

Aggressive Musculoskeletal Physiotherapy: Should We Treat Pain with Pain?

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Introduction

Musculoskeletal physiotherapy (MP) is a non-invasive intervention which uses specific therapeutic techniques to help overcome pathologies and injuries of the human musculoskeletal system [1]. These kinds of pathologies include musculoskeletal disorders with high epidemiological incidence rate such as low back and cervical pain, myofascial trigger points and sports injuries [2-4]. All such musculoskeletal injuries and pathologies include, among others, a common clinical characteristic the musculoskeletal pain.

Musculoskeletal pain is one of the most common types of pain, arising from the skin, fascia, bursa, muscle, ligaments, tendons and bones [5]. Etiology of this kind of pain is multifactorial including a) acute injury (e.g., Muscle strain, ligament sprain, bone fracture), b) repetitive strain and overuse (tendinopathies, bursitis, myofascial trigger points), and c) work- and posture related musculoskeletal disorders. This type of pain can be acute or chronic, local or diffuse [6]. The pathophysiology of musculoskeletal pain is not entirely clear, but inflammation, fibrosis, tissue degradation, neurotransmitters, and neurosensory disturbances have been implicated in pain process. Clinical symptoms may also include local discomfort or tenderness, peripheral nerve irritation, and decreased functional capacity regarding strength, flexibility, and neuromuscular control [7,8].

Management of musculoskeletal disorders is typically multimodal including a) physical therapy techniques like manual therapy, massage, electrotherapy and physical modalities (heat, ice), Instruments-assisted soft tissue techniques (IASTM), stretching and exercise prescription, b) use of nonsteroidal anti-inflammatory drugs (NSAIDs) and c) biomechanical corrections with the use of prosthetics and orthotics and targeted reduction of workload [9]. The predominant feature that determines the application intensity and dosage of above therapeutic interventions is, amongst others, the use of therapeutic techniques associated with causing or not musculoskeletal pain during their implementation.

For many years the most important educational instruction for clinical physiotherapists was to apply techniques up to the threshold of pain and no more [10]. This educational instruction was given on the basis that the infliction of pain when using therapeutic techniques implies tissue re-damage and recurrence of injury.

But is this the Right Script?

Several well-designed research efforts evaluating treatment strategies effectiveness for a) tendon overuse injuries, b) myofascial trigger points and c) specific sports injuries provide a negative response to this theoretical question.

First of all Alfredson et al. [11] showed that heavy- Load, pain provoking, eccentric calf muscle training for the treatment of chronic

Achilles tendinosis is a very efficient and safe method for reducing pain during activity and restoring functional capacity. It is important to notice that in this pioneering study, the patients were advised to continue performing the eccentric exercise even if they experienced pain and had to stop exercising only in the case of disabling pain. When they could perform the eccentric loading exercise without experiencing any minor pain or discomfort, they were instructed to increase the load by adding weight, thus increasing again the level of pain perceived by the patients. Alfredson's proposal was followed many other researchers in the treatment of tendinopathies in other body parts. Several other authors reported that noxious eccentric training for tendinopathies can decrease tendon volume and Intra tendinous signal, which correlated with improvement in pain sensation and individual performance [12]. Furthermore, this kind of intervention increase healthy collagen deposition and Type I collagen synthesis [13]and normalize tendon thickness structure [14]. Thus, the high intensity-eccentric exercise accompanied by mild or moderate musculoskeletal pain is one of the approaches to treatment for the rehabilitation of tendinopathies of the shoulder [15], elbow [16,17], hand [18], knee [19,20], and ankle [11].

Another pathological manifestation where effective treatment involves techniques that are aggressive and accompanied by the infliction of pain is the myofascial trigger points (MTrPs). In this case, several also researchers [21-23] reported that that the application of a noxious-painful stimulus is the key to obtaining improvements in pain pressure threshold and pain sensation perception from MTrps. Likewise, ischaemic pressure, Ergon[®]IASTM Technique and dry needling, have shown benefits in releasing myofascial induced muscle spasm and aches [21-23]. Less pain stimulatory interventions, such as laser and ultrasound, have not convincingly been shown to be beneficial [24-26]. In our recent study [21], it was demonstrated that aggressive therapeutic techniques such as Ergon[®]IASTM Technique, ischaemic pressure, and cupping treatment are useful in reducing tenderness of myofascial trigger points (MTrPs). The effectiveness of such therapeutic interventions in MTrPs treatment can be theoretically attributed to a) local temperature and blood flow increase, b) localized tissue manipulation and stretch and c) reduction of fascial adhesions and restrictions.

Furthermore, specific massage (deep stripping and Dynamic Soft Tissue Mobilisation) and soft tissue techniques like cupping massage, and instrument-Instrument Assisted Soft Tissue Mobilization Techniques (IASTM) which have been developed in the last years are performed with particular intensity and pressure causing considerable pain (VAS=4-5) [27-29]. Hopper et al. [29] showed that subjects who received dynamic Soft Tissue Mobilisation followed by distal to proximal longitudinal strokes performed during passive, active, and eccentric contraction of the hamstring achieved significantly greater hamstring flexibility improvement than the control and those receiving classical massage techniques. We have also showed [28] that

aggressive massage and mobilization techniques such as stripping, Ergon IASTM and cupping massage performed with great intensity directly on a muscle injury site though provoked significant temporary pain, significantly accelerated the mobilization of hematoma and edema after a hamstring strain without causing any other problems to the athlete besides temporary pain. It seems that these aggressive and noxious interventions can mobilize the swelling-hematomas to superficial layers of the muscle, through myofascial pathways and creates favorable conditions for the reunion of the injured muscle fibers decreasing thus significantly recovery time from grade I hamstring strain observed in this case study [28].

It should be emphasized that the pain exacerbated by the application of dynamic therapeutic techniques can be attributed to a temporary increase in pressure on pain receptors from mechanical stress and not solely from deterioration of the injury. This theoretical assumption is reinforced by the fact that as shown, subjects with different musculoskeletal pathologies reported significant improvement in their symptoms and functional capacity after each noxious treatment procedure. Additionally, we should remember that it is also thought that dynamic and aggressive therapeutic manipulation of the body (deep-pressure massage with hands or clinical instruments) also results in the release of endorphins which can mask the perception of pain [30,31].

A key conclusion from the above reports is that clinical physiotherapists must not be afraid, but to respect the pain that causes to their patient. In too many cases the pain is not a sign of recurrence of injury but merely a clinical manifestation of dynamic therapeutic interventions, non-hazardous for the rehabilitation process of the injuries. Nevertheless, the pain that will result from implementing aggressive techniques should not be excessive and should not lead to a protective muscle spasm and development of new signs re-injury such as swelling and persistent pain.

So to the question that has been raised to the title of the article "should we treat pain with pain?" the answer in some cases can be YES.

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