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Effect of McKenzie Extension Exercises on Pain and Lumbar Mobility in a 45-Year-Old Male Farmer with Chronic Low Back Pain: Case Study

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ABSTRACT

Background: Chronic low back pain is the most frequent musculoskeletal problem which might significantly affect the mobility, quality of life and occupational performance. Farmers have a lot of exposure to prolonged bending, lifting and other physically intensive activities which can lead to chronic low back pain.

Case Description: A 42 years old male farmer, suffering from chronic low back pain for the period of 8 months, especially while performing prolonged bending, lifting, and farm work was seen at our outpatient department. Physical examination revealed limitation of lumbar spine movement, pain during flexion, weakness of trunk muscles and hips. Intervention: A 8-week physiotherapy rehabilitation program including McKenzie extension exercises was done on the patient.

Outcome: The Numeric Pain Rating Scale (NPRS), Oswestry Disability Index (ODI), lumbar spine movement range, Modified Schober Test, Manual Muscle Testing and Patient Specific Functional Scale (PSFS) were used for the evaluation of patients improvement. After rehabilitation, improvement in pain intensity, lumbar spine mobility, muscle strength, functional activity, tolerance to occupational activities was observed.

Conclusion: In conclusion, McKenzie extension exercise program, strengthening, postural correction and functional rehabilitation can be helpful in treating mechanical chronic low back pain. Structured rehabilitation program can improve functional independence and allow safe return to agriculture-related activities.

Keywords: Chronic Low Back Pain; McKenzie Extension Exercises; Physiotherapy; Lumbar Spine; Farmer; Exercise Therapy; Rehabilitation; Functional Disability; Postural Correction; Core Strengthening.

Background

LBP is common condition which causes pain and restricts the movement of the individual. Chronic LBP refers to a pain which is persistent beyond 12 weeks and affects the individual in terms of working and quality of life. There are high chances that farmers might have chronic mechanical LBP due to continuous movements, lifting, maintaining and remaining in bent position which is involved in farming activities. The cause of lumbar pain and restricted mobility can be due to Mechanical factors. McKenzie method or Mechanical Diagnosis and Therapy (MDT) is usually practiced in case of mechanical disorders of the spine. The McKenzie extension exercises refer to lying face down, doing the exercise face down on elbows and repeating lumbar extensions. The exercises can assist in reducing pain and increasing the lumbar mobility in the right kind of individuals. The current case report involves a 45 years old male farmer who has been suffering from chronic mechanical LBP for over 8 months. The aim in the present study is to investigate the effects of McKenzie extension

exercises on pain, lumbar mobility and functional capacity. The results are compared before and after the procedure of exercise treatment.

Prevalence

Low back pain is believed to be one of the most frequent musculoskeletal disorders in adults globally.

Low back pain is generally observed in individuals whose occupations involve physical labor.

Farmers have low back pain since the job of the farmers involves bending forward, lifting, carrying, and standing up.

The recent bends in the forward direction and lifting of the agricultural equipment and products exert immense pressure on low back vertebrae.

Age is another factor which makes the probability of having low back pain high, especially among working adults.

The occurrence of chronic low back pain causes difficulty in the functioning of an individual in his or her daily activities. Therefore, the farmers are not able to carry out their tasks. Chronic low back pain can affect the movement of lumbar spine. Exercise therapy is helpful in chronic low back pain. One of such exercises is known as McKenzie Extension Exercises.

Anatomy & Physiology

The lumbar spine is comprised of five vertebrae called L1 to L5. Also, it is known as the lower back.

The main function of the lumbar part of the spine is the support of body weight and transmission of loads from the chest to the pelvis.

The discs present between the vertebral bodies play a role in the absorption of loads.

The types of movements that can be performed using the lumbar spine are extension, flexion, lateral flexion, and some rotation of the spine.

There are various muscles that serve the stabilization of the lumbar spine, namely, erector spinae, multifidus, and quadratus lumborum.

