



INJECTED BOTULINUM TOXIN A MEDICATION APPEARS TO REDUCE SEVERE ABNORMAL EXCESSIVE MUSCLE TONE

Spasticity Research Abstract

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The Question: Does injected botulinum toxin A medication (BTXA) reduce severe abnormal excessive muscle tone (“spasticity”) caused by injury to the brain?

Past Studies describe the successful use of botulinum toxin A (BTXA) for persons with spasticity. “Spasticity” is a term used to describe a condition that causes muscles to be stiff and resist stretch. As a result of injury to the brain, spastic muscles are unable to “relax” or “stretch out.” Because of this, persons with spasticity may not be able to straighten out or bend their arm or leg joints, even if they have the strength to do the task. For instance, the muscles necessary to straighten the arm may actually be working, but if the muscles that bend the arm are spastic, they can be so powerful that individuals cannot overcome the force generated by the spastic muscles and are unable to straighten their arms. When spasticity limits a person’s body movements, it can decrease functional abilities and also can lead to medical problems such as pain, sleep disturbances, and skin conditions. Spasticity can be treated for some people. Many spasticity medications have been tested over the years.

Some anti-spasticity medications can be delivered by injection into specific muscles. When injected into the muscle’s nerves, the medication causes a disconnection between nerves and the muscles. This results in weakening of the spastic muscle. Once the spasticity has been relieved, the limb has potential for free movement. Injected medications typically act at the sight of injection, therefore minimizing medication side effects throughout the body. There are several anti-spasticity medications that can be injected, but few studies have included persons with traumatic brain injury.

This Study examined the use of Botulinum Toxin A (BTXA), an injectible medication, as a treatment for persons with spasticity as a result of traumatic brain injury. Participants included 21 adults with traumatic brain injury and severe spasticity involving the wrist and finger muscles. The participants in this study demonstrated unsatisfactory responses to other spasticity treatments.

The participants were treated with BTXA and studied for a year. Selected finger, wrist, and elbow muscles were injected with BTXA. After injection, participants received therapies, splinting, and casting as necessary. If oral antispasticity medications were administered, dosage was not changed before or after BTXA injection.

In this study, BTXA used with clinical therapy appeared to be highly effective at reducing spasticity in the wrists, fingers, and elbows of persons with traumatic brain injury. Increased doses of BTXA appeared to increase the length and intensity of response. The treatment effect lasted for up to 5 months, and averaged approximately 12 weeks for most participants. The treatments were well tolerated by the participants.

Who May Be Affected By These Findings: Persons with traumatic brain injuries and spasticity, family and caregivers, health care professionals, researchers.

Caveats: Assumptions about BTXA use on other muscle groups should not be made by the results of this study. This study may have limitations.

Bottom Line: In this study, Botulinum Toxin A used with clinical therapy appeared to be highly effective at decreasing spasticity in the wrists, fingers, and elbows of persons with traumatic brain injury. Increased doses appeared to increase the length and intensity of response. Future research will determine dosage amounts, risk factors, long-term effectiveness, and the usefulness to other muscle groups.

Find This Study: Yablon, S. A.; Agana, B. T.; Ivanhoe, C. B.; Boake, C. (1996). Botulinum toxin in severe upper extremity spasticity among patients with traumatic brain injury: An open-ended trial. *Neurology* (47), 934-944.