A CONTROL TRIAL STUDY IN THE OUTPATIENT DEPARTMENT OF A PACIFIC MEDICAL COLLEGE COMPARES THE EFFICACY OF THE MCKENZIE EXTENSION EXERCISE AND THE CORE STRENGTHENING EXERCISE ON PATIENTS WITH PIVD IN THE LUMBAR SPINE

Dr Somil Chaturvedi[1*], Dr Jafar Khan[2], Dr Renuka Pal[3]

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Abstract

Background: The term prolapsed disc means the protrusion or extrusion of the nucleus. One of the main causes of low back pain is degenerative disc disease in the lumbar spine. The protrusion or extrusion of the nucleus is referred to as a prolapsed disc. It is a series of changes in the disc, not a single event, that eventually cause it to prolapse. It is a spinal disorder that can result in lower back discomfort, as well as numbness, muscle tightness, pins and needles, and a sense of muscle weakening.
Objective: The study aims to assess the effect of core strengthening exercise versus McKenzie exercise in patients with PIVD (lumbar spine) through VAS score.
Methods: This Experimental comparative study was carried out after the approval of Pacific Medical University, Institute's ethical approval obtained dated 06/09/2022, PMU/ PMCH/IEC/2022/228. All participants completed information and consent form at recruitment. 30 subjects were selected according to inclusion and exclusion criteria and divided into 2 groups of 15 subject each randomly. The Group A subject received McKenzie extension exercise and the group B subject received Core strengthening exercise. Both the group were treated for 6 weeks. For six weeks, both groups received treatment five times each week. On the first day of every week until the conclusion of the six weeks, patients were assessed using the VAS score.
Results: According to this study, patients with prolapsed intervertebral discs (Lumbar spine condition) respond better to core strengthening exercise than McKenzie extension exercise in terms of pain relief, muscle strength, and functional performance.
Conclusion: The present study's statistical analysis revealed that the core strengthening exercise regimen was extremely successful in treating low back pain associated with prolapsed intervertebral discs (Lumbar spine) condition. It is effective in reducing pain and functional impairment as a therapy strategy.

Keywords: Visual Analogue Scale, Prolapsed Inter vertebral Disc, Lumbar spine

[1]MPTh Scholar, Pacific College of Physiotherapy, Pacific Medical University, Udaipur, Rajasthan, India
[2]Dean & HOD Pacific College of Physiotherapy, Pacific Medical University, Udaipur Rajasthan India
[3]Associate Professor, Pacific College of Physiotherapy, Pacific Medical University Udaipur Rajasthan India

***Corresponding Author**
Somil Chaturvedi, MPTh Scholar, Pacific College of Physiotherapy, Pacific Medical University, Udaipur, Rajasthan, India
Email: somil.chaturvedi97@gmail.com

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1. Introduction

The major joint in the vertebral column between two adjacent vertebrae is called the intervertebral disc. An inner gelatinous nucleus pulposus, an outer annulus fibroses that encircles the nucleus pulposus, and two cartilage endplates that cover the upper and lower sides of the vertebral body make up each disc's three distinct structural components.[1]

The vertebral bodies are connected by the intervertebral discs, which are located between them. They serve as the primary covering for the nucleus pulposus, a more gelatinous core that is wedged between inferior and superior cartilage endplates.[2]

The protrusion or extrusion of the nucleus is referred to as a prolapsed disc. It is a series of changes in the disc, not a single event, that eventually cause it to prolapse. It is a spinal disorder that can produce lower back discomfort, numbness, muscle tightness, pins and needles, and a sense of weakening in the lower body's muscles. This condition, which is also known as a herniated or ruptured disc, is typically brought on by natural degradation associated with ageing.[3]

One of the main causes of low back pain is degenerative disc disease in the lumbar spine. In actuality, the degree of degenerative disc alterations actually raises the likelihood of experiencing low back discomfort.[4]

The ability to regulate the position and motion of the trunk over the pelvis to enable the best possible production, transfer, and control of force and motion is referred to as "core stability."

One of the most popular trends in rehabilitation is core strengthening. The phrase has been applied to motor control exercises, lumbar stabilization, and other regimens. In essence, core strengthening refers to the muscle control necessary to maintain functional stability around the lumbar spine.[5]

The loss of proteoglycan, which lowers the osmotic pressure in the disc matrix and reduces hydration, is the most important biochemical alteration that happens during disc degeneration.[2]

The facet joint is a key component in stabilizing the posterior parts of the lumbar spine. This is a crucial consideration in all stability evaluations.

2. Methodology And Procedure

After the approval of Pacific Medical University, Institute's ethical approval obtained dated 06/09/2022, PMU/ PMCH/IEC/2022/228. All participants completed information and consent form at recruitment.

The 30 individuals in the study range in age from 20 to 50. The Pacific College of Physiotherapy's outpatient department was where this study was carried out. A licenced specialist identified the subjects' lumbar spine conditions as pivd. After then, subjects were chosen based on inclusion criteria.

All of the patients were informed of the study's goal prior to enrolment. Each of them signed a formal consent form. They were divided into two groups of 15 each at random.

Group A - McKenzie exercise

Group B - core strengthening

Mckenzie exercise

Mechanical Diagnosis and Therapy (MDT), another name for the McKenzie approach. The McKenzie approach is well recognized as a successful back pain treatment plan. It emphasizes self-care through posture correction and frequent, high-intensity repetitions of exercise movements at the end of their range.

All the patients in this group received precautions. Patients were advised not to actively try to suppress their pain. The exercises were described to the patients. The same five exercises have been chosen

for all 15 patients.

