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BOTULINUM TOXIN AS A DIAGNOSTIC TOOL IN CHRONIC CERVICAL WHIPLASH

B. Freund BSc, DDS, MD, FRCDC, University of Toronto, Toronto, Ontario, Canada
M. Schwartz BSc, DDS, MSc, University of Toronto, Toronto, Ontario, Canada

PURPOSE: There is at present no consensus as to the anatomic or physiologic derangement causing chronic whiplash associated disorder. Acute therapy is aimed at the musculoskeletal complex of the neck. Most frequently, this takes the form of anti-inflammatories, muscle relaxants, skeletal manipulation or physical therapy targeting the cervical muscle groups. The recovery rate from acute injury is excellent but does not correlate well with any specific type of intervention. Chronic cases do not respond well to any therapy with the possible exception of percutaneous radiofrequency neurotomy and Botulinum toxin (BTX) injections. The evidence supporting the efficacy of these latter therapeutic interventions is at present very limited.

The purpose of this pilot study was to see whether BTX could be effective in identifying cases of chronic whiplash associated disorder which are primarily myogenous in nature. Identification of the appropriate target tissues would be the first step in providing effective therapy.

METHODS: This randomized, double-blind, placebo controlled trial compared outcome measures in 24 subjects suffering from chronic neck pain (WAD-II chronic) subsequent to a motor vehicle accident. One half of the patients received 100 units BTX-A, diluted in 1ml of saline while the other half received just saline (1 ml). Five trigger points clinically representing the most tender cervical muscular areas, received 0.2 ml each of injectant via a 30 gauge needle. Primary outcome measures included a 50% reduction in subjective neck pain based on visual analogue scales and objective total range of neck motion (ROM). Follow-up assessments were carried out at 2 and 4 weeks post treatment.

RESULTS: The placebo group showed no improvement in pain or ROM at 4 weeks as compared to baseline. In the treatment group, 7 of 12 subjects responded with a 50% or greater improvement in subjective neck pain. A strong positive correlation was found between subjects who responded subjectively to BTX-A injections and increased ROM. Within the treatment group the seven responders improved with a mean increased ROM of 36% whereas the non-responders within the treatment group improved by a mean ROM of 7%.

DISCUSSION: BTX is a pre-synaptic neurotoxin, which causes dose-dependent weakness or paralysis in skeletal muscle by blocking the release of acetylcholine from motor nerve endings. This acts to functionally denervate the affected portions of the muscle. The primary effect is on alpha motor neuron function but may also effect the gamma motor neurons in the muscle spindles, lowering resting tone. No other physiological function has been assigned to BTX-A at the present time.

These findings suggest that in over half of the treatment group, the cervical musculature alone appears to be the common element relating chronic neck pain and decreased ROM. BTX-A may therefore be a useful diagnostic tool in identifying those cases of chronic neck pain that are principally myogenous in nature.