

Comparative Study of Muscle Energy Technique and Mckenzie Therapy in Individuals with Chronic Low Back Pain

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A B S T R A C T

Background: The frequency, rate and discrepancies in diagnosing and managing system of LBP encourage the continuous seeking of the extra environment and friendly cure. Treatment Incorporation of the particulars gained with different management policies for complete plan for individuals seems to be related by tremendous results.

Objective(s): To determine the comparative effects of Muscle Energy Technique and McKenzie therapy in three groups of patient with chronic low back pain

Methodology: This randomized control trial study included 48 males and females participants with chronic (LBP) low back pain. Patients were assessed prior to the interventions and then divided into three groups (16 persons each). Group 1 received Muscle Energy Technique and McKenzie method, Group 2 treated with Muscle Energy Technique and Group 3 with McKenzie therapy. TENS transcutaneous electrical nerve stimulations were applied to all groups. Each of 3 therapeutics protocols was included 10 sessions throughout a 2-week period.

Results: McKenzie approach combined with MET had the best therapeutic results. Application of McKenzie therapy, both alone and mixed with MET, was linked with a noteworthy decline in (MODI) and major improvement of pain (NPR). The outcomes showed that there was considerable difference among three groups with p value <0.05. Combined group (MET plus McKenzie therapy) displayed significant results with mean value of pain 2.58 ± 1.01 and mean value of function 18.38 ± 11.46 .

Conclusion(s): McKenzie approach enriched with Muscle Energy Technique (MET) efficiently applied in the remedy of CLBP. The utilization of the mutual therapy (McKenzie Therapy + Muscle Energy Technique) put forth significant results on outcomes, quality of life improved and intensity of experienced pain.

Introduction

Low back torment is characterized as agony and uneasiness, restricted beneath the costal edge or more the mediocre folds in gluteal region, eluded lower limb torment. In rules, incessant lumbar torment is characterized as lumbar agony enduring, at any rate four months, except if determined in any case. This implies we manage patients that might be described as below acute back torment, patients that gone on for extremely extensive stretches of time and instances of intermittent

agony by which the present scene has gone on for around four months. It includes specific spinal pathology, nerve root torment/radicular torment and vague low back torment.¹

Low back pain is the most predominant type of musculoskeletal ailment. As per numerical records, seventy to eighty five percent of people experience back pain in their life.²⁻³ Patients with back pain get well entirely after a serious occurrence of pain (39-76%), signifying so

as to a substantial portion of them expand into a chronic state.⁴ The researchers and authors have presented different estimations on the LBP because as its etiology is poorly understood. It is stated that 85% LBP cases are undefined and functional.⁵⁻¹⁰ According to the review of observational studies, there is no strong evidence for the possibility of a contributing association among x-rays results and non-specified lumbar region pain.¹¹ The origin of LBP in the majority of cases are not revealed by MRI, CT scans and X-rays as they have the risk of inaccurately positive analyses.¹² It is stated that 47% to 84% of patients with LBP will experience reappearance within one year, because of its high recurrence rate.¹³ The removal of pain, restoration of ROM, functional development, and enhancement of the quality of life are the aims of physiotherapy in patients suffering from chronic LBP. Exercise, spinal manipulation, relaxation techniques, massage therapy and psychotherapy are carried out to accomplish these objectives. The proof of their efficacy is questionable, despite various formerly published studies concerned with a variety of therapeutic modalities of LBP.¹⁴⁻¹⁷ In spite of wide study on this topic, the management of back pain is still a great challenge for medical practitioner as well as for doctor of physiotherapy.¹⁸

The mechanisms of pain production are complicated, new investigative equipment does not fulfill the patients' requirements, and therapeutic outcomes are poor. Only the early and correct diagnosis can prevent acute back pain to become a chronic.¹⁹ McKenzie Therapy is one of treatment protocols used for Low Back Pain. It is composed of spinal pain syndromes treatment, centralization, spinal disc problems and mechanical diagnosis.²⁰⁻²⁷ A research was performed on the sound efficacy of MET and core stability exercises in patients with chronic Low Back Pain. Main outcomes were intensity of pain, disability and lumbar Range of Motion. Randomly, allocated the participants into 4 groups. Group 1 was treated with MET; G2 with Core Stability Exercise, G3 with MET plus Core Stability Exercise and G4 is control group. Visual Analogue Scale was used to measure pain, disability by MOD Questionnaire. The study concluded that the Muscle Energy Technique enriched with Core Stability Exercise is additional advantageous then only MET and Core Stability