In addition to these muscles, there are other muscles such as abdominal muscles and some muscles of the hips that stabilize movements related to the lumbar spine area.

The lumbar spine passive stability is provided by ligaments and facet joints.

Some movement is required for performing daily activities, such as walking, bending, and carrying.

However, overloading and stress cause back pain.

Epidemiology

Low back pain is one of the commonest health conditions experienced by adults.

This condition occurs amongst individuals of all age groups and occupations.

The physically active individuals suffer from mechanical causes of low back pain.

For example, farmers constantly bend, lifting and carrying loads for a long period during their daily activities.

The farmers perform their tasks in uneven surroundings where there are incorrect postures.

These factors can be aggravated due to age and occupational environment.

Some other risk factors for the development of low back pain are poor posture, muscle weakness, and chronic forms of low back pain.

The chronic low back pain not only hinders the performance of the person at work but also in his/her personal life.

In this case study, the patient is a 45-year-old male farmer suffering from chronic mechanical low back pain.

Physiotherapy Intervention

Physiotherapy is a key aspect of the treatment of chronic lower back pain without surgery.

The treatment could consist of exercising, postural correction, educating the patient and changing his lifestyle.

In this specific case, McKenzie extension exercises have been used for physiotherapy treatment.

McKenzie treatment consists of repeating certain movements and holding certain postures for treating mechanical problems of the spine.

An exercise routine can be consisting of lying on the belly, lying on the belly with bent elbows and repeated back extension.

The patient can be asked to perform certain exercises by means of press-ups and standing back extensions depending on the level of his endurance.

Patient must be careful while performing the exercises and shouldn't try to force certain movements which are painful for him.

The patient should be educated on proper postural position and loading technique that will help reduce the load on the lower back while working on the farm.

In addition, patient is recommended to perform his own exercise routine at home.

Effectiveness of the treatment can be evaluated based on comparison of pain levels and flexibility of the lower back before and after the treatment.

Aim

Objective To find out the effect of McKenzie Extension Exercise on pain and lumbar spine mobility in a 45-year-old farmer suffering from chronic low back pain.

Objectives

1. In order to measure the extent of low back pain the patient is experiencing prior to undergoing the physiotherapy program.
2. In order to measure the lumbar mobility before undertaking the McKenzie Extension Exercise program.
3. In order to ascertain the influence of McKenzie Extension Exercises on pain severity.
4. In order to ascertain the influence of the therapy on lumbar spinal mobility.
5. In order to compare the pre-intervention and post-intervention pain scores.
6. In order to compare the pre-intervention and post-intervention lumbar mobility measurements.
7. In order to measure any improvements in the functional tasks related to farming.
8. In order to inform the patient about posture and lifting techniques.
9. In order to ensure that the home exercise program is regularly performed.

Case Description

The 42-year-old male farmer suffered from chronic low back pain lasting about 8 months. The character of his disorder can be described as a muscular pain in the lumbar region of the back which appears when bending, lifting and keeping flexed position. During the patient examination, the patient mentioned that when he was performing some of his agricultural works for a couple of hours, the pain became more severe and it was difficult for him to straighten up after a prolonged bending position. The patient did not mention any recent traumas, problems with bowel or bladder and disorders of his nervous system. On physical examination, there were limitations in the lumbar flexion which provoked pain. In case of performing lumbar extension, the pain gradually disappeared. It was also found out that the patient had weak trunk muscles with poor endurance.

Intervention

Short-Term Goals

1. Alleviate the patient's low back pain and concentrate their symptoms in the first few weeks of therapy.
2. Increase lumbar extension flexibility and alleviate restrictions in functional activities.
3. Enable the patient to keep their neutral lumbar spine position while performing everyday tasks.
4. Decrease pain and discomfort in connection with long periods of sitting, standing, and bending.
5. Enhance activation and endurance of core and lumbar stabilization muscles.
6. Instruct the patient on proper lifting techniques and avoid prolonged flexion positions.

