

# Modulated Midfrequency Electrotherapy as Treatment Modality of Acute Low Back Pain

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## Summary

We wanted to investigate what therapeutic effect could be achieved by modulated midfrequency electrotherapy (MET), mobilization techniques and the combination of massage and hot packs on acute low back pain. Therefore 60 subjects (mean age  $53,18 \pm 14,95$ ) were randomly divided into three treatment groups. Subjective sensation of low back pain was measured by the visual analogue scale (VAS) before and immediately after treatment. The data was analysed using t-test. Directly after treatment there was a 63,09% reduction of VAS in the MET-group ( $p < 0,0001$ ), 17,17% in the Mobilization-group ( $p < 0,03$ ) and 20,48% in the Massage/Hot-pack-group ( $p < 0,02$ ). All three treatment modalities had an immediate pain relieving effect. Due to the positive results it should be asked if a combination of these modalities would show a better outcome. Further studies should follow in order to investigate and verify these results.

## Introduction

Acute low back pain (LBP) is one of the most frequent ailments in the industrialized world (1). While high- and low-frequency electrotherapy are often used for different kinds of pain syndromes the mid-frequency therapy is more neglected in this field of research (2). Our goal was to investigate what immediate therapeutic effect could be achieved by modulated mid-frequency electrotherapy (MET), mobilization techniques and the combination of massage and hot packs on acute LBP.

Table 1: Modulation of midfrequency electrotherapy

	1. Therapystep	2. Therapystep
Low frequency impuls sequence	70 Hz	10 Hz
Impulse intensity	80 %	80 %
Swelling sequence	50 Imp/min	50 Imp/min
Swelling intensity	0 %	20 %

## Materials and Methods

In this pilot study 60 subjects (mean age  $53,18 \pm 14,95$ ) with acute low back pain were randomly divided into three treatment groups. (*Graph1*) One group received MET (AmpliMed®syncho - Straußenfeder & Schlangenei Vital Produkte GmbH Ehringshausen), the second a combination of massage and hot pack and the third manual therapeutic mobilization for twenty minutes. MET to the lumbosacral region was applied for 20 minutes per day in 2 therapy steps for 10 minutes each. The carrier wave had a frequency of 2000 Hz. (*Table1*)

For the application of the electrodes a 2-end cable was used. 2 electrodes with a length of 10 cm were placed both sides of the spine so that the painful area was between them (3). (*Figure 1*)