1. Prone Lying
2. Prone on Elbows
3. Press-ups while prone
4. Prone on Arm/Leg Raises
5. Standing Extension

Core strengthening

All the patients in this group received warnings and were told not to actively try to suppress their discomfort. Total 6 exercise has been selected which is same for all 15 patients. The patients were explained about the exercises.

The transverse abdominous, multifidus, diaphragm, and pelvic floor muscles are only a few of the muscular groups that make up the "core". Together, these muscles help the lumbar (lower back) and abdominal regions to be as stable as possible.

1. Cat & Camel exercise
2. Bridging exercise
3. The Wall Squat
4. Supine Twist
5. Isometric of back
6. Pelvic tilt

3. Statistical Analysis and Results

To evaluate the effectiveness of the two treatment methods taken into consideration in this study, changes within and between groups were evaluated. A reduction in the visual analogue scale score was used to quantify pain alleviation. Using the VAS score as indicated in Table Statistics, the McKenzie Extension Exercise was employed to alleviate lower back pain caused by PIVD lumbar spine problems in group A patients. Table Information demonstrated using a single variable—the VAS score—the effectiveness of group B patients' treatment of their PIVD lumbar spine condition's low back pain with core strengthening exercises.

The student t test was used to compare the results from the two groups, McKenzie Extension Exercise and Core Strengthen Exercises. The subject conditions were comparable between the groups with regard to all selected criteria. The McKenzie extension exercise and the Core strengthening exercise demonstrated a significant difference on the V.A.S. scale. Thus, it is found that exercises for the core are more beneficial than activities for the McKenzie flexion.

GROUP	T/T	N	MIN	MAX	SUM	MEAN	Std. deviation	Std. error
Group A	VAS pre	15	7	9	123	8.2	0.862	0.223
	VAS post	15	1	4	36	2.4	0.828	0.214
Group B	VAS pre	15	6	9	122	8.13	0.915	0.236
	VAS post	15	0	3	26	1.73	0.799	0.206

Table 1: Statistics demonstrating the efficiency of both the groups of VAS pre- and post-score

Table 2: 't' Test Comparison of both the groups

GROUP	MEAN	Std. Deviation	Std. Error	95% confidence interval of the difference		t	DF	Sig. (2 – tailed)
				Lower	Upper			
Group A VAS pre/ post	5.800	0.862	0.223	5.323	6.277	26.063	14	0.000
Group B VAS pre/ post	6.400	0.910	0.235	5.896	6.904	27.231	14	0.000

4. Discussion

There was a total of 30 participants in this study, with both males and females in groups A and B. The six-week procedure was followed. The effectiveness of the McKenzie extension exercise in group A and the core strengthening exercise in group B were compared using V.A.S. Results were noted both during and after treatment. Functional impairment and low back pain were the two issues that all of the people shared. For those with low back discomfort, this treatment has been shown to have a substantial impact. Group A's VAS pre and post mean values were 8.2 and 2.4, respectively, according to an analysis of the mean VAS values (Table). The results of statistical analysis group B show that the pre- and post-intervention mean VAS values are 8.13 and 1.73, respectively. A special passive stability that would limit disc movement and diminish instability may be increased by strengthening the muscles in the core. As a result, we can draw the conclusion that core strengthening reduces pain. Relief from pain provides opportunities to exercise more, which reduces overall impairment. Core stability is more beneficial for easing pain and maybe improving physical activity. "We found that both groups' findings were statistically significant (Tables) when we compared the t test of the Effectiveness of Core Strengthening Exercises and McKenzie Extension Exercise on Low Back Pain of Lumber Prolapsed Disc Condition. Additionally, the findings revealed that both groups' pain levels had decreased, which is a sign of a decline in functional impairment. The mean and average values of the VAS pre and post in Group A are 5.800 and 26.063, respectively.

Mean and t values for the VAS pre and post in Group B are 6.400 and 27.231 respectively.

The core group b's significantly (P 0.0001) bigger gain in pain-free movement reduced the functional impairment. As a prophylactic approach, core strengthening increases stability and strength, which reduces the likelihood of disc displacement. Repeated disc displacement is a result of decreased core strength. The McKenzie exercise helped move the disc to the other side of the derangement, reducing disc prolapse, and the core stabilization exercise built up the supporting muscles, proving the effectiveness of both techniques in terms of post-treatment results. Back pain is

intimately tied to intervertebral disc degeneration. Intervertebral disc degeneration is closely related to back discomfort. "One of the main causes of low back pain is degenerative disc disease in the lumbar spine. In actuality, the degree of degenerative disc alterations actually raises the likelihood of experiencing low back discomfort".[6] Over other therapies, core strengthening therapy enhances patients' ability to return to work. The results of this pilot study showed that the Core strengthening protocol of treatment for low back pain was considerably more effective in reducing pain, extending the amount of time that can be spent comfortably sitting, and expanding the range of motion that is pain-free[7]. The McKenzie approach's impact on pain and functional disability shown a post-treatment, significantly decreased level of pain (p 0.0001) and functional disability (p 0.0001).[8]

5. Conclusion And Clinical Implication

The study can be applied to patients suffering from prolapsed intervertebral disc condition**.** In group B patients, there has been a good improvement on the VAS scale. "The results of the current study shown that a core strengthening exercise programme was very beneficial in treating low back pain caused by a prolapsed lumbar intervertebral disc condition." It is effective in reducing pain and functional impairment as a therapy strategy. In this case, my results significantly show that core strengthening exercise is more effective than McKenzie extension exercise in treating pain and improving functional disability. Core strengthening exercise helps strengthen the surrounding muscles by shifting the disc to the opposite side of the derangement, which reduces disc prolapse.

Scope & Limitation

The research to be carried out by taking large sample size. Further studies can be done by using different outcome measures. Studies with longer duration are recommended with longer follow-up period to assess the benefits. Further studies can also be done by using different variable.

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