Long-Term Goals

1. There must be an important decrease in pain and disability in performing daily activities.
2. Functional mobility of the lumbar spine for work and domestic activities must be restored.
3. There should be an improvement of strength and endurance of the muscles supporting lumbar spine.
4. The patient should be able to do his work in agriculture without discomfort.
5. There should be reduction in recurrence frequency through changes in postures and actions.
6. The individual must be supported in performing the home exercise program by himself..

REHABILITATION PROTOCOL

Phase I – Pain Relief and Symptom Control

Duration: Week 1–2

- Patient education on posture, activity changes, and prevention of continuous lumbar flexion.
- Positioning in the prone position for about 2–3 minutes, based on patient tolerance.
- Positioning on elbows in the prone position to facilitate lumbar extension.
- Repetition of prone press-ups in a pain-free or symptom centralization range.
- Gentle walking to maintain activity and not remain in bed.
- Diaphragmatic breathing and relaxation exercises as needed.

Phase II – Mobility and Early Strengthening

Duration: Week 3–4

- Progression included repetition of lumbar extension exercises based on symptoms.
- Standing lumbar extension exercises may be performed at work or after prolonged bending positions.
- Include exercises for pelvic control and mild abdominal bracing exercises.
- Bridging exercises can be started for improved gluteal and core muscle recruitment.

- Gentle hip mobilization and hamstring stretching can be introduced if necessary.
- Progress the duration of walking.

Phase III – Strengthening and Functional Training

Duration: Week 5–6

- Proceed with progressive stabilization exercises using more repetitions and more resistance.
- Practice bridging progressions and trunk stabilization exercises.
- Implement body weight squats and functional lifting.
- Practice appropriate lifting and bending techniques using movements of the hips and knees and not too much flexion of the lumbar spine.
- Tolerance to sustained standing and walking needs to be improved gradually.
- Continue McKenzie extension exercises in your home programme.

Phase IV – Return to Occupational Activity

Duration: Week 7–8

- Make progress in exercises according to job demands.
- Engage in practice of farming activities with good body mechanics.
- Increase the time of activities in the field but watch for symptoms.
- Keep lumbar extension exercises when there is a period of flexion or bending.
- Develop an independent exercise regimen at home.
- Train the patient in recognizing and managing recurrence of symptoms.

Outcome Measures

The evaluation of the effectiveness of the physiotherapy intervention was carried out by means of comparing the patient's condition prior to the intervention and post-intervention. The level of pain was established by way of Numeric Pain Rating Scale (NPRS), whereas the degree of functional impairment was evaluated by Oswestry Disability Index (ODI). The lumbar flexibility was measured by the Modified Schober Test and lumbar ROM test. The strength of trunk and hip muscles was assessed via Manual Muscle Testing, and the improvements in function were established with the help of Patient-Specific Functional Scale (PSFS). The measurements were conducted before starting the rehabilitation intervention and after 8 weeks of its implementation.

Result

Outcome Measure	Pre-Rehabilitation	Post-Rehabilitation	Result
NPRS – Pain Intensity	7/10	2/10	Marked reduction in pain
Oswestry Disability Index	42%	18%	Reduced functional disability
Modified Schober Test	3.0 cm	4.5 cm	Improved lumbar mobility
Lumbar Extension ROM	15°	25°	Improved extension mobility
Trunk Muscle Strength	3+/5	4+/5	Improved muscle strength
PSFS – Functional Activity	4/10	8/10	Improved functional performance

Overall, the patient showed a marked improvement after completing the rehabilitation program. The pain level changed from the initial level of 7/10 to 2/10, indicating a significant improvement. The ODI score changed from 42% to the final score of 18%, which suggests that the overall disability level was decreased. Additionally, the lumbar flexibility and back muscles' strength have increased as well, allowing the patient to perform bending, lifting and walking activities easily.

