



Bone effects of repeated botulinum toxin injections into adult rat masticatory muscles

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Abstract:

Botulinum toxin (BTX) is a neurotoxin that induces muscle paralysis. It is widely used nowadays to treat several diseases with muscular dysfunction such as bruxism, temporo-mandibular joint disorder, orofacial dystonia or myofascial pain, by being injected repeatedly into the masticatory muscles.

Various studies on animals have shown a bone loss after muscle paralysis induced by BTX (in the lower limbs and in the mandibular region). A single injection performed in the masticatory muscles of adult rats induces bone loss in the alveolar and condylar region and leads to the occurrence of a bone hypertrophic metaplasia at a muscle entheses.

In order to get closer to the current clinical practice in human, we performed a study to evaluate the mandibular bone changes after repeated unilateral injections of BTX in the temporal and masseter muscles in adult rats. BTX repeated injections in masticatory muscles also lead to major mandibular condylar and alveolar bone loss that doesn't increase with the number of injections. They also lead to the occurrence of an entheses bone proliferation that does not seem to depend on the number of injections.

Mandibular bone changes have also been shown to occur in human after a BTX single injection.