



EFFECTIVENESS OF MCKENZIE EXERCISE ON CHRONIC LOW BACK PAIN

Physiotherapy

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ABSTRACT

Chronic low back pain may be the result of many conditions. It may start from diseases, injuries or stress to a number of anatomical structures including bones, muscles, ligaments, joints, of the spinal cord. In general, it is believed that the nerve pathways carry the pain signals from the nerve endings through the spinal cord and to the brain may become sensitized. Methodology: A convenience samples of 10 subjects taken from this study and fulfill the selection of criteria with collected the informed consent form. Outcome measures: Visual Analogue Scale, Oswestry disability index. This study was conducted to evaluate the effectiveness of Mckenzie exercise in reducing pain and disability chronic low back pain. Patients were selected for the study and were given Mckenzie exercise for a period of 5 days in a week disability 3 weeks.

KEYWORDS

INTRODUCTION

Chronic low back pain may be the result of many conditions. It may start from diseases, injuries or stress to a number of anatomical structures including bones, muscles, ligaments, joints, of the spinal cord. In general, it is believed that the nerve pathways carry the pain signals from the nerve endings through the spinal cord and to the brain may become sensitized. Sensitization of these pathways may increase the frequency or intensity with which pain is perceived. Sometimes even after the original injury or disease process has healed, sensitized pathways continue to send signals to the brain. These signals feel just as real as and sometimes' worse than the pain caused by the original injury or disease process.

The cause of chronic low back pain may be perceived as bone pain, neural pain or muscular pain. The impression of pain may be aches, burning pain, stabbing pain or tingling type of pain, sharp excruciating or dull aches and sometimes well- defined or indefinite secondary to an injury, pathology condition and disease or stresses on various structures in the human body. Usual symptoms are pain, stiffness, and deformity in the back and pain, paraesthesia or weakness in the lower limbs. Pain either sharp and localized or chronic and diffuse, is the commonest presenting Symptom. Backache is usually felt down and either side of the midline, often extending into the upper part of the buttock. Some low back pain can be caused due to damaged inter vertebral discs, and the straight leg raise (SLR) is useful to identify this cause. The type of pain may vary greatly and maybe felt as bone pain, muscle pain, or nerve pain. Many times the source of the pain is not known or cannot be specifically identified. In fact, in many, circumstances, the condition or injury that triggered the pain maybe completely healed and undetectable, but the pain may still continue to bother the patient. The back muscles play along with the abdominal, the gluteal & the leg muscles an important role in the etiology of low back pain. Studies suggests that the multifidus & paraspinal muscle groups are significantly smaller in patients with chronic low back pain than in control patients who are healthy & on the symptomatic side of patients with chronic unilateral low back pain compared with the asymptomatic side. Ageing, injury or trauma may cause the annulus fibrosus to tear resulting in protrusion of the nucleus pulposus. This may compress the spinal nerves and/or spinal canal. The bulging disc may even break open releasing the gelatinous material, which is a chemical irritant, causing inflammation of the spinal nerves.

Testing may include blood tests, radiography (X-ray imaging), bone scans, computed tomography(CT)scans, magnetic resonance imaging (MRI), diagnostic injections, electromyography (EMG) and many other specialized tests nevertheless an evaluation is successful if it has ruled out those processes that place the patient at risk if they are not treated.

Visual analogue scales are commonly used in clinical trials and other studies as primary or secondary outcomes or as a tool to derive a health utility index.

The Oswestry is a self-report measure of perceived low back pain

related disability. The questionnaire consists of 10 sections which each contain six statements representing increasing levels of disability on that dimension or in the case of section one, pain intensity. The questionnaire can be filled by the patient and then scored by the therapist in approximately 5 minutes.

Common physical therapy protocols for LBP include stretching or flexibility, neurodynamic therapy, manual therapy, core muscle stabilization exercise, postural/balance exercise, direction-based therapeutic exercise, heating modalities and education/review of home exercise programs. Iliopsoas/rectus femoris stretching can be very useful if there is a significantly tight hip flexor leading to anterior pelvic rotation, which, in turn, promotes lumbar lordosis therefore aggravating symptoms of spinal stenosis and facet arthropathy.

The McKenzie method of Mechanical Diagnosis and Therapy (MDT) is an internationally acclaimed method of assessment and treatment for spinal and extremity pain developed by New Zealand physiotherapist Robin McKenzie. It has been widely used all over the world for more than 30 years.

MDT is a philosophy of active patient involvement and education that is trusted and is used by clinicians and patients all over the world for back, neck, and extremity problems. This approach continues to be one of the most researched physical therapy based methods available.

Aim of the Study

- This study was aimed to create an awareness about the effects of McKenzie exercises on pain and disability among chronic low back pain patients.

