A STUDY ON THE EFFECTIVENESS OF MUSCLE ENERGY TECHNIQUE (MET) AS COMPARED TO MANUPLATION THERAPY IN CHRONIC LOW BACK PAIN

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Abstract — The purpose of this study was to determine whether patients with acute and sub-acute low back pain would demonstrate a reduction in disability after being treated with MET as compared to manipulation therapy.

Keywords. MET, manipulation therapy.

Introduction

Low back region comprises of mainly three structures: the lumbar region, the pelvic girdle & the hip complex. The pelvic girdle maintains its stability via capsular ligaments, articular surface congruency and myofascial component. The articular cartilage & ligaments are very strong & covered by myofascial component, thus does not involve easily in non-specific LBP. In normal individuals deep trunk muscles such as the transverse abdominis, multifidus, the lower fibers of the obliquus internus abdominis (OI) and the diaphragm activate before limb or trunk motion, and also help to control stability of intrapelvic motion for transference of loads as these muscles may also induce posterior rotation of the innominate relative to the sacrum, increasing spinal stability and compression, as well as stability of the sacroiliac joint.

In individuals with non-specific LBP, due to prolong sitting the erector spinae is held in a sustained contraction & often tests weak. A muscle is weak in its shortened position, and sustained contraction weakens a muscle and Multifidus become inhibited. Jull and Janda have discovered predictable patterns of muscle imbalance.

Though considered as a manual therapy, MET is not particularly a mobilization or manipulation technique. MET is an active technique in which subjects rather than therapist provides corrective force. Greenman, defined MET as a "manual medicine treatment procedure that involves the voluntary contraction of the subject’s muscle in a precisely controlled direction, at varying levels of intensity, against a distinctly executed counterforce applied by the therapist." MET is a versatile technique traditionally used to address muscular strain, PAIN, local edema and joint dysfunction. MET has shown improvements in range of motion, reducing pain reliving muscle tension & spasm, & increased strength of the muscle.

Evidence to support the use of lumbar manipulation in patients with acute lumbopelvic pain with moderate severity has been reported, yet, because the treatment pattern of manually trained clinicians varies, It would be useful to determine if MET offered similar benefits (albeit, short-term) in patients with acute LPP. Since very less study have been done on MET, the purpose of this study is to determine the effectiveness of MET for acute non-specific low back pain over the period of 1 week with 3-4 treatment sessions.

2 Literature Review

A large percentage of the adult population suffers from LBP, with a high frequency of recurrent episodes (Wasiak et al. 2006). The prevalence of LBP in adults has been well documented with a life-time prevalence of over 70%, one-year period prevalence of over 50% and a point prevalence of over 20%, although some studies have reported it to be has high as 40% (Kovacs et al 2003; Leboeuf-Yde and Kyvik 1998). Recent evidence has indicated that non-specific acute LBP manifests in an unpredictable pattern of symptomatic periods, interspersed with less troublesome or symptom-free periods (Burton et al 2004).

Two studies exist in the peer-reviewed literature that have examined the effect of MET on cervical and lumbar motion, and have demonstrated increased range of motion (ROM) following treatment. Schenk et al. examined the effects of MET on ROM for cervical region over a four-week period...
involving multiple MET sessions. Cervical axial rotation was significantly increased following the treatment period.

MET applied to the thoracic spine in the direction of restricted rotation significantly produced increased range of active trunk rotation (p<0.0005), but not on the non-restricted side or in the untreated controls. This study supports the use of MET to increase restricted spinal rotation range of motion.

One more study was done on the use of a 5-second isometric contraction appeared to be more effective than longer contraction durations for increasing cervical range with MET.

Kravitz et al., (1981) found that there were high levels of paralumbar muscle tension in patients with low back pain. The way in which muscles tend to react, either by over activation and tightness or by inhibition and weakness, appears to be fairly consistent for the particular muscle concerned (Twomey & Taylor, 1987: 257). Muscles which have a tendency to become tight are usually those that span more than one joint namely, quadratus lumborum and erector spinae (especially lumbar and thoracolumbar segments). Any acute pain in the lumbar motion segment can initiate muscle responses which, if they persist, can alter the patients’ pattern of movement and in turn perpetuate adverse strains on the lumbar spine (Twomey & Taylor, 1987: 257).

3 Research Methodology

This section deals with the study methodology, which includes patient recruitment, sampling and group allocation, inclusion and exclusion criteria, patient procedure, treatment application, measurements and data analysis. This study was designed as a prospective, comparative, randomised clinical trial which compared two groups of patients who suffered from chronic low back pain. One group received manipulation while the other group received muscle energy technique. Data collected from the two groups was statistically analysed to determine which treatment protocol was more effective as well as to identify differences within a specific group. The selection of patients was by means of convenience sampling. Patients were selected from those who responded to advertisements placed in local newspapers, sport clubs, shopping centres, gyms, pharmacies and notice boards, pamphlet distribution and word of mouth. The study was available to anyone who could arrive for treatment at the presenting with chronic stable ankle inversion sprains (i.e. complaining of a history of low back pain and resulting residual low back pain symptoms). No restrictions were placed on the patient’s race, sex, occupation, or residential area. All patients were between the ages of 18-50 and were screened to make sure that they satisfied the criteria required in order to participate in this study.

4. Results Analysis

The hypothesis tested in this study stated that a group of subjects with limited range of motion treated with MET would demonstrate a statistically significant increase in lumbar range of motion and a decrease in pain as compared to subjects being treated with specific passive mobilization. Data analysis was done in SPSS version 11.5 (SPSS Inc., Chicago, Ill, USA).

The treatment effect of the muscle energy technique compared to the passive mobilization was tested using repeated measures ANOVA for each outcome measurement over three time points. Algometer readings were averaged for each time point between the algometer readings at each side (left or right) for each fixation. If the time*group interaction effect was statistically significant (p<0.005) a treatment effect was concluded. Repeated contrasts were used to compare the interaction and time effect between time 1 and 2, and between time 2 and 3. The profile plot of the means for the two groups over time was examined for the direction of the treatment effect or to detect any possible trends in the data which may not have been statistically significant. The number of joints fixated was used as a covariate in the models to test whether this factor affected the outcomes.

5. Conclusion

The results showed that Muscle Energy Technique is as effective as Manipulation (an already researched treatment tool) in the treatment of low back pain. Results obtained from the different outcome measures considered in this study suggest that both interventions were moderately effective in managing pain and disability in patients with chronic LBP. The treatment was not harmful, but provided as much benefit as the control. Thus subjects who were exposed to manipulation therapy recovered to the same extent as those treated with MET. Some objective outcomes showed a trend which suggested that there might have been an interaction if the sample size was larger, but some trends favoured the control group and some favoured the muscle energy group. Thus the conclusion from this research is that there was no difference between the treatments.

References


