

Initially introduced as a treatment for squint (strabismus), Botox injection is now a widespread cosmetic treatment used to disperse signs of ageing.

However, it has also been used to reduce symptoms in conditions such as torticollis, blepharospasm and spasticity and as a measure of pain relief when the pain is due to muscle spasm.

BTX is produced by the microorganism *Clostridium botulinum*. Licensed products Dysport ? and Botox? type A toxins are licensed for blepharospasm, spasmodic torticollis and treatment of a foot deformity called equines which occurs in people with cerebral palsy from the age of 2 years.

Botox? is also licensed in places like Switzerland for treatment of lower leg spasticity in children with cerebral palsy aged 2-12 years and adults with acquired spasticity due to nervous system disorders including stroke.

The technique makes use of the neurotoxic properties of the botulism toxin, to paralyse local areas of muscles by its effect on the neurotransmitter acetylcholine.

The result is a reduction in muscle contraction and a dose-dependent weakness and atrophy. The extent of denervation depends upon the dose and volume of the injection.

The effect, which may be delayed initially, setting in 24-72 hours after injection, lasts 2-6 months, and is terminated by axon sprouting.

However, this raises the question of abnormal sprouting which has been shown in the past to be

implicated in severe pain after nerve block, due to sideways sprouting, causing *anaesthesia doloureux*.

The weakness and muscle atrophy tend to resolve over 3-4 months during which time there is formation of new rudimentary nerve-muscle synapses, which then regress once the original neuromuscular junction has recovered.

Obviously this means that injections need to be repeated to have a lasting effect.

Lang, at the Department of Rehabilitation Medicine, Emory University School of Medicine and Hospitals, Atlanta, USA, has written on the use of BTX in myofascial pain syndrome ([\[1\]](#)) and chronic pain syndrome (

[\[2\]](#)

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Lang suggests

“the underlying problem in many types of muscle pain disorders is a distortion of critical structures that causes functional deficits and pain. An objective of treatment is to reverse this distortion, enabling repair of damaged tissues and strengthening of weakened muscles.”

BTX helps to reduce heightened muscle tone and overactivity, and may therefore be a useful part of an overall treatment approach that includes physical therapy to help restore normal muscle length and biomechanical balance to improve the prospect of ensuring long-term relief from associated pain.

Difazio and Jabbari recently suggested ([\[3\]](#)):

“Botulinum toxin, which has already been shown to alleviate pain associated with cervical dystonia and other conditions characterized by muscle spasticity, is now being studied for the treatment of back pain. Preliminary evaluations have shown that this treatment is safe and has the advantage of providing local relief directly to the site of injury or pain, without causing systemic side effects. Initial data from small trials also suggest that botulinum toxin is effective,

alleviating back pain in selected patients."

It is, however, important to remember that as yet, longer-term effects have not been evaluated and further research into safety and efficacy are needed.

Most adverse effects tend to be transient and localised and include: local muscle weakness, dysphagia (trouble swallowing), ?flu-like symptoms for up to a week, rash and brachial neuritis (the last is not self-limiting). Side -effects tend to peak at 2-4 weeks after the injection. The same dose and pattern of injections may produce variable results, so that side effects may occur despite trouble free injections in the past.

After repeated treatments, resistance due to antibodies to the toxin may develop. Longer term consequences include muscle weakness and atrophy. Systemic adverse effects are unlikely but remain a possibility in certain vulnerable patients, so this form of treatment is relatively contraindicated in patients with neuromuscular disease.

[1] Lang AM *Current Pain and Headache Reports* 2002; 6: 355-360 Botulinum toxin therapy for Myofascial Pain Disorders

[2] Lang AM. *Arch Phys Med Rehabil* 2003 Mar; 84(3 Suppl 1):S69-73; Botulinum toxin type A therapy in chronic pain disorders.

[3] Difazio M, Jabbari B. *Clin J Pain* 2002 Nov-Dec; 18(6 Suppl):S155-62 A focused review of the use of botulinum toxins for low back pain.