

EFFICACY OF MCKENZIE EXERCISE OVER CONVENTIONAL PHYSIOTHERAPY TREATMENT IN LOW BACK PAIN [DYSFUNCTION SYNDROME]

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Abstract -

INTRODUCTION: Low back pain is a common reason for seeing a physiotherapist in primary care. The goal for the therapist managing these patients is to select the appropriate treatment for each patient. The medical professionals in primary care most commonly classify these patients with patho-anatomically labeled categories. However, there appears to be a wide diversity in the opinion as to the pattern of signs and symptoms. There is strong evidence that exercise therapy is more effective than usual care by general practitioners, and that exercise therapy and conventional physiotherapy (consisting of a combination of hot packs, massage, traction, mobilization, short wave diathermy, ultrasound etc.) are equally effective for the treatment of these patients. McKenzie extension exercises help in reducing the pain and increase the mobility as compared to the conventional physiotherapy treatment alone.

AIMS & OBJECTIVE: Present study done to compare efficacy of McKenzie extension exercise over conventional method of short wave diathermy in extension dysfunction syndrome.

MATERIAL & METHOD: Total 30 samples patients of age 35-50 years were selected. Patients with complaint of low back pain were further assessed to diagnose extension dysfunction syndrome. Study by randomized technique was adopted. Patients kept under control group received short wave diathermy only whereas patients kept in experimental group received McKenzie extension exercise in addition to short wave diathermy. With the help of VAS (Visual analogue scale) for pain, relief in

extension pain assessed in both groups on 1st, 5th, 10th & 15th day of treatment. Test used- independent 't' test using SPSS & Graph Pad instat3 (trial version)

RESULT: The mean improvement between the initial & final scores of the control group was 4.06 ± 1.24 and that of experimental group was 3.45 ± 1.08 and on calculation the 't' value was found to be 3.24 hence $p < 0.05$ which implies that there was significant difference between two groups

CONCLUSION: There was definite decrease in value of VAS in both the groups but there was more significant improvement in experimental group in comparison to the control group. It may be quite safely stated that McKenzie technique is an effective, scientific and economical method for reducing dysfunction pain.

KEY WORDS: Low back pain, Dysfunction syndrome, Short wave diathermy, McKenzie exercise, VAS

INTRODUCTION -

Low back pain is a common musculoskeletal disorder affecting 80% of people at some point in their lives. The lumbar vertebral column comprises of five vertebrae and the intervening intervertebral discs. The intervertebral discs play a vital role in the functioning of the spine.^[1] The permitting motions between vertebral bodies are Translational motion in the long axis of the spine Rotary motion about a vertical axis Antero-posterior bending and Lateral bending.^[2] The orientation of zygapophyseal facets from L1 to L4 limits lateral flexion and rotation. When the lumbar spine is flexed, the Range of Motion in rotation is less than when the lumbar spine is in the neutral position. The orientation of the lumbar zygapophyseal facets favours forward flexion and backward extension.^[3] The amount of flexion varies at each inter-space of the lumbar vertebrae, but most of the flexion takes place at the lumbo-sacral joint. The average range of flexion is 8 degrees at L1/L2, 9 degrees at L2/L3 and 12 degrees at L3/L4 and L4/L5.^[4]

Pain in the low back area is a common reason for seeing a medical & physical therapist. Mechanical or



musculoskeletal problems underlie most complaints (around 90% or more) and of those, a majority (70% to 85%) do not have a specific cause identified, but are attributed to general muscle strain or injury to ligaments. An injury can also occur to one of the intervertebral discs (disc tear, disc herniation). Ligament and joint functionality also diminishes as one ages. Pain is also generated through lumbar spinal stenosis, sciatica and scoliosis. Low back pain may also result from general systemic or psychological problems. Low back pain can be classified further based on signs and symptoms.

Nonspecific – the most common type of diffuse pain that does not change in response to particular movements, is localized & non-radiating.^[1]

Radicular- pain which radiates down the leg below the knee, may be unilateral or bilateral and changes in intensity in response to particular positions or maneuvers^[1]. Generally pain lasting less than six weeks is classified as acute, pain lasting six to 12 weeks is sub acute, and more than 12 weeks is chronic.^[3]

Acute LBP tends towards becoming a complex chronic pain disorder; involving anatomical, physiological, psychological and social aspects^[4]. McKenzie subsequently classified mechanical LBP into three syndromes- postural, dysfunction and derangement syndromes^[5].

Postural syndromes – back pain or neck pain caused by continued stress of soft tissues while maintaining certain postures or positions.

Derangement syndromes - back pain or neck pain caused by a change in position of the vertebrae enclosing a disc due to repositioning of the fluid nucleus of the disc; pain will change with repeated motion.

Dysfunction syndromes: intermittent back pain and limited movement caused by the presence of scar tissue in a shortened state; back pain occurs when these tissues are stressed^[5]. However, there appears to be a wide diversity in the opinion as to the patterns of signs and symptoms that constitute a category^[6].