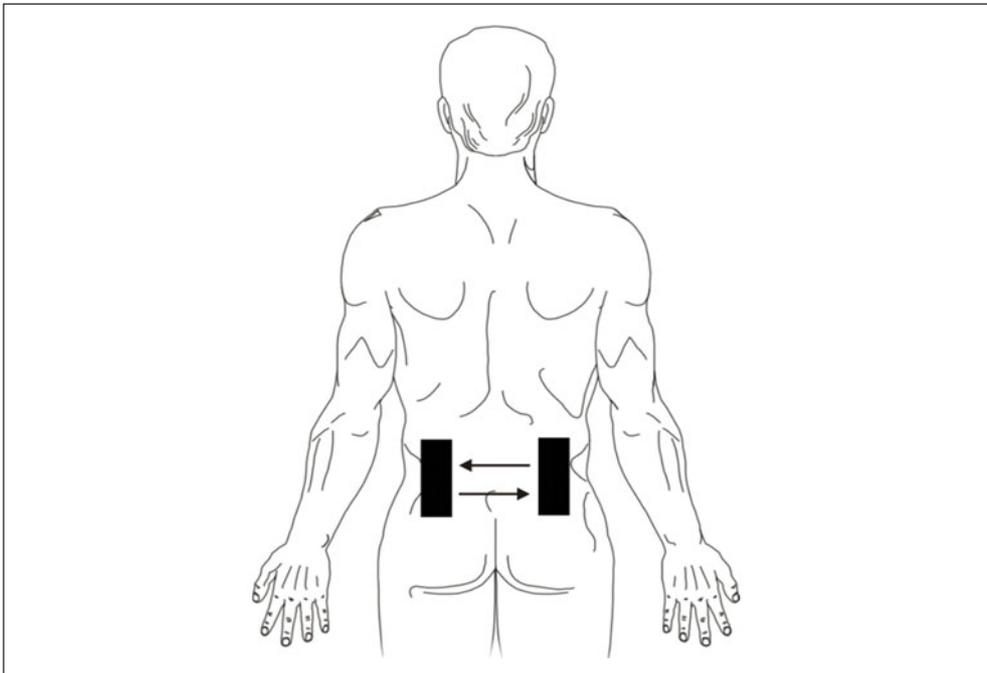
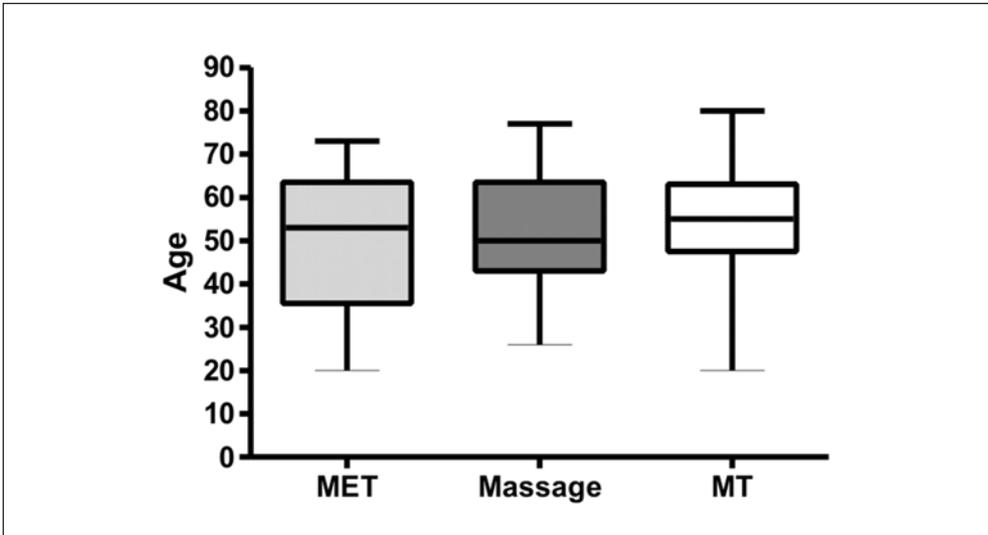


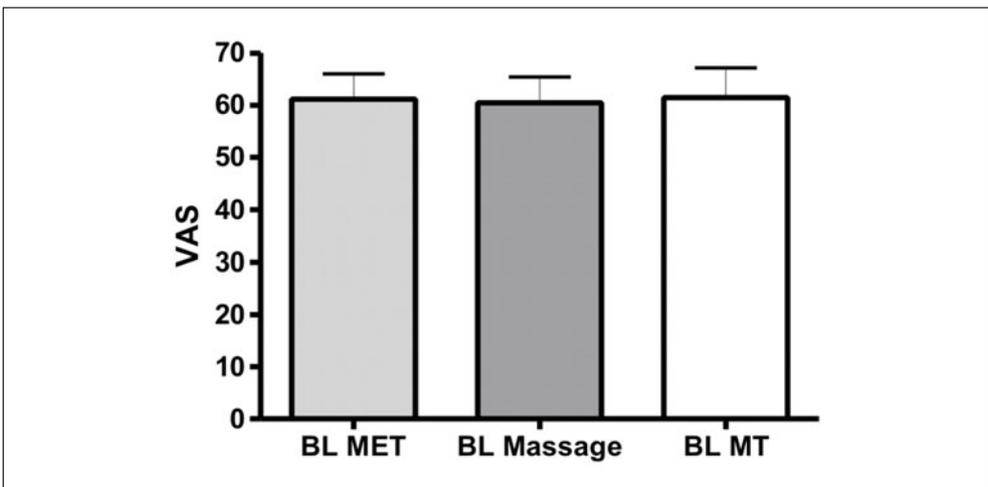
Figure 1: Electrodeplacement (Black Box=Electrode, Arrow=Flow of current)



