TO STUDY THE EFFECTIVENESS OF CORE STRENGTHENING EXERCISES & MACKENZIE EXERCISES ON PAIN & FUNCTION IN CASE OF LUMBAR DISC PROLAPSE

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ABSTRACT

OBJECTIVE: To compare the effectiveness of core strengthening exercises and Mackenzie exercises on pain and function in lumbar disc prolapse condition.

METHOD: Total 60 patients were selected & divided into two groups: Group-A (N=30) & Group-B (N=30). Group-A patients were received Mackenzie exercises & Group-B patients were received core strengthening exercises. All patients were given three treatment sessions per week for six weeks. Pain & functions were measured using visual analogue scale (VAS) & modified oswestry low back pain disability questionnaire.

RESULT: The result of this study shows that Mackenzie exercises (group A) are more significant in reducing pain and improving functional activities than core strengthening exercises (group B).

CONCLUSION: Mackenzie exercises are more clinically effective in reducing pain & improving functional activities than core strengthening exercises.

INTRODUCTION

The term prolapsed disc means the protrusion or extrusion of nucleus. It is not a one time phenomenon rather it is a sequence of change in the disc which ultimately leads to its prolapsed. It is a spinal condition that can cause lower back pain, as well as numbness tightness of muscle pins and needle sensation and feeling of muscle weakness in the lower body[1].

The intervertibral disc is the main joint between two consecutive vertebrae in the vertebral column. Each disc consist of three different structures; an inner gelatinous nucleus pulposus, an outer annulus fibroses that surrounds the nucleus pulposus and two cartilage endplates that cover the upper and lower surface of vertebral body[2]. The intervertibral disc lies between the vertebral bodies, linking them together they are the main surrounds a more gelatinous core known as the nucleus pulposus; the nucleus pulposus is sandwitched inferiorly and superiorly by cartilage endplates[3].

PIVD is a collective term describing a process in which the rupture of annulus fibres allow for a displacement of nucleus pulposes within the intervertibral space most commonly in posterior or postero-lateral direction[4]. The sequence of changes occurring in PIVD are stage of nucleus degeneration stage of nuclear displacement [stage of protrusion, extrusion, sequestration] and stage of fibroses[5] degeneration of lumbar intervertibral disc is major factor associated with lumbar disc prolapsed condition in fact the risk of developing low back pain increases with the severity of degenerative disc changes[6].

The intervertebral disc of lumbar spine are not much supported by the posterior longitudinal ligament this is also one of the reason of lumbar disc herniation there is a failure of posterior annulus fibres which has the limited support with the posterior longitudinal ligament where it can allow nucleus pulposes to be herniated in postero-lateral direction .[8] The clinical condition of PIVD is develops in four stages- buldging, protrusion extrusion and sequestration[8]

Buldging: Is the early stage in which disc is stretched and does not completely returns to its normal shape when pressure is relieved.

Protrusion: Is the stage where the buldge is very prominent and the soft jelly Centre has slipped out to the inner edge of outer fibres.

Extrusion: Is the stage where the disc comes out into the canal and impinges on the adjacent nerve root.

Sequestration: Is the stage where the nucleus material has separated from the disc itself and potentially migrates[9].

METHODOLOGY

SAMPLE: Total 60 individuals were selected from University of health sciences CSJM University Kanpur and from Lifetron hospital Awas vikas Kanpur. Participants were selected according to inclusion and exclusion criteria.

MATERIAL REQUIRED

Data was collected with the help of different tools and methods, the tools were used for data collection in the study are Visual Analogue scale (VAS) and Modified Oswestry low back pain Disability Questionnaire.

INCLUSION CRITERIA

- Age 25 -50 years.

- Gender both male and females.
- Patient with radiating pain.
- Positive SLR Test.
- Patients having Chronic low back pain From 6 months as chief complaint.
- Radicular low backache radiating to one or both lower limbs. Special tests like straight leg raising test (SLRT), lasegue test are positve.