Objectives of the Study

- To find out the effectiveness of McKenzie exercise on pain among patients with chronic low back pain.
- To find out the effectiveness of McKenzie exercises on disability among patients with chronic low back pain.

METHODOLOGY

Study Design

Pre and post-test experimental design.

Study Setting

The study was conducted in Outpatient department of Sir Issac Newton college of physiotherapy, pappakovil, Nagapattinam.

Sampling Method

10 patients who fulfilled the inclusion and exclusion criteria were randomly selected and treated with McKenzie exercise.

Variables

Dependent Variables

- Pain
- Disability

Independent Variables

- McKenzie Exercise

Measurement Tools

Variables	Tools
Pain	Visual Analogue Scale
Range of motion	Oswestry disability index

Duration of Study

The duration of the study was 3 months

Inclusion Criteria

- Clinically diagnosed low back pain patients.
- People between the age of 30-50 years.
- Patients who were clinically stable.
- Both males and females were included.

Exclusion of Criteria

- Patients who have cardiac problems.
- Patients associated with medical conditions which limits exercise tolerance.
- Non co-operative patients.
- Mentally unstable patients.
- Cauda equina syndrome.
- Infection.
- Recent fracture of the vertebrae.
- Whiplash associated disorders.

Orientation to the Patients

Before the collection of data all the subjects were explained about the purpose of the study. The concern and full cooperation of each participant was sought after complete explanation of the condition and demonstration of the procedure involved this study

Test of Administration**Visual Analogue Scale**

It was used for the measurement of pain. It assessed the pain severity by asking the subjects to indicate the present level of pain. Equipment required; a strip of paper on which there was a horizontal line of 10 cm length. The numbers 0 to 10 were marked on the line with 1 cm width between each number. 0 was on one end of the line and 10 was on the other end of the line Pain assessed by visual analogue scale. The numbers represented by the degree of pain intensity, 0 indicated no pain and 10 indicated maximum pain. The patient was asked to mark the number in the line at the point corresponding to the intensity of pain at that very moment.



Figure:3.1 Visual Analogue Scale Oswestry Disability Index

Oswestry disability index questionnaire was given to the patients and clearly explained about 24 the items were given in the questionnaire. Patients were asked to mark in the items and the scores were recorded. From 0 [no pain],to 5 (severe pain) the maximum score is 100.

Treatment Procedure

10 patients with chronic low back pain who fulfilled inclusion and exclusion criteria were taken for the study. All patients underwent a pre-test and post-test assessment of pain by using visual analogue scale and disability by using Oswestry disability index for functional disability respectively.

McKenzie Exercises

During the McKenzie physical examination, patients are taken through provocative loading strategies (movements) that help classify the patient and determine the best treatment approach. These movements are intended to either increase or decrease symptoms, patient may be asked to perform single and/or repeated extension movements. These movements are done to 'end range'- the point at which the patient's range is limited for any reason and are done both in standing and lying positions. These loading strategies may abolish symptoms, identify symptoms that occur only in certain positions, or cause symptoms to become either more central or peripheral.

Dynamic Strategies

Dynamic loading strategies include repeated movements performed in different directions. While performing these repeated movements, patients are asked to report any changes to the intensity and/or location of the pain, such as centralization. The therapist also assesses a potential increase or decrease in the spinal range of motion.

Extension in Prone Lying

Ask the patient to lay prone lying with arm besides the body and head turned to one side and maintain the position for 4-5 minutes. In the same position, the patient is asked to place the elbows under the shoulder so that the patient lean on their forearms and maintain the position for 5 minutes. The patient is then advised to extend the elbows in above position and push the top half of the body as far as the pain permits. The patient holds the position for a second or two and then come back to the starting position.

Patient Position: Prone lying

Figure:3.2 Extension in Prone Lying

Extension in Standing

The patient is asked to stand upright with feet slightly apart, hands placed at the back so that the fingers are pointed backward and the thumbs forward. The patient bends backward at the waist as far as keeping the knees straight,maintaining this position for a second or two and return to the starting position.

Patient Position: Standing Upright

Figure:3.3 Extension in Standing

Flexion in Supine Lying

The patient is asked to lay supine with knees bent and foot placed on the couch. From this position the patient brings both the knees towards the chest and gently but firmly pulls the knees with hands towards the chest. The patient maintain this position for 1-2 seconds and return to starting position.

Patient Position:Supine lying



Figure:3.4 Flexion in Supine

Flexion in Sitting

Patient sit on the edge of a chair with knees and feet well apart and hands resting in between legs. From this position the patient bends forward and returns back.

Patient Position: Sitting



Figure:3.5 Flexion in Sitting

Collection of Data

The 10 chronic low back pain patients were selected for the study. Before and after completion of treatment interventions, pain and disability was evaluated by visual analogue scale and Oswestry disability index. The treatment duration was 5 days in a week for 3 weeks per patient.

