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Effect of Muscle Energy Technique as an Adjunct to Lumbar Stabilisation Exercise Training on Pain, Disability and Fear Avoidance belief in Patients with Chronic Low back pain with facet joint dysfunction: Randomized Controlled Trial

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Abstract

Background: Low back pain (LBP) is the second leading cause of disability, affecting 85 percent of people worldwide at some point in their life. LBP is viewed as a personal and societal burden due to discomfort and limited function. Facet joint dysfunction is one of the leading causes of pain and disability. While the Muscle Energy technique (MET) looks to be a promising treatment, research on MET in combination with exercise therapy is limited.

Method: Sixty patients, 18 to 40 years of age, with a history of chronic low back pain will be randomly divided into two groups. One group will receive lumbar stabilization exercise training along with muscle energy technique and the other group will receive lumbar stabilization exercise training alone respectively for 3 times a week for 4 weeks. Data will be collected pre and post the intervention on the Numeric Rating Scale, Oswestry LBP Disability Questionnaire, and Fear-avoidance belief questionnaire.

Result: Both groups will be analyzed for pain, disability, and patients' fear-avoidance belief regarding physical activity Baseline characteristics including means and standard deviations (SDs) will be analyzed. Categorical variables will be analyzed with a chi-square test and continuous variables will be analyzed using independent t-tests.

Keywords: Facet joint dysfunction; low back pain; lumbar stabilization exercises; muscle energy technique; modified Oswestry disability index; numerical pain rating scale; fear-avoidance belief questionnaire.

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Introduction

In all developed countries, non-radicular low back pain is a serious public health concern that is routinely managed in primary care settings.[1] The majority of people experience incapacitating back pain at some point in their lives. An estimated 6.5 million people worldwide are bedridden due to this painful ailment, and physical therapists see 1.5 million new instances of back pain each month.[2] Low back pain is extremely common in India, with nearly 60% of Indians experiencing severe back pain at some point in their lives.[3] Non specific low back pain is discomfort, muscle tension, or stiffness in the lumbosacral region that is located below the costal border and above the inferior gluteal folds but does not involve leg pain (sciatica).[4] Pain, morning stiffness or discomfort is a common sign of this troublesome illness, which is frequently recurrent. Forward flexion, as well as returning to a standing position after commencing the movement, generates pain, which is aggravated by extension, side flexion, rotation, standing, walking, sitting, and general exercise. The pain worsens during the day and is relieved by changing positions, especially lying in the fetal position.[5] Due to a possible pathoanatomical mechanism, the facet joint has been linked to persistent discomfort in the lower back. Facet joint pain was shown to be prevalent in up to 75% of persons with low back pain (LBP).[6] Surgery, medication therapy, and physical and rehabilitation interventions are among the several intervention options used to treat low back pain.[7] Exercise therapy, transcutaneous electrical nerve stimulation (TENS), low-level laser therapy(LLLT), individual patient education, massage, behavior treatment, lumbar supports, traction, therapeutic ultrasound, thermotherapy (SWD), EMG biofeedback, spinal manipulations, neural mobilizations, Mc Kenzie exercises, lumbar stabilization exercises, Muscle energy techniques, and various other manual therapy techniques are among the physical and rehabilitation medicine interventions. Physical therapists use a variety of therapies to treat LBP, but the evidence supporting their effectiveness is limited.[8] Stabilization exercise training has been shown to help with LBP management. The purpose of lumbar stabilization training is to obtain optimal dynamic management of lumbar spine forces while avoiding repetitive harm to the spinal segments and surrounding structures.[9] Specific stabilising workouts including co-contraction of the deep abdominal (Transversus Abdominus and Obliquus Internus) and lumbar multifidus muscles have been documented in studies. These are useful in the short and long-term management of LBP in recent clinical trials.[10] According to a recent assessment of several LBP therapies, an active strategy is successful. Another effective technique for managing chronic LBP with facet joint dysfunction is Muscle Energy Technique. However, there is relatively little information about this in the literature. The goal of the study is to see if Muscle Energy Technique along with lumbar stability exercise training is more effective than lumbar stabilization exercise training alone in lowering pain, disability, and reducing the fear-avoidance belief regarding physical activity in patients with chronic low back pain with facet joint dysfunction.

Material and Methods

Aim:

To study the effect of Muscle Energy Technique as an adjunct to Lumbar Stabilisation Exercises training on Pain, Disability and Fear Avoidance belief in Patients with Chronic Low back pain with facet joint dysfunction.