Exercise.²⁹⁻³⁶ According to Ajay Kumar and Deepinder Singh in an experimental research, study concluded that Muscle Energy Technique lead reduce intensity of pain and functional disability.²⁸ A retrospective research proofed the worth of TENS (transcutaneous electrical nerve stimulations) for the diminution of pain but still more study on this topic was required to judge efficacy of the protocol.³¹

Methodology

Randomized control trial was used in one of the best (LBP) treating hospital of Sahiwal Langriyal Surgimed Hospital. Study was conducted in 9 months from December 2017 to august 2018. Simple random sampling technique was used via computer. Patients sample size was 48. it was calculated according to the following criteria F tests - MANOVA: Global effects, Options: Pillai V, O'Brien-Shieh Algorithm, Analysis: A priori: Compute required sample size ,Input: Effect size $f^2(V) = 0.25$, α err prob = 0.05, Power ($1-\beta$ err prob) = 0.95, Number of groups = 3, Response variables = 3, Output: Noncentrality parameter $\lambda = 24.0000000$, Critical F = 2.2034393, Numerator df = 6.0000000, Denominator df = 88.0000000, Total sample size = 48, Actual power = 0.9636142, Pillai V = 0.4000000

Inclusive criteria included individuals with history of CLBP at least three months but it should not be less than three months., Both genders, Patients with pain of at least three points as calculated with 0-10 points (NPRS), Age of patient between 18 to 45 year.⁴⁴

Exclusion Criteria included contraindications to physical exercises or TENS, evidence of nerve root compression, serious spinal pathology (like trauma, infectious disease and fracture), cardiovascular and metabolic disease, history of surgery and Pregnancy

Random numbers were generated from 1-50 using an online random numbers generator in three sets. Set one was assigned to group 1 (combined treatment), set two was assigned to group 2 (Muscle Energy Technique) and set three was assigned to group 3 (McKenzie Therapy). Sealed envelope method was used to assign patients in three groups. To determine the relative special effects of McKenzie and Muscle Energy Technique (MET) in patients with chronic low back pain at Langriyal Surgimed Hospital, Sahiwal. Researcher recorded 48 patients with LBP and asked to fill the

consent form. Those who fulfilled the requirement of inclusion criteria were indiscriminately separated into 3 groups. The allocation was done via lottery method while ensuring confidentiality. The treatment plan for all groups was executed by the researcher herself. Assessment

Group 1 received Muscle Energy Technique and McKenzie method. Duration of session was 55 minutes. These interventions were used: hyperextension exercises, hyperextension exercises with pressure applied by patient or by physiotherapist and mobilization (hyperextension). By using a law of force of progression these therapies were applied in sagittal plane. Post isometric relaxation exercises were applied in each session. In this protocol duration of contraction was 7 to 10 seconds, 20 to 35% power of contraction, 3 seconds of rest among sessions of contraction, 3 repetitions, antagonist contracted in end duration, and revert of base line posture. Erector spinae muscles were relaxed. The sessions were performed in a sitting position. Anterior flexion, lateral flexion and rotations were performed. Both parts of erector spines were used to balance the tension of muscles. A home plan was advised (in a day 5 cycles, 15 repetitions with rest of 2 hours)

Group 2 received Muscle Energy Technique (PIR) because it's a gentle technique. The protocol this group was the same as in group 1. The duration of this session was 25min. Moreover, the exercises at home include 5 cycles in a day, 15 repetitions with rest of 2 hours.

Group 3 include McKenzie method. The protocol was the same as in group 1. The duration of session was 45 minutes. Moreover, the exercises at home include 5

cycles in a day, 15 repetitions with rest of 2 hours. TENS transcutaneous electrical nerve stimulations were applied to all groups. On either areas of the lumbar and sacral spinal area the electrodes were placed. Duration of stimulations was 15 minutes, fifty hertz frequency, twenty to thirty milli ampere of current, total duration of particular impulse fifty microseconds.