EXCLUSION CRITERIA

- History of trauma or operative intervention for low backache
- No history of any other medical or psychological condition other than lumbar disc prolapse condition.
- Patients suffering from osteoporosis, tumor, infection, fracture, any structural deformities.
- Pregnant woman
- Cancer-patients
- Lower back pain due to infective or neoplastic aetiology

THE INTERVENTION PROGRAM

Total 60 patients were selected & divided into two groups: Group-A (N=30) & Group-B (N=30). Group-A patients were received Mackenzie exercises & Group-B patients were received core strengthening exercises. All patients were given three treatment sessions per week for six weeks. Pain & functions was measured using visual analogue scale (VAS) & modified oswestry low back pain disability questionnaire.

Robin Mackenzie proposed the methods of spinal therapy in management of subjects with lumbar disc prolapsed condition. Mackenzie exercise are passive and active exercises in beginning middle and end range of trunk in flexion, extension and combination of side bending called slide gliding. There are three mechanical syndromes described by Mackenzie with which are postural, dysfunction and derangement syndrome. Centralization occurs during the reduction of derangement. When derangement is fully reduced pain is abolished and full range, pain free movement regained[41-42].

Core strengthening exercises include;

Bridging exercises, plank – these exercises primarily works on the abdominals but also engages the arms, shoulders, hip & feet which results stability of full body.

Supine bridging on physio ball, cat & camel exercises, wall squatting exercise & supine twist exerse.

Above both exercises i.e. Mackenzie & core strengthening exercises were given to group-A & group-B for three times a week for total six weeks.

All the patients were observed for severity of pain & functional activities of daily living before and after the six weeks of treatment.

DATA ANALYSIS

All the data was collected and analyzed. The statistical software SPSS 16.0 is used for analysis of data. The descriptive statistics like mean, median, S.d and frequency distribution of data was calculated. The normality of data was tested by Shapiro Wills test. The Inter group comparison of parameters between groups was done by Student t-test for two independent groups and Intra group comparison was done by Paired t-test. The comparison of effectiveness between two groups showed by Pearson's correlation. The 95% C.I. and 5% level of significance was used for analysis of data.

*Significant $p<0.05$,

** Highly significant $p<0.01$

*** Very highly significant $p<0.001$

^{NS} not significant $p>0.05$

RESULT & DISCUSSION

Correlations Showed Comparison of the Effectiveness of Core Strengthen Exercises and McKenzie Extension Exercise. The result showed that GROUP A MCKENZIE EXERCISES has shown significant improvement on pain and functional disability. Hence null hypothesis is rejected and alternative hypothesis accepted which clearly most effective in reducing pain, and improve functional disability.

Intra group comparison of mean of VAS and DISABILITY INDEX in MCKENZIE EXERCISES group between pre and post by Paired t-test

	Paired Differences					
	Mean ±Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference	t	df	P value

			Lower	Upper			
VAS Pre – VAS Post	2.033±0.999	.182	1.660	2.407	11.143	29	0.000**
DISABILITY INDEX Pre - DISABILITY INDEX Post	6.733±2.664	.486	5.738	7.728	13.842	29	0.000**

Intra group comparison of mean of VAS and DISABILITY INDEX in STRENGTHENING EXERCISES group between pre and post by Paired t-test

	Paired Differences						
	Mean ±Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	P value
			Lower	Upper			
VAS Pre – VAS Post	1.233±0.817	.149	.928	1.538	8.266	29	0.000**
DISABILITY INDEX Pre - DISABILITY INDEX Post	2.800±1.669	.305	2.177	3.423	9.188	29	0.000**

CONCLUSION

The present study findings showed that McKenzie extension exercise protocol was very much effective than Core strengthening exercises in patients with low back pain in Prolapsed Lumbar Intervertebral disc Condition. As a treatment intervention it is efficient in relieving pain and functional disability. McKenzie extension exercise helps shifting the disc in opposite side of derangement thus reducing the disc prolapsed whereas core stabilization exercise helps strengthening the surrounding muscle thus improving the stability, here my result significantly shows more effective result in McKenzie treatment to reduce pain & improve functional disability.

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