

# Dry needling in situations with varying degrees of muscle tone: an *ex vivo* study

Margalef R.<sup>1</sup> Bosque M.<sup>1</sup> Santafé M.M.<sup>1</sup>

<sup>1</sup>Unit of Histology and Neurobiology, Department of Basic Medical Sciences, Faculty of Medicine and Health Sciences, Universidad Rovira i Virgili, Reus, Spain

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## Abstract

**Introduction** Numerous studies support the fact that myofascial trigger points are responsible for the clinical findings in myofascial pain syndrome, therefore it is reasonable to believe that the destruction of the same via dry needling may be an optimal solution. However, this technique has not been assessed in relation to muscle tone.

**Methods** The experiments were performed with the levator auris longus (LAL) muscle of Swiss adult mice. The muscles, once extracted from the animal, were maintained *ex vivo* using normal oxygenated Ringer solution. Once these were extracted, they were extended upon a Sylgard® surface, maintained *in vivo* at all times. In these conditions, 15 insertions were performed with dry needling needles (0.25 mm X 25mm; AguPunt) in the attempt to avoid repeating needling on the same site. Different degrees of muscle tone were obtained as follows (from lesser to greater tone): healthy animals; animal model of myofascial trigger points (PGM); muscles which, once extracted were treated with ClK 30 mM and ClCa<sub>2</sub> 5mM; formaldehyde. Immediately after treatment, the muscles were dyed with methylene blue.

**Results** The muscle fibers of healthy muscles are mostly pushed aside by the needle, practically without injury. Muscles with MTrPs are more injured than healthy muscles because of the use of dry needling, albeit only partially. The tone acquired with ClK and ClCa<sub>2</sub> is more powerful and generalized, therefore, dry needling creates a greater injury. Lastly, formaldehyde provokes a powerful increase of muscle tension, however the injury produced by dry needling is not so noteworthy, due to the fact that the muscle fibers fixed with formaldehyde are extremely resistant.

**Conclusions** Dry needling is a technique which, overall, provokes limited lesions, independent of the muscle tone.

## Keywords

- Myofascial Trigger Point
- dry needling
- muscle tone
- neuromuscular injury