Study setting:

The study will be conducted between April 2022 to September 2022 in physiotherapy OPD of Ravi air physiotherapy college Sawangi (Meghe) Wardha after approval from Institutional Ethics Committee of Datta Meghe Institute Of Medical Sciences, Deemed to be University. The patients will be referred by the orthopedic department of AVBRH Sawangi (Meghe) Wardha. Before inclusion, all the participants will be informed regarding the aim and procedure of research. Those participants who will meet the inclusion criteria must give the written informed consent. The participants diagnosed with with chronic low back pain along with facet joint dysfunction will be enrolled for the study.

Inclusion criteria:

1. Age between 18-40 years
2. Both men and women will be included
3. The subject with chronic low back pain with facet joint dysfunction from last 3 months.
4. NPRS score more than 5.
5. Restricted ROM at lumbar spine.

Exclusion criteria:

1. Any medical red flags (Tumor, Fracture, Metabolic disease, RA, Osteoporosis, Prolonged history of steroid use)
2. Presence of any specific lumbar pathology (Lumbar canal stenosis, Lumbar spondylosis, spondylolisthesis, spondylolysis, Prolapsed intervertebral disk etc.)
3. Evidence of CNS involvement.
4. Prior surgery of the lumbar spine.

Before randomization subjects will be assessed using the questionnaire which will be self-drafted. Information regarding age, sex, occupation, the reason for visit, primary symptoms, additional symptoms, symptom description, duration of symptom, severity, and frequency of symptoms, mechanism of onset, history of recurrence, history of previous treatment, pain behavior, location of pain on body diagram, the intensity of pain, pain on scale and effect of pain on the activity of daily living (ADL) will be obtained from an interview which will contain a series of standard questions.

Group A: In group A, 15 patients will receive muscle energy technique along with lumbar stabilisation exercise therapy.

Muscle Energy Technique:

The MET group's technique is chosen based on the symptoms and diagnosis of the dysfunction's direction, as described in the textbook "Greenman's principles of manual medicine.". The paired transverse processes will be evaluated in neutral, extended, and flexed states as part of the dysfunction diagnostic technique. The transverse processes on both sides will be palpated after palpating the spinous processes to determine the lumbar vertebra level. The levels of transverse processes will be measured first in the neutral position, then in the prone position on the bed. With the patient seated on a stool and their feet on the floor, the fully flexed position will be measured. The limitation with extension, rotation, and side bend (ERS) dysfunction will be detected if the transverse process of one side is more posterior in the flexed position and symmetric in the extended position. The limitation with flexion, rotation, and side bend (FRS) will be identified if one transverse process is more evident in the extended position and symmetric in the fully flexed position. If three or more transverse processes will be evident in all positions, a neutral malfunction will be suspected. With movement barriers, treatment will be in the same direction, but with positional diagnosis, it will be in the opposite direction. The therapist will set up the suitable position and analyse the subject's pain or resistance barrier before beginning the treatment. During treatment, the physical therapist will palpate to keep track of the problem section and muscle contractions at that precise level. Due to the persistent nature of the discomfort, light to moderate active contraction force will be used. The individual will be asked to totally relax the back after the contraction effort, and the therapist will re-engage movement limitation. The patient should be calm and his or her muscles should be stretched to a new resting length before repositioning to a new barrier resistance. These steps will be carried out three to five times.[11]

Following MET, patients will be instructed in lumbar stabilization exercises. Exercise will be used to relearn a precise co-contraction pattern of the deep trunk muscles, including the transversus abdominis and lumbar multifidus muscles, for the LSE group. Abdominal breathing and abdominal hollowing were conducted as part of the warm-up before the activity. Abdominal hollowing, unilateral knee abduction, extension and knee raise, and bilateral knee raise will be performed in the supine position.[12] Each subject's exercise intensities and progressions will be tailored to their capacity to learn to do lumbar stabiliser co-contraction. For both the MET and LSE treatments, it will take about 25 to 30 min to finish the session.

Group B: In group B, 15 patients will receive lumbar stabilization exercise training alone.

Outcome measures:

The patients will complete outcome measures such as numerical pain rating scale, Oswestry disability questionnaire and fear-avoidance belief questionnaire

The numerical pain rating scale is an 11-point scale on which patients assess the severity of their present pain from 0 ("no pain") to 10 ("worst agony possible"); It is used to indicate the current pain intensity as well as the best and worst levels experienced over the past 24 hours. The scale has been shown to have adequate reliability, validity, and responsiveness in patients with LBP.[13]

The participants perceived disability will be assessed by using a modified oswestry disability questionnaire (ODI). The test-retest reliability of the modified ODI is strong (ICC =0.90). The modified ODI consists of ten items scored from 0 to 5, with a higher score indicating more disability. The results will be then converted into a percentage out of 100 where the higher score indicates greater disability.[14]

