



TOPICAL DELIVERY OF ANTI INFLAMMATORY DRUGS IN THE CASE OF TENDINOPATHY

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ABSTRACT

Tendinopathy is a common condition characterized by pain and impaired function of the affected tendon and muscle. Analgesia, inflammation and pain management are very important aspects in the therapeutic process. A mixture of Diclofenac and Dexamethasone was given locally via dermoelectroporation in the area of the damaged tendon and muscle. The pain threshold was recorded with Pressure Algometry, 10 cm VAS and used as a criterion for the drugs efficacy.

Using this method of application of nonsteroidal and steroidal anti inflammatory drugs has significant benefits like: quick pain relief, lower traumatic effect for the patient and minimum side effects. Based on these advantages it is thought that dermoelectroporation could be a preferable way of administering anti inflammatory drugs in inflammatory – degenerative conditions related to the musculoskeletal system, such as tendinopathies.

Key words: shoulder pain, pressure algometry, dermoelectroporation

INTRODUCTION

Tendinopathy is an inflammatory (1)–degenerative painful condition occurring in tendons and muscle in response to overuse. There are a number of areas of the body where tendinopathy can occur. Tendinopathy of the long head of the biceps, of the upper trapezius and deltoid muscle are a common cause of shoulder pain. The patients have difficulty in performing their routine daily activities when using the affected shoulder, they often lose the sleep which in itself leads to a worse quality of life and physical invalidation. The shoulder area becomes sensitive and painful when pressure is applied.

The common therapeutic approaches, such as providing rest for the affected shoulder, topical (gels containing NSAIDs) and systemic administration of nonsteroidal anti-inflammatory drugs, steroid injections, physiotherapy, laser therapy, ice application, shock wave therapy, etc., do not lead to satisfactory results in all cases (2, 3). The

incidence of gastrointestinal side effects is higher with traditional NSAIDs and systemic administration of these drugs for a long time is usually avoided.

MATERIAL AND METHODS

The procedure was carried out in 15 individuals (6 females and 9 males) aged between 30 and 60, diagnosed with shoulder pain, and no other accompanying disease. All the patients presented with a persistent pain and limited activity.

Prior to the transdermal delivery of anti-inflammatory drugs, by palpation we determined the area of pain, while at the same time we measured symmetrically and bilaterally the threshold of pain in the affected and the healthy shoulder by using Pressure Algometer Somedic (4, 5, 6). Pain assessment using 10-cm visual analog scale (VAS) was obtained too as part of the clinical evaluation of all patients.

A mixture (cocktail) of 75 mg 3 ml Diclofenac, 2 mg, 0.5 ml Dexamethasone and 1.5 ml saline was administered (7, 8, 9).

The transdermal drug administration – dermoelectroporation – is utilized locally by

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using Ultrapeel® Transderm® Ionto System by Mattioli Engineering in the area of the affected shoulder, following microdermabrasion (7, 8, 10). Through this method it is possible to perform a controlled exfoliation of the stratum corneum, which increased the skin permeability for the drugs applied in the treated area. The therapeutic procedures were performed every day, 3 or 4 times depending on the patients' condition. Dexamethasone was applied only in the first and the second day.

RESULTS

The threshold of pain sensitivity measured in the healthy shoulder was on the average 500 kPa/cm², which correlates with the data we obtained in our previous studies (6).

In the affected by the tendinopathy and pain shoulder algometric result was registered before each transdermal administration of the anti-inflammatory drugs. The measured threshold of the pain before the first administration was on the average 100 kPa/cm², before the second 250 kPa/cm², before the third 400 kPa/cm² and before the fourth it was 450 kPa/cm² on the average **figure 1**.

