/479125 Email: sue.sanalitra@googlemail.com

**The use of Botulinum Toxin in the treatment of chronic spinal pain  
and including headaches and migraines**

**Dr Rajesh Munglani  
Consultant in Pain Medicine**

The word Botulism is associated with food poisoning and death from muscle paralysis. The infective agent, *Clostridia Botulinum*, produces a toxin which causes the paralysis and is known as **Botulinum toxin**<sup>i</sup>. It is this toxin, rather than the bacteria, which causes the muscle paralysis, although the toxin itself is not infective. Botulinum toxin has also been used as a biological weapon so it does seem rather extraordinary that this substance is now being hailed as an exciting new treatment for chronic pain<sup>ii</sup>. To understand why this so, one needs to understand a little more about this substance and also the role of muscle spasm in causing chronic pain.

Botulinum toxin was separated by purification methods developed by Schantz. There are now five recognised immunogenic subtypes labelled A to E and if a patient develops antibodies to one subtype, it is theoretically possible to offer them another. In San Francisco, Scott pioneered work on treating strabismus with botulinum toxin and published the results of the first human studies in 1981. The clinical safety of this drug given in appropriate amounts has been supported by this long history of use.

**Muscle spasm as a symptom of disease processes and leading to chronic pain**

Many conditions are known to be associated with muscle spasm or irritability such as cerebral palsy and facial and eye tics, and it was suggested long ago that botulinum toxin, if given in *minute doses*, may be helpful in such cases. Indeed, since the 1980s the use of botulinum toxin for these and related conditions has rapidly increased.

During this period, it has been observed that, as well as relieving muscle spasm and irritability, the toxin can bring pain relief. On this basis, Botulinum toxin has been injected into painful spasmodic muscles in patients with intractable neck and back pain; these individuals reported relief of symptoms.

Muscles that are frequently implicated in neck and back pain and have been reported respond to treatment with botulinum toxin are listed in table 1. The list is by no means exhaustive. Physical therapists (including physiotherapists, osteopaths and practitioners of chiropractic), acupuncturists and practitioners of intramuscular stimulation, and those who use the techniques of Travell and Simons will recognise these muscles as ones they frequently work on to reduce muscle spasm. In my experience, the clinical identification of such muscle groups in the pathogenesis of intractable pain, and failure to respond to other conservative therapy, is an indication for possible treatment with botulinum toxin.

**Table 1: Muscles commonly associated with intractable neck and back pain which have been reported to respond to injections with botulinum toxin.**

Neck pain, Headaches, Migraines	Splenis Capitis Splenis cervicus Semisplenis Capitis Sternocleidomastoid Scalenes Levator scapulae Trapezius
Back and Loin Pain Buttock pain Hip pain Upper leg pain	Multifidus Longissimus Iliocostalis Quadratus Lumborum Psoas, iliopsoas Gluteus Piriformis

I have found that patients with persistent back or neck pain linked to with muscle spasm often respond to treatment with botulinum toxin when they have failed to respond to back surgery or interventional pain procedures such as epidurals, lumbar or cervical facet denervation.

Studies using botulinum toxin in intractable myofascial pain are continuing and show promising results. They indicate that in appropriately selected patients an injection of botulinum toxin may give 3-15 months relief in 50% of patients, particularly for head and neck pains<sup>iii</sup>.

There are two formulations of botulinum toxin widely available on the market: Botox A® (Allergan) in 100iu/vial, and Dysport® (Ipsen) in 500iu/vial. Though they both measure activity in international units they are *not* interchangeable regarding of dose and care should be taken when changing between the two.

## FREQUENTLY ASKED QUESTIONS

### **How does botulinum toxin work?**

Botulinum toxin works by binding the nerve-muscle junction, thereby stopping the nerves causing muscle contraction. The muscle then relaxes resulting in reduced resting tone and response to nerve stimulation. This effect usually occurs around two to four weeks after the injection. The nerve is able to stimulate the muscle again within two months or so, but the effect of the treatment on the pain may last much longer<sup>iv</sup>—see *below*.

### **Does the injection have to be repeated? If so, how often?**

The simple answer is yes. The effect of the injection is not permanent, but if a cycle of pain and spasm is broken, the relief may last a very long time – a year or more once an adequate dose has been given. This often requires two injections separated by a period of a month or so. (See *below*.) The effect of botulinum toxin seems to be augmented if the patient has physical therapy or acupuncture /intramuscular stimulation<sup>v</sup> to the area afterwards<sup>vi</sup>.

### **How safe are the injections?**

The dose of botulinum toxin required for effect is minute and it has to be injected exactly where it is needed. Around 5% of an injected dose will spread from the local site of injection through the body, causing some patients to feel washed out or “fluey” for a week or two. Swallowing difficulties or problems with voice production have been reported if the toxin is injected near the muscles controlling voice or swallowing, or if larger doses are used<sup>vii</sup>. I have carried out hundreds of injections for musculoskeletal pain (including neck and back pain) and the sensation of feeling washed out for a week or two is the only side effect I have seen (in about half the patients injected). I usually recommend that no more than one vial of botulinum toxin is given per session to a normal adult patient and that a period of at least a month passes before further treatment. This approach probably accounts for the lack of major side effects seen in my clinic. Obviously, performing *any* injection does carry some risk, hence this procedure should be discussed with, and performed by, a doctor who specialises in this type of treatment for pain.

