Decrease of leg length discrepancy and kyphotic angle in patients with acute low back pain through osteopathic treatment and myofascial release. An RCT

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Introduction

- There is ongoing interest in fascia research search, particularly as a possible cause of low back pain (LBP). [1]
- Spine shape parameters, such as leg length and kyphotic or lordotic angle, are influenced by low back pain. There is also evidence that the thoracolumbar fascia (TLF) plays a role in such pathologies. [1]

Changes in spinal shape parameters and TLF biomechanical behaviour have been reported for myofascial release (MFR) techniques and osteopathic treatment (OMT).

Objectives

- The aim of this study was to investigate the immediate effects of a **MFR on the TLF** and of **OMT** on **spinal shape parameters.**

Previous work testing the feasibility of this study showed promising changes in the myofascial chain system. [2]

Methodology

This study was a single-blind randomized placebo-controlled trial. Seventy one subjects (43.8 ± 10.5 years) suffering from aLBP were blinded assessed, and randomly and blinded assigned to three groups (Table 1).

Figure 1. MFR and PLC treatment at the TLF

- **MFR**: The group received an intervention as described by Chila and O'Connell (Figure 1). [3]
- **OMT**: OMT of the structures identified as dysfunctional was carried out, individually adapted to the symptomatology.
- **Placebo** (PLC): The group received a sham intervention similar to that of the MFR group, but the hands were applied with minimal pressure.

Baseline characteristics	MFR group mean ± SD	OMT group mean ± SD	PLC group mean ± SD
Gender (m/w)	12/12	14/10	8/15
Age (years)	45.7 ± 9.4	43.2 ± 11.4	42.3 ± 10.6
Height(m)	1.72 ± 0 .1	1.75 ± 0.1	1.70 ± 0.1
Weight (kg)	75.8 ± 13.4	78.3 ± 14.3	72.3 ± 9.6
Pain duration (days)	11.7 ± 6.8	10.1 ± 8.5	14.4 ± 6.9

Table 1. Baseline characteristics

Spinal shape parameters (functional leg length discrepancy (fLLD), kyphotic angle, lordotic angle) were measured before and after the intervention using video raster stereography (VRS).

Results

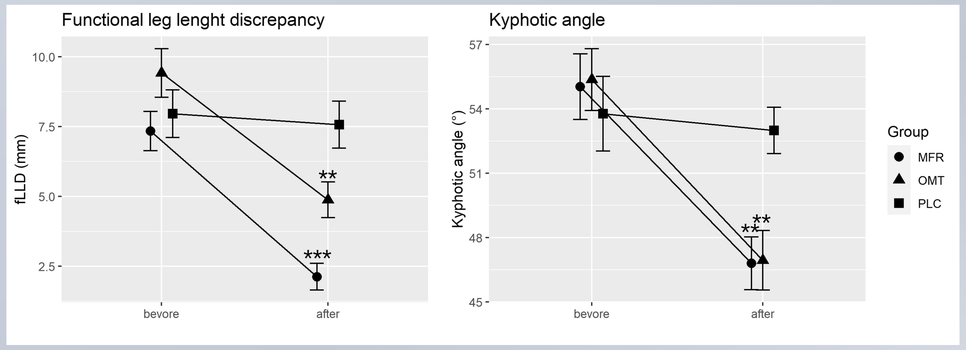

Figure 2. Changes between baseline and after treatment. Significant at the level ** < 0.01. *** < 0.001.

- **Mixed ANOVA** showed significant interactions for fLLD ($p < 0.001$) and kyphotic angle ($p = 0.04$) but not for lordotic angle ($p = 0.16$).
- Significant **changes between** the MFR/PLC and OMT/PLC groups for fLLD ($p < 0.001$; $p = 0.004$) and kyphotic angle ($p = 0.008$; $p = 0.006$) were found but not for the MFR/OMT groups ($p = 0.23$; $p = 0.99$).

Outcome	MFR group (n=24) mean (95% CI)	OMT group (n=24) mean (95% CI)	PLC group (n=23) mean (95% CI)
fLLD (mm)	**-5.2 (-8.8 – -1.6)*** **	**-4.5 (-8.1 – -1.0)** **	-0.4 (-4.0 – 3.2)
Kyphotic angle (°)	**-8.23 (-15 – -1,4)** **	**-8.42 (-15 – -1.6)** **	-0.8 (-7.7 – 6.1)
Lordotic angle (°)	1.5 (-5.8 – 8.7)	-5.0 (-12.3 – 2.3)	0.1 (-7.4 – 7.5)

Table 2. Within group changes between baseline and after treatment. **p < 0.01. *** p < 0.001.

Information's and References

Ethics Committee: Osteopathic Research Institute in Hamburg, Germany (Nr. 019-11, 25.07.2019).
Registration: German Clinical Trials Register (DRKS00024122)
References:

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Discussion/Conclusion

The treatment could stimulate mechanoreceptors in the fascial tissue in addition to altering only skin receptors.

- Adhesions between fascia layers can block muscle spindles and disrupt motor control (Figure 3).

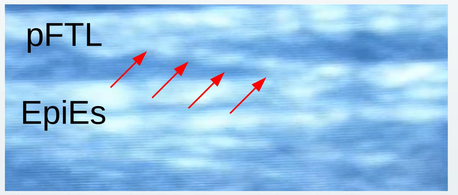
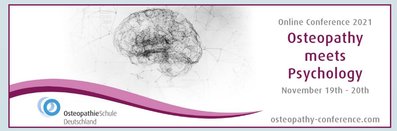


Figure 3. Adhesion of the TLF. pFTL: posterior layer of the thoracolumbar fascia; EpiES: epimysium of the erector spinae muscle.

- Fascial tissues, such as the TLF, are capable of active contraction, particularly in response to TGF-ß1. [4] Its cytokine cascade is remarkably activated during chronic stress. [5]
- MFR and OMT could have a regulatory effect on these pathologies.

Future work

- Examining the long-term effects of MFR and OMT, including a follow-up.
- Develop new methods to identify relationships between TLF and impaired motor control of paraspinal muscles.
- Identify stress-related changes in TLF and possible intervention methods.



Keywords thoracolumbar fascia; myofascial release; osteopathy; leg length discrepancy; kyphotic angle; lordotic angle

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