Bhatnagar T, Azim FT, Behrouzian M, Davies K, Wickenheiser D, Jahren G, West N, Leveille L, and Lauder GR. **Assessing changes in range of motion in adolescent patients undergoing myoActivation® for chronic pain related to myofascial dysfunction: a feasibility study**. Frontiers in Pain Research. 2023;4:1225088.

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What was the aim of this study?

This study aimed to track the detailed body movements of five adolescent patients with myofascial dysfunction and pain undergoing myoActivation® using motion lab technology with motion sensors to accurately measure movement changes.

What is myofascial dysfunction?

(myo = muscle; and fascia = sheath-like covering that surrounds and supports all body tissues and organs)

Myofascial dysfunction can be identified by detecting a combination of one or more physical findings including: tight muscle pain points, dense thickened fascia, scars, or changes in posture. The impact of tight muscles, fascial thickening, and/or scars is stiffness that causes limitation in the ability to actually achieve some movements and reduced speed in doing these movements. These changes impact the function of the entire body because fascia is connected throughout the body. These tissue changes often occur in response to a past injury, surgery, or repetitive strain including high intensity athletic training.

What is myoActivation® ?

The myoActivation process is an innovative method that allows clinicians to easily assess and treat myofascial dysfunction and mobility impairment. myoActivation aims to resolve chronic pain, improve the ease and range of movement, and enhance a patient's sense of wellbeing.

The myoActivation examination uses standardized movement tests. The purpose of the examination is to find the movement test that stands out as the most restricted or painful. The myofascial tissues that correlate with that movement test are considered the most important to examine first. This prompts the clinician to examine that area of the body for scars and to palpate the tissue, feeling for palpable painful points in muscle or thickened, dense fascial tissue.

myoActivation treatment uses the quick insertion of fine gauge hypodermic needles to release any identified muscle or fascial trigger points and/or scars in that area. The movement tests are sequentially repeated to assess and to treat other sources of myofascial dysfunction. This therapy is a very low-cost, drug-free technique. myoActivation treatment results in immediately observed and reported changes in pain, flexibility, and ease of movement. While these immediate changes are regularly observed clinically, they have never been objectively or quantitatively measured with clinical motion analysis.

What did we find?

Five adolescent patients performed the standard set of baseline myoActivation movement tests whilst wearing motion sensors and being recorded by motion capture cameras. These patients then underwent an initial myoActivation treatment, immediately followed by repeating the set of myoActivation movement tests. Full treatment course for these patients ranged from 2 to 5 myoActivation sessions.

After the final myoActivation treatment, the patients completed the set of myoActivation movement tests again using motion lab technology to measure changes in their range of motion and the speed at

which they performed the movements. Quantitative motion lab data compared subjects' range of motion and movement speed before treatment with myoActivation and after the final treatment session.

This study demonstrated objective, quantifiable evidence of improvement in range of motion and movement speed. Many of these meaningful changes were demonstrated after a single treatment session using myoActivation, while even greater improvements were shown over the course of serial treatments (2-5 treatment sessions).

In most cases, clinical motion analysis demonstrated changes in movement that had been predicted by the myoActivation clinician prior to treatment. This finding suggests that the unique assessment approach used in myoActivation accurately identifies culprit myofascial tissues that contribute to limitations or pain with specific movements. Further, this suggests that when these abnormal myofascial tissues are released by needling, predictable improvement in specific movements are noted.

Interestingly, there were some instances where patients showed improvement in the range or ease of movement that had not been predicted by the clinician. This finding supports the important concept of biotensegrity. Humans, like suspension bridges, are biotensegral structures; that means humans are three-dimensional visco-elastic beings where bones serve as struts that exist in a tensioned myofascial matrix. This allows human beings to be functional movement units and contributes to the stability of the whole body. Restriction of normal movement due to abnormalities within myofascial tissues generates tension along the fascial continuum leading to distorted biomechanics, altered biotensegrity, and chronic pain. With this concept in mind, given the complexity and interconnectedness of the human body, it is not surprising that improvements were noted in areas beyond those predicted by pre-treatment myoActivation assessment.

What are the next steps?

These preliminary findings demonstrate that myoActivation can have an immediate and beneficial effect on the range and fluidity of movement in patients with chronic pain due to myofascial tissue dysfunction. This study has shown the value of clinical motion analysis in capturing real-time movement changes following myoActivation treatment. Further research to confirm these findings would benefit from a larger, more detailed study, with a diverse patient population, including adults.

Why is this important?

While this is a small feasibility study of five patients, the results demonstrate that clinical motion analysis has huge potential to support clinicians in evaluating, treating, and teaching myofascial release. The results also highlight how profoundly both flexibility and ease of movement can be impaired by dysfunctional myofascial tissues, and how quickly movement can be improved with myoActivation treatment.

These results should kindle a great deal of curiosity around the importance of fascia, scars, and muscles in sustained contraction – specifically, how these tissues influence body movement. This study also opens a door to exploring the role of myofascial dysfunction in many complex pain presentations.

Finally, given the high prevalence of pain presentations and limited options for drug-free treatment, these preliminary results are highly encouraging in that myoActivation may provide clinicians with an effective, low-cost, drug-free treatment strategy.

Read the full report at https://doi.org/10.3389/fpain.2023.1225088

Other relevant publications:

1. Lauder G, West N. *Clinical Insights into the Importance of Scars and Scar Release in Paediatric Chronic Myofascial Pain* [Internet]. Pain Management - Practices, Novel Therapies and Bioactives. IntechOpen; 2021.

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2. Lauder GR, Huang J, West NC. *Unrecognised myofascial components of pediatric complex pain: myoActivation, a structured solution for assessment and management*. Curr Trends Med 2019; 1(1): 1-16.

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3. Lauder G, West N, Siren G. *myoActivation: A Structured Process for Chronic Pain Resolution* [Internet]. From Conventional to Innovative Approaches for Pain Treatment. IntechOpen; 2019.

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5. Schleip R, Zorn A, Klingler W. *Biomechanical properties of fascial tissues and their role as pain generators. Journal of Musculoskeletal Pain*. 2010;18(4):393-5.

   Available from https://doi.org/10.3109/10582452.2010.502628