Discussion

In this instance, a farmer's longstanding low back discomfort was successfully managed with a McKenzie lumbar extension exercise program. The patient was experiencing discomfort and incapacity as a result of lifting, bending, and work-related activities. In this instance, lumbar extension exercises, posture correction, strengthening exercises, and functional training were all part of the intervention. As part of the rehabilitation program, the patient's lumbar spine mobility improved and their level of pain gradually decreased. The patient's functional abilities were enhanced and spinal stability was supported by an increase in hip and trunk muscle strength. functional performance. Based on the results obtained, it is possible to state that patients with mechanical chronic low back pain may benefit from performing extension exercises along with strengthening exercises and functional rehabilitation. However, individual reaction to treatment varies. Additionally, due to the physical demands of the job, patient education regarding avoiding prolonged bent posture and good lifting technique was crucial. The patient was able to resume his professional activities thanks to the exercises' progressive progression. Additionally, consistent adherence to the at-home exercise regimen improved the patient's

Limitations

1. Only one patient was involved in the study, which makes it difficult to generalize the results regarding other patients with chronic low back pain.
2. There is not enough data available on possible long-term effects of the process due to such a short rehabilitation period.
3. The effectiveness of the treatment may have been impacted by the patient's compliance with the prescribed home exercise program.
4. The labour intensive occupation of the patient such as heavy lifting may also influence the outcome of the process.

Conclusion

In the current case, it has been established that a structured physiotherapy regimen is effective for managing chronic low back pain in a farmer. The McKenzie-based extension exercise program was effective in decreasing pain and increasing lumbar spine mobility and function. Strengthening exercises were useful for enhancing strength and endurance of the trunk and hip muscles. Posture correction and lifting techniques were helpful for dealing with the physical demands of farming activities. Gradual increase in the difficulty level of exercises helped in returning to normal activities. Improvement in pain, disability, mobility, and functional capacity was evident through the chosen outcome measures. Educating the patient was important for facilitating patient's active involvement in treatment. Adherence to the prescribed home exercise regimen played a vital role in treatment. The current case showed that a combination of therapeutic exercises, posture correction, and functional training provides an integrated approach to rehabilitation. Thus, McKenzie-based extension exercises along with strengthening exercises and activity modification should be regarded as an effective rehabilitation strategy for mechanical chronic low back pain.

Reference

1. McKenzie, R. A., & May, S. (2003). The Lumbar Spine: Mechanical Diagnosis and Therapy. Spinal Publications, New Zealand. This source forms the theoretical foundation for the McKenzie method and repeated movement exercises in the lumbar spine treatment.
2. Delitto, A., George, S. Z., Van Dillen, L. R., et al. (2012). Low back pain. Journal of Orthopaedic & Sports Physical Therapy, 42(4), A1–A57. This clinical practice guideline presents evidence-based physiotherapy interventions and exercise therapy of low back pain.
3. Fairbank, J. C. T., & Pynsent, P. B. (2000). The Oswestry Disability Index. Spine, 25(22), 2940–2952. This study covers Oswestry Disability Index, which is widely used to assess the degree of disability in low back pain cases.
4. Macedo, L. G., Maher, C. G., Latimer, J., & McAuley, J. H. (2009). Motor control exercise for persistent, nonspecific low back pain: A systematic review. Physical Therapy, 89(1), 9–25. This review supports motor control exercises as one of the most effective tools in persistent low back pain rehabilitation.
5. Werneke, M., & Hart, D. L. (2001). Discriminant validity and relative responsiveness of the Numeric Pain Rating Scale and the Visual Analog Scale in patients with chronic low back pain. Spine, 26(1), 15–20. This source supports the use of pain rating scales to assess the progress in chronic low back pain rehabilitation.
6. Maher, C., Underwood, M., & Buchbinder, R. (2017). Non-specific low back pain. The Lancet, 389(10070), 736–747. This article offers an overview of chronic and non-specific low back pain and its rehabilitation.
7. Hayden, J. A., Ellis, J., Ogilvie, R., Malmivaara, A., & van Tulder, M. W. (2021). Exercise therapy for chronic low back pain. Cochrane Database of Systematic Reviews, 9, CD009790. This systematic review focuses on exercise therapy of chronic low back pain.