This study included 48 males and females participants with non-specific chronic LBP (low back pain). Patients were assessed before the interventions and then divided into three groups (16 persons each). Group 1 received McKenzie method plus MET (Muscle Energy Technique), Group 2 received MET (Muscle Energy Technique) and Group 3 included McKenzie therapy. Patients were blinded either they got single treatment (McKenzie Therapy or Muscle Energy Technique) or combined treatment (both McKenzie Therapy and Muscle Energy Technique). TENS transcutaneous electrical nerve stimulations were applied to all groups. Each of 3 therapeutics protocols was included 10 sessions throughout a 2-week period. All the outcomes were examined before treatment, 24 hours after the treatment and followed up after one month. After Assessing normality by Shapiro Wilk Test, p-value was greater than ($P > 0.05$) that showed data was normally distributed.

Results

There is a significant distinction between Pre, Post and follow up treatment of back pain Mixed Model ANOVA was applied. And the outcomes showed that there was considerable difference among three groups with p value < 0.05 . Combined group (MET plus McKenzie

Variables	Groups	Pre Mean $\pm$ SD	Post 1 Mean $\pm$ S.D	Post 2 Mean $\pm$ S.D	Follow Up Mean $\pm$ S.D	p-value within group	p-value between groups
Pain	Combination of METS and McKenzie therapy	7.88 $\pm$ 1.48	7.88 $\pm$ 1.48	3.11 $\pm$ 1.24	2.58 $\pm$ 1.01	0.000	0.000
	Muscle energy techniques	8.56 $\pm$ 0.54	8.56 $\pm$ 0.54	7.42 $\pm$ 0.99	7.14 $\pm$ 1.80	0.002	
	McKenzie therapy	6.63 $\pm$ 1.67	6.63 $\pm$ 1.67	5.42 $\pm$ 1.28	5.31 $\pm$ 2.09	0.043	
	p-value	0.001	.001	0.000	0.000		
Function	Combination of METS and McKenzie therapy	77.25 $\pm$ 16.30	77.25 $\pm$ 16.30	24.62 $\pm$ 14.73	18.38 $\pm$ 11.46	0.000	0.005
	Muscle energy technique	92.00 $\pm$ 8.00	92.00 $\pm$ 8.00	57.50 $\pm$ 12.68	64.88 $\pm$ 20.50	0.001	
	McKenzie therapy	70.00 $\pm$ 21.15	70.00 $\pm$ 21.15	47.38 $\pm$ 19.14	48.44 $\pm$ 22.07	0.000	
	p-value	0.001	0.001	0.000	0.005		

Table II: Comparison of Socio-Demographic Variables of three Groups				
Study Group		N	Mean± Std. Deviation	P-Value
Age of Participants	Combination of METS and McKenzie therapy	16	29.13±9.31	0.590
	Muscle energy techniques	16	30.50± 7.04	
	McKenzie therapy	16	27.69±6.45	
BMI	Combination of METS and McKenzie therapy	16	27.25±5.48	0.887
	Muscle energy techniques	16	26.50±5.06	
	McKenzie therapy	16	27.31±5.10	

therapy) displayed significant results with mean value of pain 2.58 ± 1.01 and mean value of function 18.38 ± 11.46 . The tremendous outcomes of bivariate interplay (Time x Method) of the carried out therapeutic techniques applied inconsistent time-dependent impact on MODI (disability questionnaire), intensity of pain and the practical considerations of the spine. (Table no I).

Table II represents contrast of socio-demographic variables like Age and BMI in three management groups. These three groups on the basis of Age and BMI with $p\text{-value} > 0.05$ in this table showed the similarity.

Discussion

The numerous considers approving the adequacy of mutual helpful strategies and methods are in adequate.⁴⁴⁻⁴⁷ Wil son et al. accomplished that Muscle energy technique is an ideal add on procedure for other therapeutic modalities. Numerous ponders affirmed the positive impact of McKenzie therapy.⁴⁹⁻⁵⁰ So also, a body of prove affirms the restorative esteem of MET.⁵¹⁻⁵² In addition, both the methods reported positive results in patients with LBP (low back pain).⁵³⁻⁵⁴ In any case, to the leading of our information, none of the past researches confirmed whether the mixture of these approaches makes strides the helpful conclusions.

