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Does Vitamin B Alter the Efficacy of Botulinum Toxin?

Abstract

Botulinum toxin prevents acetylcholine release at motor nerve terminals. Group B vitamins (B-vit) are essential for proper nerve function. The present study addresses the question of whether B-vit accelerate recovery in rat skeletal muscle after botulinum toxin A (Btx-A) injection. Forty-four adult male Wistar albino rats were used in this experimental study. Rats were divided into three groups: group 1 rats were given Btx-A injection only, group 2 rats were given B-vit supplementation before Btx-A injection, and group 3 rats were given Btx-A and B-vit injections together. During the experiment, compound muscle action potential (CMAP) of the gastrocnemius muscle was recorded before Btx-A injection and sequentially ten times after toxin injection. The statistical significance of the CMAP amplitude change among the groups was analyzed. All groups showed similar amplitude change between consecutive measurement points. In conclusion, combining Btx-A injection with B-vit supplement does not decrease the efficacy of the toxin.

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Does Vitamin B Alter the Efficacy of Botulinum Toxin?

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Abstract Botulinum toxin prevents acetylcholine release at motor nerve terminals. Group B vitamins (B-vit) are essential for proper nerve function. The present study addresses the question of whether B-vit accelerate recovery in rat skeletal muscle after botulinum toxin A (Btx-A) injection. Forty-four adult male Wistar albino rats were used in this experimental study. Rats were divided into three groups: group 1 rats were given Btx-A injection only, group 2 rats were given B-vit supplementation before Btx-A injection, and group 3 rats were given Btx-A and B-vit injections together. During the experiment, compound muscle action potential (CMAP) of the gastrocnemius muscle was recorded before Btx-A injection and sequentially ten times after toxin injection. The statistical significance of the CMAP amplitude change among the groups was analyzed. All groups showed similar amplitude change

between consecutive measurement points. In conclusion combining Btx-A injection with B-vit supplement does decrease the efficacy of the toxin.

Keywords B vitamins · Botulinum toxin · Electromyography · Neuromuscular junction · Chemodenervation

Abbreviations

Btx-A Botulinum toxin A
B-vit B vitamins
CMAP Compound muscle action potential
EMG Electromyography

Botulinum toxin A (Btx-A) treatment has become one of the most common nonsurgical procedures performed by dermatologists and plastic surgeons as a part of anti-aging therapy. Cosmetically, Btx-A can be used on the entire face and neck to correct wrinkles, which occur due to hyperactivity of the underlying muscles. In addition, the agent can be used in the treatment of a variety of neurological diseases. Botulinum toxin causes weakness in the target muscle via inhibition of acetylcholine release at the motor nerve terminals and degeneration of the motor nerve endings [2, 4, 6, 8]. The recovery of motor function depends on the regeneration of the nerve terminals and formation of new motor end-plates.

Healing after nerve injury depends on many factors which are the focus of this study. However, available evidence suggests that vitamin deficiencies, especially vitamin B complex, may cause peripheral neuropathy [1] and primary sensory neuron injury symptoms such as hyperalgesia can be reduced via the use of B-vit [2]. Nerve regeneration studies have generally tested the eff

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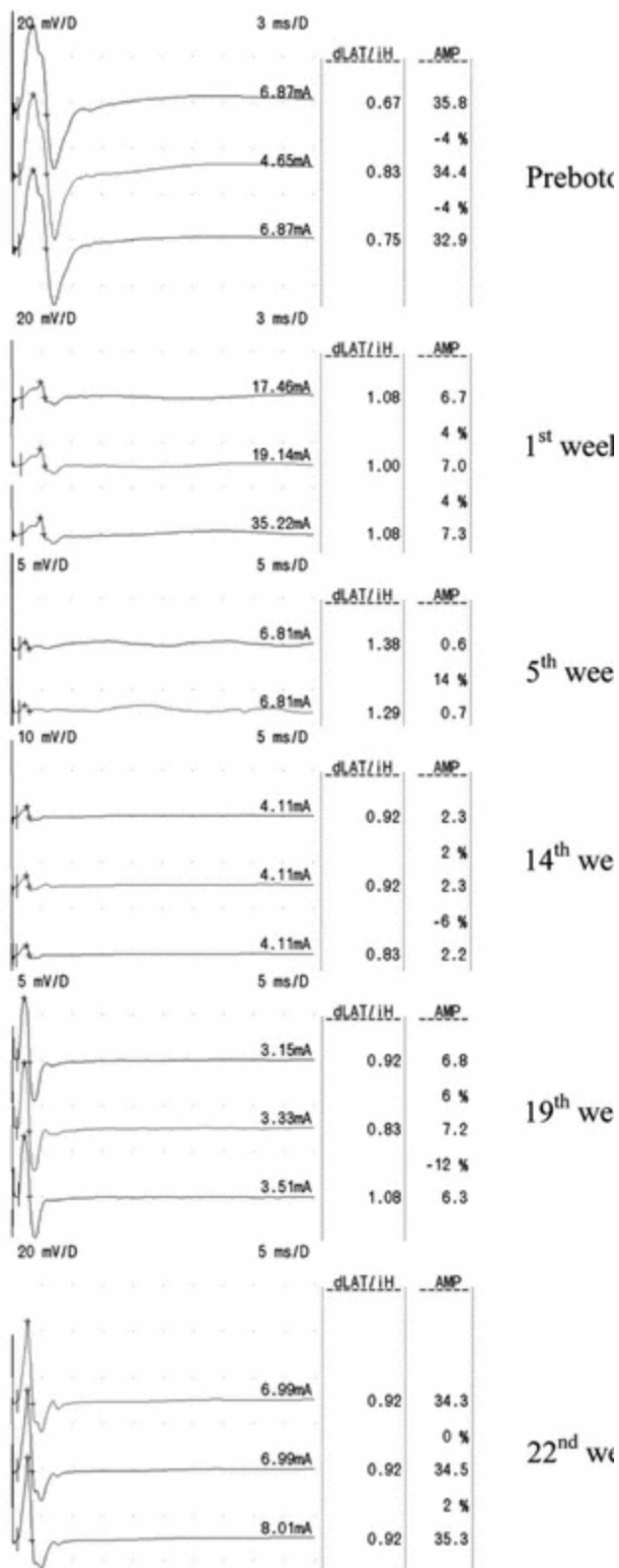
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Fig. 1 Gastrocnemius CMAP amplitude change during the time course (examples recorded from the same rat)



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