Physicians and therapists believe that disability related to LBP must be viewed as a multi-factorial problem. Barr et al, (2005) in their review on lumbar stabilization submitted that the multifidus and transverse abdominis muscles are major stabilizers of the spine^[7].

Physical therapy includes massage, ultrasound and electrical stimulation. Active therapies can consist of stretching, strengthening and aerobic exercises. Exercise therapy appears to be the most often-used physical therapy intervention in treating people with back pain^[8]. It aims at abolishing pain, restoring and maintaining full range of motion, improving the strength and endurance.^[8,9] Exercising to restore motion and strength to the lower back can be very helpful in relieving pain and preventing future episodes of low back pain.^[10] Medical therapy includes anti-inflammatory medications, muscle relaxants to relieve the symptoms.^[11,12] There are strong evidences that exercise therapy is more effective than usual care by general practitioners. The McKenzie-method of Mechanical Diagnosis and Therapy (MDT) is widely used within primary care. McKenzie treatment prescribes a series of individualized exercises. It has been reported as the most commonly used method by physiotherapists for the management of patients with LBP.^[13-15]

RESEARCH DESIGN & METHODOLOGY:

Sample - Minimum Sample size of 30 patients was taken who either referred to or attended Physiotherapy OPD with the complaint of low back pain. They were further assessed in the department to select them as subjects for study on Extension Dysfunction Syndrome by Extension Test Movement. In this test, patient's pain was produced at the point of full stretch in extension, which was restricted in range of motion due to pain. The study was conducted in the Department of Physiotherapy, Vikhe Patil Memorial Hospital, Viladghat Ahmednagar.

Patients were selected into the study after fulfilling the criteria of being the part and were randomly divided into control and experimental groups.



INCLUSION CRITERIA	EXCLUSION CRITERIA
1. Age group 35-50 years	1. Patients with acute pain who can't stand or walk.
2. Patients with sub acute & chronic pain dysfunction syndrome.	2. Patients with sciatica & neurological deficit.
3. Patients with accompanying limitation of extension movement.	3. Patients of postural and derangement syndrome.
4. Both male and female patients.	4. Patients with bony anomalies.
	5. Patients where no movement or position lessens their symptoms.

STUDY DESIGN: Subjects selected for the part of study were explained about the procedure and the consent of patient taken for being a subject in the study. Since the study was Quasi experimental in nature, randomized sampling technique was adopted to select the subjects Patients were randomly divided into either control or experimental group according to their consent for additional McKenzie exercise. In order to compare level of significance of two methods, study was designed and data collected to analyze statistically.

The control group (15 patients) received conventional treatment of (SWD) Short wave Diathermy used with pad electrodes for a period of 20 minutes in supine lying with coplanar method of application. Thereafter patients were advised next day appointment. Whereas the Experimental group (15 patients) received the same treatment line with addition of McKenzie extension exercises for 10 repetitions in each set with 10 sets per day. The patients were assessed on 1st, 5th, 10th and 15th day with VAS.

VAS (visual analog scale): measure variation in back pain. The intensity of pain recorded using a visual analogue scale ranging from no pain to maximum pain. Rosenberg N et al (2004) suggest that

evaluation of patients according to visual analogue scale of pain is an accurate measurement.^[12] Patient was asked to mark the point where they rated his pain. Four measures were taken, pre treatment value on day one before treatment commenced and subsequent readings were taken at the end of 1st, 5th, 10th & 15th day.

Technique, Modalities & Materials used

McKenzie technique in prone : The patient lying in prone position places his hands [palms down] near the shoulders as for traditional press up exercise. He now presses the top half of his body up by straightening his arms while the bottom half from the pelvis down is allowed to sag with gravity. The top half of the body is then lowered and exercise is repeated about ten times. The first two or three movements are done with caution then remaining extension presses may become successively stronger until the last movement is made to the maximum possible extension range. Reliability & validity : Same study was conducted by Helen A Clare et al (2004)^[16] where a systematic review of randomized clinical trials was conducted to investigate the efficacy of McKenzie therapy in the treatment of spinal pain. This review shows that for low back pain patients McKenzie therapy does result in a greater decrease in pain and disability in the short term than do other standard therapies.

Short wave Diathermy: Power-500 Watts, each session of 20 minutes with sub thermal dose, coplanar method of electrode placement in the lumbar region in supine position. Reliability & validity: in an Indian study by H N Debsarma concluded that deep heat modality (SWD) is more effective than superficial heat in pain management in LBP patients, however, infrared therapy may not be more appropriate when deep heat is given.^[17]

Recordable materials: Assessment form sheets, VAS data collection form, consent form and essential stationary material.