### **How can I tell if my pain is suitable for this treatment?**

The pain types which are suitable for this treatment include those where muscle spasm and tenderness are clearly definable. I often try a simple injection of local anaesthetic and steroid into the area first, and if this works but wears off, a trial of botulinum toxin may be appropriate.

### **I have had a) many epidurals, b) facet joint blocks c) back surgery d) fusion surgery for my spinal pain. Could these botulinum toxin injections help me?**

If the pain is localised and, particularly, if the patient responds to the simple local anaesthetic and steroid injections indicated above, it may be worth a try. As botulinum toxin injections tend not to bring permanent relief, surgery or interventional pain procedures may be offered first since these may bring longer lasting benefits. However, as botulinum toxin injections have few side effects in the doses used for pain (and as evidence for their effectiveness accumulates), they are more likely to be offered before the major procedures in the future.

**I have shooting pains down my arm/leg. I have been told nothing further can be done for me. Will botulinum toxin injections help?**

Shooting pains of the sharp/burning type tend to suggest that there has been nerve damage and botulinum toxin is not usually helpful here. Botulinum toxin is much more useful for treating aching, cramping, pains associated with muscle spasm.

**I have been told I have fibromyalgia and have widespread muscle pain all over my body. Will botulinum toxin help me?**

The few studies done into fibromyalgia suggest that botulinum toxin treatment has a lower success rate here<sup>viii</sup>. Fibromyalgia is considered to be a problem in the way that the nervous system copes with pain; in such cases, there may not be sufficient muscle spasm to treat. Having said that, my experience shows that, if the condition started after an acute injury such as whiplash, the original site of injury may respond and the other, more widespread symptoms may then reduce.

**I have intractable headaches/migraines associated with neck pain. Can these injections help me?**

Treatment of head and neck pain, including migraines and whiplash type neck pains<sup>ix</sup>, with botulinum toxin is one of the most exciting areas of this treatment<sup>x,xi</sup>. The results of treatment of intractable head and neck pain, including cervicogenic headaches and migraines seem to be very good, better, in fact, than the results for back pain. This may reflect the smaller volume of muscle that needs to be treated for neck pain compared to back pain. The effectiveness of this type of treatment suggests that muscle spasm and pain may contribute to some recurrent headaches and migraines. Again, discussion with an appropriate specialist is important.

**Can I obtain this treatment on the NHS?**

Botulinum toxin is used on the NHS for treatment of spasm associated with cerebral palsy etc. as described above. Despite the increasing evidence for its use in myofascial pain, it is not yet licensed for this indication and not widely available, if at all, on the NHS for myofascial pain. The drug is expensive and this also limits availability on the NHS.

**I have heard that this drug is used for treating wrinkles?**

The use of minute doses of botulinum toxin in treating wrinkles has shown to be very effective, but again, this treatment is not permanent. Interestingly the site of injections of wrinkles, especially on the forehead often corresponds to sites where headaches are felt and some patients noted that their wrinkles as well as their headaches improved with treatment.

**Are there any contraindications?**

Botulinum toxin should not be given in pregnancy, disorders of neuromuscular transmission, including myasthenia gravis, or eaton lambert syndrome. I avoid giving it to anyone who considers themselves to be significantly affected by ME, although there is no evidence that it affects the natural history of this condition.

**Botulinum toxin is a novel treatment which may afford some relief for some intractable pain. It is not suitable for all pain and discussion with a specialist must be undertaken before treatment. Dr Rajesh Munglani is Consultant in Pain Medicine at the West Suffolk Hospital, Bury St. Edmunds. He was formerly a lecturer in the University of Cambridge and also was made The John Farman Professor at the Royal College of Anaesthetists for his research on chronic pain. Further information on botulinum toxin can be obtained by phoning Dr Munglani's secretary on 01223 266927.  
Email : rajesh@munglani.com**

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<sup>i</sup> Aoki, R. The development of Botox its history and pharmacology. Pain Digest 1998;8:337-341

<sup>ii</sup> Dressler D Botulinum toxin therapy.. Thieme press. Stuttgart Germany 2000.

<sup>iii</sup> Alo et al. Botulinum toxin in the treatment of chronic pain. Pain Clinic 1997;10:107-116

<sup>iv</sup> Porta, M. The rationale and results of treating muscle spasm and myofascial pain syndromes with botulinum toxin type A. Pain Digest 1998;8:346-352.

<sup>v</sup> Gunn, CC. Treatment of Chronic Pain. Churchill Livingstone.1997

<sup>vi</sup> Childers MK. Use of Botulinum toxin type A in pain management. Academic Information Systems. Columbia, Missouri. USA 1999

<sup>vii</sup> O'Brien CF. Clinical applications of botulinum toxin: Implications for pain management. Pain Digest 1998;8:342-345

<sup>viii</sup> Prithvi Raj, P. Botulinum toxin for the treatment of pain. Pain Digest 1998;8:335-336.

<sup>ix</sup> Freund, B.J., Scwartz, M. Treatment of whiplash associated with neckpain with botulinum toxin-a: pilot study. The Journal of Rheumatology 2000;27:481-484. <sup>ix</sup> Aoki, R. The development of Botox its history and pharmacology. Pain Digest 1998;8:337-341

<sup>x</sup> Porta, M. A comparison trial of botulinum toxin type a and methylprednisolone for the treatment of tension-type headache. Pain Digest 1999;9:303-306

<sup>xi</sup> Silberstein, S. et al Botulinum toxin type A as a migraine preventative treatment. Headache 2000;40:445-50