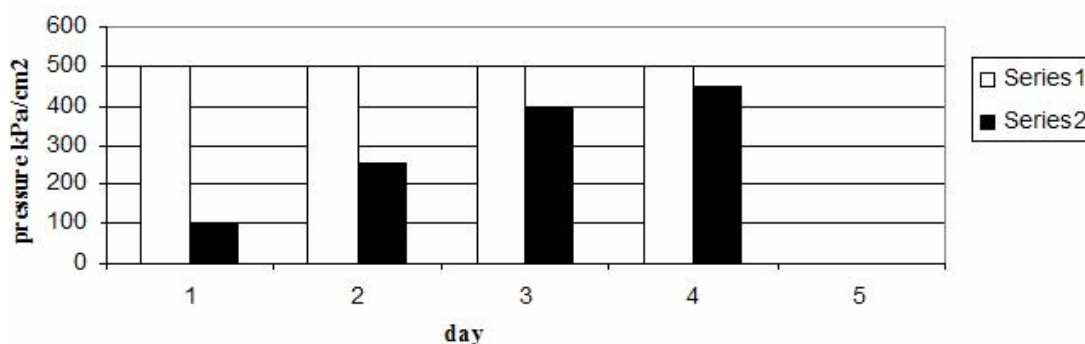


Figure 1 Bilateral pressure algometry
healthy shoulder - series 1 shoulder with pain - series 2

Pain intensity was assessed with a 10 cm visual analogue scale (VAS). Pain perception (VAS in cm) before the first administration was on

the average 7 cm, before the second 3,5 cm, before the third 2 cm and before the fourth it was 1cm **figure 2**.

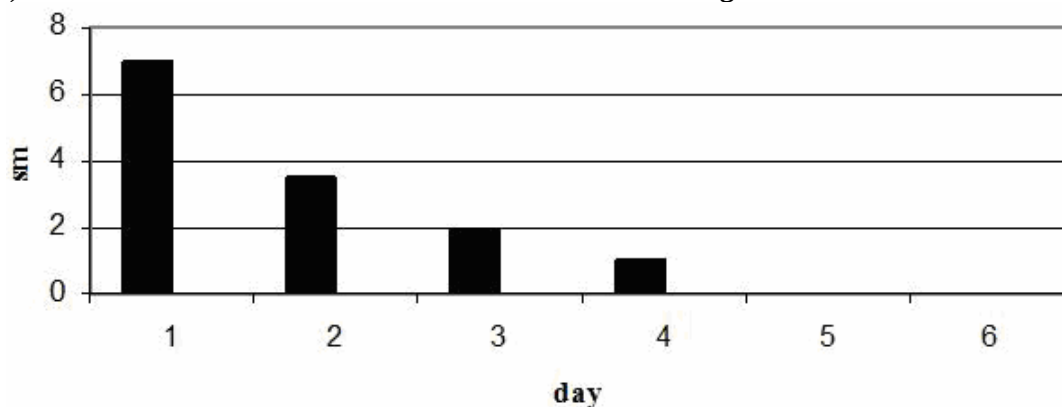


Figure 2 VAS pain score

The analysis of the algometric results and the VAS pain score complies with the reported improvement of the patients and objectively confirms that the Diclofenac-Dexamethasone combination, administered via the Ultrapeel®

Transderm® eradicates the pain in shoulder tendinopathy effectively and fast.

The treatment scheme with the Ultrapeel Transderm is entirely painless and non-traumatic.

During the course of the procedures and after discontinuation of the therapy no adverse drug effects were observed.

DISCUSSION

The fast control over the pain in shoulder tendinopathy through this mode of administration of drug combinations is a reliable criterion for the efficacy of the therapeutic application. The non-traumatic approach and the lack of adverse drug reactions are amongst its other advantages. The normal condition of the affected shoulder is re-established.

The long-term perspective is similar to that of the other therapeutic approaches: there always exists a risk of relapse, especially when intense activity is undertaken immediately after the course of treatment (2, 3).

CONCLUSION

The existent positive therapeutic results in cases of joint and muscle pain, as well as in other regions of the body (7, 8) expand the application of the Ultrapeel® Transderm® Ionto System. It is clinical-pharmacological interest to find out the lowest effective doses for drug administration in this manner. Such an approach would optimize the use of anti-rheumatic agents and could also be a promising perspective for the risk groups of patients, in whom the anti-inflammatory drugs of the steroidal and nonsteroidal type are counter-indicated.

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