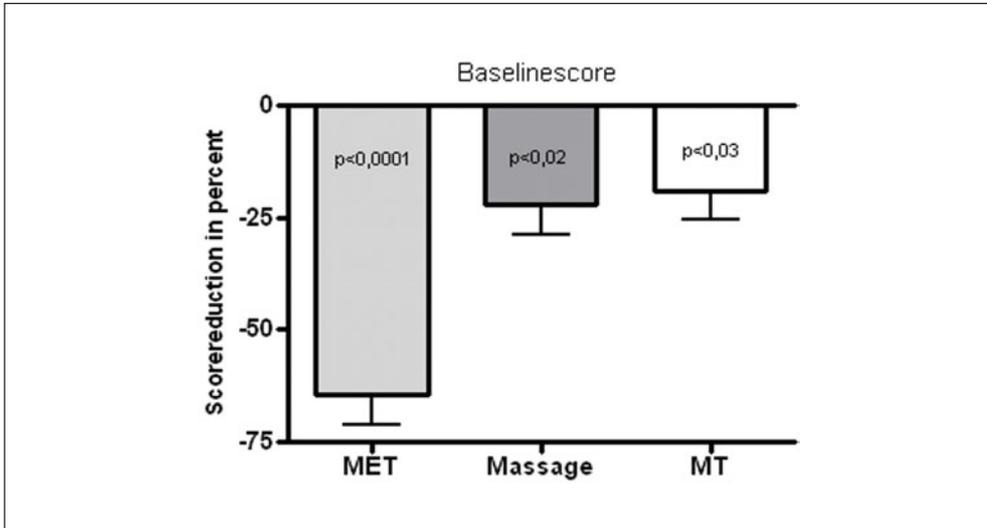
Graph 1: Mean Age distribution with standard deviation (VAS=Visual Analog Scale; BL=Baseline; MET= Modulated Midfrequency Electrotherapy; MT=Manual Therapy)

The patients who received massage were treated with conventional western massage followed by paraffine hotpack for 10 minutes. The mobilization group received manual traction and articular techniques.

Mode and intensity were chosen by the physiotherapist in accordance with



Graph 2: Mean baseline pain evaluation with standard deviation (VAS=Visual Analog Scale; BL=Baseline; MET= Modulated Midfrequency Electrotherapy; MT=Manual Therapy)



Graph 3: Mean reduction of baselinescore directly after therapy with standard deviation (MET= Modulated Midfrequency Electrotherapy; MT=Manual Therapy)

the patient's condition and diagnosis as usual in clinical routine. The subjects didn't have any kind of physiotherapy before the beginning of treatment.

Inclusion criteria were acute low back pain for at least 48 hours. Exclusion criteria included pregnancy, neuromuscular and neurological disorders, muscle atrophy, leg pain, a long history of back pain, pacemaker and cardiac arrhythmia. Subjective sensation of low back pain was measured by the visual analogue scale (VAS) with a range from 0 to 100 before treatment and immediately after treatment. The data was analyzed using t-test by the computer program Prism 4.

## Results

The VAS baseline score was  $61,18 \pm 19,84$  for MET,  $60,44 \pm 21,24$  for Massage and  $61,44 \pm 24,21$  for MT. (Graph2)

Directly after treatment there was a 63,09% reduction of Mean-VAS in the MET-group ( $p < 0,0001$ ), 17,17% in the Mobilization-group ( $p < 0,03$ ) and 20,48% in the Massage/Hot pack-group ( $p < 0,02$ ) in comparison to the prestimulation value. (Graph 3)

## Discussion

The immediate benefit for the patient with acute low back pain is most relieving and quite important (4). All three treatment modalities had an immediate pain relieving effect on the patients of our study while MET showed the best reduction of VAS-score directly after treatment as seen in transcuta-

neous electrical nerve stimulation (5). The reduction due to massage/hot pack and mobilization was statistically significant showing also the efficiency of these therapy modalities (6,7) while literature on massage alone is contradictory (8). In order to make a statement about long term effects a larger number of subjects and a longer observation time are necessary. It would be also be interesting to investigate what a combination of the therapy modalities could achieve rather each treatment alone (9). Further studies should follow in order to investigate and verify these results.

## References

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