



Journal of Biological Sciences

ISSN 1727-3048

science
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Botulinum Toxin A Creates Muscle Weakness and Atrophy Following Long Term Use, Study Suggests

A new study by researchers at the Faculty of Kinesiology, University of Calgary, is raising questions about the therapeutic use of botulinum toxin A.

The study found that animals injected with Clostridium Botulinum type A neurotoxin complex (BOTOX, Allergan, Inc., Toronto, Ontario, Canada) experienced muscle weakness in muscles throughout the body, even though they were far removed from the injection site. The study also found that repeated injection induced muscle atrophy and loss of contractile tissue in the limb that was not injected with the Toxin.

"We were surprised by the degree of muscle loss and atrophy in the limb that was not injected with the Botulinum toxin," says Rafael Fortuna the Lead Author of the paper will soon be published in The Journal of Biomechanics, "I think it's fair to say that the paper raises some important questions about the long-term therapeutic use of Botox, especially with children and adolescents."

The study used dosages that approximated therapeutic doses used to treat conditions like cerebral palsy where muscle contraction can't be controlled resulting in muscle dystonia and spasticity. The study follows previous research in Dr. Walter Herzog's lab, which found that

Botulinum toxin A, easily crosses the muscle membrane barrier, resulting in muscles weakness in the surrounding (non-injected) muscles.

This study shows, for the first time, that over time Botulinum toxin A use also results in muscle weakness, atrophy and loss of contractile tissue in non-injected muscles far-removed from the injection site. "It may be that the benefits of using Botox for these kinds of therapeutic, medical uses, outweighs these potential long-term consequences," says Dr. Herzog, "however, I think this study raises some important issues that need to be followed to ensure the best possible outcomes for patients, in the long term."

Botulinum Toxin A is also used as a cosmetic treatment, where the drug paralyzes small muscles in the face to reduce the appearance of wrinkles.

Herzog notes that while this study was looking at larger doses, the results should be valid for any application of the drug.