Introduction/Background

Repetitive or strong noxious stimulation of the musculoskeletal system leads to a neurogenic inflammation which results in a peripheral sensitization with Allodynia and primary hyperalgesia as well as central sensitization causing pain in otherwise healthy tissue. Which role has the thoraco lumbar fascia TLF in low back pain and which role have the underlying muscles. Shockwave are a widely-used method for the diagnosis [1] and treatment of low back pain [2] Shockwaves can identify areas of neurogenic inflammation by eliciting the patients pain.

Hypothesis: Areas of neurogenic inflammation in the posterior layer of the TLF and the subcutaneous connective tissue respond stronger to focused shockwave stimulation compared to the corresponding underlying back muscle.

Methods

A sequential clinical protocol with no fixed sample size was applied [3]. The TLF and the muscles were scanned with a focused piezoelectric shockwave device (Piezoson 100 plus, Richard Wolff Germany). Intensity 0.11 mJ/mm² ED+ to 1,48 mJ/mm² ED+. Focus length ≈ 6 mm, diameter ≈ 1.5 mm. The scanning stopped when a local or referred pain response was elicited. The examination was done as part of the usual routine examination of low back pain patients in a private clinic setting. The research conformed to the Declaration of Helsinki https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2008.pdf.

Results

The hypothesis was rejected after 18 exams. The Average ED+ for the posterior layer of the TLF was 1.23 mJ/mm² and 0.77 mJ/mm² for the underlying muscle.

Conclusion

These results reflect the daily clinical experience when working with sharply focused piezoelectric shockwaves. Often you seem to get a stronger response of local and referred pain from deeper lying muscle under the posterior layer of the TLF. The assumption is that there is a higher density of nociceptor in the posterior layer of the TLF compared to the nociceptor density in the vascular nerve bundle in the endomysium. But possibly the deeper structures might have more neurogenic inflammation with a significantly lower pain threshold. For all practical purposes it appears advisable to examine and treat not only the posterior layer of the TLF and the subcutaneous tissue but to go deeper into the underlying muscle areas as well.

References