Markedly, both of the treatments are centered on diverse ideas and include distinctive restorative strategies. The McKenzie therapy is tilting at the supervision of all anatomical problems of the spine.³⁷⁻⁴³ Purpose of the treatment is to dispose of torment and standardize the work of influenced spinal fragment.²⁰ Subsequently; the main focus of McKenzie strategy is based on the treatment of spinal problems. Evaluation of the NPRS proposes that mutual therapy (McKenzie therapy plus Muscle Energy Technique) and McKenzie therapy alone created the strongest therapeutic results

that are considerable reduction of pain. Application of these strategies was mirrored by obvious intensification of pain, without any big intergroup distinctions. On the other hand, Muscle Energy Technique decreased ache to a least degree, and no great differences were determined between NPRS ratings acquired before and after this procedure.

The rankings of Modified Oswestry Disability Index additionally fluctuated depending on the kind of carried out procedure. Mutual application of McKenzie therapy and MET, used to be reflected with the aid of a large minimize in disability (MODI). No good distinctions had been recognized between the special effects of these two interventions. While the group treated with Muscle Energy Technique reported least outcome of the ODI.

A study of Pain Numeric Rated tool values put forward that the groups treated with mutual techniques (Muscle Energy Technique plus McKenzie method) and only McKenzie approach proposes the strongest therapeutic results that is reduction of pain.

These methods used to be reflected by way of obvious intensification of knowledgeable pain, without any substantial intergroup distinctions. While the group treated with Muscle Energy Technique reported least effect and no great distinctions had been found among NPR status, obtained before and after this procedure. However, different medical problems, with recurring unenthusiastic motor patterns, are also mirrored by the musculoskeletal system disorders. This can be reproduced by making definite compensatory mechanisms, motor restrictions and functional disorders. However, the musculoskeletal treatment is not a part of thought of McKenzie therapy. consequently, the aspire of counting the muscle energy techniques (MET) in the projected procedure of mutual therapy was to potentiate its therapeutic outcome through the stretching of muscles to get relaxation, making strong the destabilized muscles, diminution of passive muscular

tone, perfection of movement of joint, and motor pattern development.

A study of past ten years recommends that both Manual Techniques and exercise as a suitable treatment for LBP (chronic). There is some proof in the favor of manual therapy for instant special effects like pain reduce secondary to an analgesic result that it may suggest. Nevertheless, when in contrast there is slight to no distinction among the two. While, a significant number of studies concluded that exercise being bit more advantageous for immediate and long term effects like in the current study there is a significant distinction between Pre, Post and follow up treatment of back pain Mixed Model ANOVA was applied. The outcomes showed that there was considerable difference among three groups with p value <0.05. Combined group (MET plus McKenzie therapy) displayed significant results with mean value of pain 2.58 ± 1.01 and mean value of function 18.38 ± 11.46 . Other researches entail that using both (Muscle Energy Technique and McKenzie therapy) in combination for Chronic Low Back Pain treatment is superior to just one or the other. Finally, it will come down to physiotherapist and patient liking, which is also supported by competence, care and cost effectiveness which should have the main concern. Many articles suggest that McKenzie therapy combined with Muscle Energy Technique gives beneficial results than alone McKenzie therapy or Muscle Energy Technique.

Chronic LBP has a various diagnosis and its needs several modes of management.³² The proof of beneficial results should not be bounded to the findings of radiology, also be imitated by function of a patient, intensity of ache, range of mobility, and correction of motor pattern and it was also proofed from current study and past studies that Muscle Energy Technique and McKenzie therapy in combination provides relief of pain and help patient to live an independent life.

Conclusion

Contrast of the results of three therapeutic ways, MC Kenzie therapy, Muscle Energy Technique (MET) and Muscle Energy Technique mixed with MC kenzie therapy in patients with chronic LBP proposes that the mutual therapy is mainly helpful.

The utilization of the mutual therapy (McKenzie Therapy + Muscle Energy Technique) put forth significant results on

outcomes, quality of life improved and intensity of experienced pain.

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