Plinth: For teaching exercises a wooden plinth with head raise facility is used



Stepper: A two-step stepper is used to sit on plinth

Data Analysis

Group 'A' –Experimental group

Group 'B'-Control group

Table I: Description of VAS for 1st, 5th, 10th, and 15th day.

Table No 1: Comparison of fasciculation in three groups-

Group	1st day Mean ± S.D.	5th day Mean ±S.D.	10th day Mean ±S.D.	15th day Mean ±S.D.
Group A	5.75 ±1.35	5.25 ±1.31	4.41 ±1.14	3.45 ±1.08
Group B	5.61 ±1.21	5.25 ±1.21	4.71 ±1.20	4.06 ±1.24

TABLE II-'t' test between group A & group B

Group	1ST DAY		5TH DAY		10TH DAY		15TH DAY	
	't' value	'p' value	't' value	'p' value	't' value	'p' value	't' value	'p' value
GROUP A Vs GROUP B	1.90	>0.05	3.07	<0.05	2.33	<0.05	3.24	<0.05

Statistical analysis: Independent 't' test done, using SPSS & Graph Pad Instat3 (trial version).

RESULT : As per above data analysis a definite reduction in pain was seen. Independent "t" test was done. The 't' value is 15.41 hence $p < 0.05$. This implies there is significant improvement in the score of VAS of Experimental group; the maximum was being on 15th day. In Control group the values given above also showed definite reduction in pain, the 't' value is 13.18, hence $p < 0.05$ which implies there was significant improvement in the score of VAS, maximum was on 15th day. The mean improvement between the initial & final scores of the control group was 4.06 ± 1.24 and that of experimental group was 3.45 ± 1.08 and on calculation the 't' value was found to be 3.24 hence $p < 0.05$ which implies that there was significant difference between two groups. Considering in total it was seen that there was definite decrease in value of VAS in both the groups but there was more significant

improvement in experimental group in comparison to the control group.

DISCUSSION : Patients with Dysfunction syndrome are individuals who are believed to have had trauma or a postural problem producing adaptive shortening of the soft tissues. Pain is triggered by over use, posture is poor, movement in the spine is restricted and there is pain at the end range^[18].

McKenzie exercises for low back pain are beneficial treatment for increasing flexibility of spine and improving the pain with better relief.^[19] The McKenzie method and intensive dynamic strengthening training seems to be equally effective in the treatment of patients with sub acute or chronic low back pain.^[20] There is some evidence that the McKenzie method is more effective than passive therapy for acute LBP; however, the magnitude of the difference suggests the absence of clinically worthwhile effects. There is limited evidence for the use of McKenzie method in chronic LBP.



The effectiveness of classification-based McKenzie therapy is yet to be established.^[21] In present study, patient's pain on extension reduced significantly in comparison to day one when patient came with complaint of low backache with limited extension. According to a study there was no difference for any outcomes between the flexion or extension exercise groups. However, either exercise was slightly more effective than no exercise when patients with acute low back pain were treated.^[22] Johnson et al (2010) compared the efficacy of McKenzie exercise, endurance training and back care education and concluded that McKenzie exercise was effective in modulating long-term LBP and proposed that a combination therapy involving McKenzie exercise and endurance training was more effective.^[23] Therapies with good evidence of moderate efficacy for chronic or sub acute low back pain are cognitive-behavioral therapy, exercise, spinal manipulation, and interdisciplinary rehabilitation. For acute low back pain, the only therapy with good evidence of efficacy is superficial heat.^[24] In present study, it was seen that patient receiving only short wave diathermy had less reduction in pain whereas those receiving McKenzie extension exercise in addition to conventional short wave diathermy had better pain relief during extension movement.

In spite of every effort there are few limitations of this study that include short duration of the study & continued effect of the treatment was not known as there was no follow up of patients on long term basis. Therefore there is still further scope for the study to be conducted on long term basis.

CONCLUSION - McKenzie technique, with its unique assessment, treatment technique aimed at centralization of pain and correction of lateral shift, combined with self-mobilization exercises and customary home therapy helps overcome most syndromes of low back pain including dysfunction. An effective rehabilitation program capitalizes on this potential and encourages the functional activities. It helps in increasing the excursion of the spine by reducing the pain and helps the patient to restore the activities much earlier than the

conventional therapy allows. It may be quite safely stated that McKenzie technique is an effective, scientific and economical method for reducing dysfunction pain and movement loss occurring due to degenerative changes and adaptive shortening in the lumbar spine. The present work substantiates the common observation of the studies that in all techniques of this approach, back care program on biomechanical principles and maintenance of lumbar lordosis are essential. The basis of treatment is training of self-corrective postural exercises. The McKenzie method has gained popularity and has proved objectively effective in various conditions.

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INVENTOR OF STETHOSCOPE- Rene-Theophile-Hyacinthe Laennec

Born on- 17 February 1781

Died on - 13 August 1826

French physician.

1816- He invented the

stethoscope while working at the

Hôpital Necker