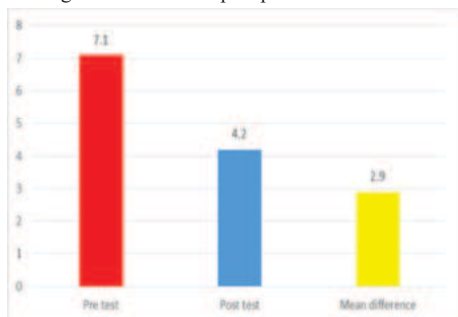
Data Analysis

Table 1 Mean Value, Mean Difference, Standard Deviation and Paired 't' Value Between Pre and Post Test Scores for Pain.

Measureme nt	Mean	Mean Difference	Standard deviation	Paired 't' value
Pre test	7.1	2.9	0.46	20.6*
Post test	4.2			

*0.005 level of significance

The calculated paired 't' value is 20.6 and 't' table value is 3.250 at 0.005 level of significance. Since the calculated 't' value is more than 't' table, there is significant difference in pain following McKenzie exercise among chronic low back pain patients.



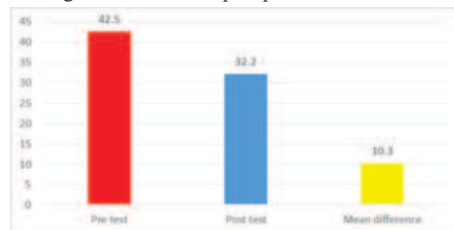
Graph:1 Graphical Representation of Pre and Post Values of Pain.

Table 2 Mean Value, Mean Difference, Standard Deviation and Paired 't' Value Between Pre and Post Test Scores Disability

Measureme nt	Mean	Mean difference	Standard deviation	Paired 't' value
Pre test	42.5	10.3	3.4	9.5*
Post test	32.2			

*0.005 level of significance

The calculated paired 't' value is 9.5 and 't' table value is 3.250 at 0.005 level of significance. Since the calculated 't' value is more than 't' table, there is significant difference in disability following McKenzie exercise among chronic low back pain patient.



Graph:2 Graphical Representation of Pre and Post Values of Oswestry Disability Index

RESULTS

10 chronic low back pain patient were selected and treated with McKenzie exercise. The pain and disability were assessed by visual analogue scale and Oswestry disability index before and after the inclusion.

Analysis of Dependent Variables in Pain: The calculated paired 't' value is 20.6 and the 't' table value is at 3.250 level of significance. Since the calculated 't' value is more than the 't' table value, there is significant difference in pain among chronic low back pain patients.

Analysis of Dependent Variable in Disability: The calculated paired 't' value is 9.5 and the 't' table value is at 3.250 level of significance. Since the calculated 't' value is more than the 't' table value, there is significant difference in disability among chronic low back pain patients.

DISCUSSION

Chronic Low Back Pain is when low back pain has been existing for more than three consecutive months. It may start with a history of an injury, spinal ailment or stresses on diverse structures of body. Low back pain is coined when there is pain, protective spasm and muscular tension, or stiff movement localized to low back, and is well-defined as chronic low back pain when it continues for 12 weeks or longer duration.

The aim of the study was to find one the effectiveness of McKenzie exercise in The management of pain and disability among chronic low back pain patient. 10 low back pain patient were taken and treated with McKenzie exercise.

The result of the present study was showed better improvement in pain and disability among low back patient following McKenzie exercise.

The result was supported by Brian et al., 2006 conducted a study on the effectiveness of McKenzie therapy on improving outcomes of back pain. In this study the subjects primary complain was non-specific low back pain with or without radiation to the extremities. They concluded that McKenzie therapy resulted in a decreasing in short term pain and disability for low back pain patients compared with other standard treatments.

McKenzie exercises for low back are beneficial treatment for increasing flexibility of spine, reduce pain, minimize the number of recurring pain.

Hence hypothes 1 was rejected, 2 accepted.

CONCLUSION

This study was conducted to evaluate the effectiveness of McKenzie exercise in reducing pain and disability chronic low back pain. Patients were selected for the study and were given McKenzie exercise for a period of 5 days in a week disability 3 weeks. Pain and lumbar flexion

range of motion were assessed before and after the study using Visual analogue scale and Oswestry disability index respectively.

From the results it can be concluded that McKenzie exercise is effective in reducing pain and disability among chronic low back pain patients.

Limitations And Suggestion

Limitations

- The study group was small in size.
- The study was limited to age group.
- The study did not include follow-up.

Suggestions

- The study can be done with more number of patients.
- The study can be conducted for other age groups.
- Study can be done for longer duration.

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