

Temporal relationship of muscle weakness and pain reduction in subjects treated with Botulinum toxin A

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Background: The mechanism by which Botulinum toxin A (BTX-A) reduces pain in patients with myogenous or myofascial conditions is assumed to be due to muscle relaxation. However, many anecdotal reports suggest that the degree and duration of pain relief is more profound than can be explained by muscle relaxation only.

Methods: 35 subjects with a diagnosis of muscle-centered temporomandibular disorder were enrolled in this prospective open label study. Each subject was injected under EMG guidance with 150 units of BTX-A diluted in 1.5 ml of saline. The temporalis muscles received 25 units each and the masseters 50 units each. Subjects completed a visual analogue scale for facial pain as well as recordings of maximum voluntary bite force every two weeks for a total of 10 weeks.

Results: All subjects developed weakness in their chewing muscles after injection which paralleled their reduction in subjective pain. By week 4 post-injection the maximum weakness was recorded, but the pain index continued to decrease. By the 8th week muscle power had returned to pre-injection levels but subjective pain continued to show a marked decrease from initial levels (see Figure 1). No adverse effects were reported.

Discussion: Initially the muscle weakening effects and the pain relieving effects of BTX-A are temporally closely related. However, by two months post-injection muscle strength returned and pain inhibition is still very evident. This further supports the premise that reducing muscle tone does not cause a reduction in pain in this myofascial condition. It may also suggest that different physiologic mechanisms are influenced by BTX-A independently.

Figure 1.