The patient's fear of pain and beliefs about avoiding activity will be assessed by the fear–avoidance belief questionnaire (FABQ). The FABQ is a self-report instrument that uses a 7-point Likert scale (05completely disagree; 65completely agree) to examine 16 items. A higher score suggests that the fear–avoidance belief is more deeply held. With an ICC range of 0.72–0.91.16, the FABQ is a solid outcome measure for assessing the fear of patients with LBP.[15]

Data collection and statistical analysis:

The baseline characteristics, including means and standard deviations will be described. The mean differences with SD for the end measures of pain on the NPRS, disability on the ODI , and fear avoidance belief questionnaire will be calculated for the time periods of baseline to 2 weeks, and 4 weeks. An unpaired t test will be used to analyse the between-group differences for all three outcome variables (pain intensity, disability, and fear avoidance belief) at each follow-up period. A priori, a 0.05 alpha level will used.

Discussion

The goal of this study is to evaluate the effect of Muscle Energy Technique along with core stabilisation exercises on pain, disability and fear avoidance beleief in patients with chronic low back pain with facet joint dysfunction. The Muscle Energy technique along with Lumbar Stabilisation Exercise traing can be a viable approach for treating chronic non-specific low back pain patient with facetal joint dysfunctions but there is a lact of literature on combined effect of MET and lumbar stabilisation exercise training.

Conclusion

Based on the finding of the study, specific reccomendations will be made on the use of intervention for reducing pain, disability and fear avoidance belief among the patients with chronic low back pain with facet joint dysfunction.

Conflict of interest: Nil

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References

1. Traeger A, Buchbinder R, Harris I, Maher C: Diagnosis and management of low-back pain in primary care. CMAJ Can Med Assoc J J Assoc Medicale Can. 2017, 189:E1386–95. 10.1503/cmaj.170527.
2. Wu A, March L, Zheng X, et al.: Global low back pain prevalence and years lived with disability from 1990 to 2017: estimates from the Global Burden of Disease Study 2017. Ann Transl Med. 2020, 8:299. 10.21037/atm.2020.02.175.
3. Ganesan S, Acharya AS, Chauhan R, Acharya S: Prevalence and Risk Factors for Low Back Pain in 1,355 Young Adults: A Cross-Sectional Study. Asian Spine J. 2017, 11:610–7. 10.4184/asj.2017.11.4.610.
4. Koes BW, van Tulder MW, Thomas S: Diagnosis and treatment of low back pain. BMJ. 2006, 332:1430–4.
5. Allegri M, Montella S, Salici F, et al.: Mechanisms of low back pain: a guide for diagnosis and therapy. F1000Research. 2016, 5:F1000 Faculty Rev-1530. 10.12688/f1000research.8105.2.
6. Perolat R, Kastler A, Nicot B, et al.: Facet joint syndrome: from diagnosis to interventional management. Insights Imaging. 2018, 9:773–89. 10.1007/s13244-018-0638-x.
7. Shipton EA: Physical Therapy Approaches in the Treatment of Low Back Pain. Pain Ther. 2018, 7:127–37. 10.1007/s40122-018-0105-x.
8. Page MJ, Green S, Mrocki MA, et al.: Electrotherapy modalities for rotator cuff disease. Cochrane Database Syst Rev. 2016, CD012225. 10.1002/14651858.CD012225.
9. Studnicka K, Ampat G: Lumbar Stabilization. In: StatPearls. StatPearls Publishing: Treasure Island (FL); 2022.
10. Transversus Abdominis Activation and Timing Improves Following Core Stability Training: A Randomized Trial. Accessed: March 7, 2022. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5717480/.
11. Immediate effects of muscle energy technique and stabilization exercise in patients with chronic low back pain with suspected facet joint origin: A pilot study. Accessed: March 7, 2022. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7526062/.
12. Kim E, Lee H: The Effects of Deep Abdominal Muscle Strengthening Exercises on Respiratory Function and Lumbar Stability. J Phys Ther Sci. 2013, 25:663–5. 10.1589/jpts.25.663.

13. Alghadir AH, Anwer S, Iqbal A, Iqbal ZA: Test-retest reliability, validity, and minimum detectable change of visual analog, numerical rating, and verbal rating scales for measurement of osteoarthritic knee pain. J Pain Res. 2018, 11:851–6. 10.2147/JPR.S158847

14. Fairbank JC, Pynsent PB: The Oswestry Disability Index. Spine. 2000, 25:2940–52; discussion 2952. 10.1097/00007632-200011150-00017

15. Waddell G, Newton M, Henderson I, Somerville D, Main CJ: A Fear-Avoidance Beliefs Questionnaire (FABQ) and the role of fear-avoidance beliefs in chronic low back pain and disability. Pain. 1993, 52:157–68. 10.1016/0304-3959(93)90127-B.