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## Muscle trigger points and pressure pain hyperalgesia in the shoulder muscles in patients with unilateral shoulder impingement: a blinded, controlled study.

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### Abstract

Our aim was to describe the differences in the presence of trigger points (TrPs) in the shoulder muscles and to investigate the presence of mechanical hypersensitivity in patients with unilateral shoulder impingement and healthy controls. Twelve patients with strictly unilateral shoulder impingement and 10 matched controls were recruited. TrPs in the levator scapula, supraspinatus, infraspinatus, subscapularis, pectoralis major, and biceps brachii muscles were explored. TrPs were considered active if the local and referred pain reproduced the pain symptoms and the patient recognized the pain as a familiar pain. Pressure pain thresholds (PPT) were assessed over the levator scapulae, supraspinatus, infraspinatus, pectoralis major, biceps brachii, and tibialis anterior muscles. Both explorations were randomly done by an assessor blinded to the subjects' condition. Patients with shoulder impingement have a greater number of active (mean +/- SD: 2.5 +/- 1;  $P < 0.001$ ) and latent (mean +/- SD: 2 +/- 1;  $P = 0.003$ ) TrPs when compared to controls (only latent TrPs, mean +/- SD: 1 +/- 1). Active TrPs in the supraspinatus (67%), infraspinatus (42%), and subscapularis (42%) muscles were the most prevalent in the patient group. Patients showed a significant lower PPT in all muscles when compared to controls ( $P < 0.001$ ). Within the patient group a significant positive correlation between the number of TrPs and pain intensity ( $r (s) = 0.578$ ;  $P = 0.045$ ) was found. Active TrPs in some muscles were associated to greater pain intensity and lower PPTs when compared to those with latent TrPs in the same muscles ( $P < 0.05$ ). Significant negative correlations between pain intensity and PPT levels were found. Patients with shoulder impingement showed widespread pressure hypersensitivity and active TrPs in the shoulder muscles, which reproduce their clinical pain symptoms. Our results suggest both peripheral and central sensitisation mechanisms in patients with shoulder impingement syndrome.

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