Effectiveness of Piriformis Stretching and Intermittent Lumbar Traction along with Spinal Extension Exercises in Lumbar Disc Herniation: Comparative Study

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Abstract

Objective: To compare the effect of Piriformis Stretching and Intermittent Lumbar Traction along with Spinal Extension Exercises in Lumbar Disc Herniation.

Sample: Total 30 subjects were taken for the study.

Design: Pre-test & post-test design.

Method: 30 subjects fulfilling selection criteria participated in the study. All of them were told about the procedure of study. All their queries were answered satisfactorily, and informed consent was taken from them. Intermittent lumbar traction, piriformis stretching, and spinal extension exercises were given to the participants. In the beginning of treatment, they were given VAS, Roland- Morris Low Back Pain and Disability Questionnaire and Oswestry Low Back Pain Disability Questionnaire. They were asked to fill these questionnaires. After 1 week protocol of treatment they were again told to fill these outcome measures. The participants were selected for the inclusion and exclusion criteria of the study. The patient consent was taken to be comfortable and relaxed.

Conclusion: Study suggests that Piriformis Stretching along with Spinal Extension Exercises plays a significant role in reducing pain and disability as compared to traction along with Spinal Extension Exercises. By using Piriformis Stretching, in a short period of time, patients are able to carry out functions of daily living smoothly.

Keywords: *Pain, Disability, Lumbar disc herniation (LDH), tumor necrosis factor (TNF).*

Introduction

Herniated disc is a musculoskeletal disorder responsible for sciatica and occurs due to rupture of the annulus fibrosus, following the displacement of the central mass of the intervertebral disc into thedorsalordorso-lateraldiscspaces[1]. Lumbar disc herniations are believed to result from annular degeneration that leads to a weakening of the annulus fibrosus, leaving the disc susceptible to annular fissuring and tearing[2.] Lumbar disc resolves their symptoms without substantial medical intervention[3]. It mainly affects individual between 30 & 50 years of age[4]. Furthermore, the complete natural history oft his disorder is inadequately described, although a variety of anecdotal as well as level 4-5 evidence exists, suggesting that 90% of been estimated to be attack is 37 and in76% of cases there is prior history of low back pain within the previous ten years[5]. Lumbar disc herniation is a common condition that frequently affects the spine in young and middle age patient[6].

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Symptomatic herniation of the nucleus pulposus in the lumbar spine affects 1%-2% of the general population sometime during their lives[7]. Symptomatic herniation of the nucleus pulposus is most prevalent in men during the fourth and fifth decades of life[8]. Although the majority of disc herniations occur at the L2-L3, L4/5 or L5/S1 level[9]. The majority of spinal disc herniation cases occur in the lumbar region (95% in L4- L5 orL5-S1)[10].

Methodology: A total number of 30 subjects were included fort he study, who fulfilling inclusion and exclusion criteria volunteered to take part in the study. Subjects were recruited from Divine Physiotherapy Clinic, Vasundhara, consent statement was taken from the subjects to be apart of the study. The Demographic data of the subjects were analyzed by pre-post paired, unpaired t-test, by using SPSS14.

Inclusion Criteria: Both males and females of age group 35-45 years**,** both males and females having Lumbar disc herniation (L4-L5 level), Low back pain involving lower extremities, Sciatica.

Exclusion Criteria: Mentally challenged**,** Pregnancy**,** Children and old age people**,** Congenital pathology of lumbar spine, Surgery of lumbar spine, Infectious disease, Cervical and thoracic herniated disc

Outcome Measures: 1) Visual Analogue Scale, 0-10 grades 2) The Roland - Morris Low Back Pain and Disability, having 24 Questionnaire 3) Oswestry Low Back Pain Disability having 10 statement Questionnaire, includes, pain intensity, personal care (washing, dressing etc.), lifting, walking, sitting, standing, sleeping, sex life, social life and travelling.

Methodology

30 subjects fulfilling selection criteria participated in the study. All of them were told about the procedure of study. All their queries were answered satisfactorily, and informed consent was taken from them. Intermittent lumbar traction, piriformis stretching, and spinal extension exercises were given to the participants. In the beginning of treatment, they were given VAS, Roland-Morris Low Back Pain and Disability Questionnaire and Oswestry Low Back Pain Disability Questionnaire. They were asked to fill these questionnaires. After 1-week protocol of treatment they were again told to fill these outcome measures. Data was collected in the data collection form. All the patients were asked to perform spinal extension exercises (dog-bird,Cat- cow, Half cobra) 10 second hold and 10 repetitions once a day for one week. Intermittent lumbar traction was given to 15 subjects for 15 minutes once a day for one week, Piriformis stretching were given to another 15 subjects with 30 second hold and 4 repetitions once a day for oneweek.

Data Analysis: To analyze the effect of Piriformis Stretching and Intermittent Lumbar Traction on total 30 (15 PS and 15 ILT) subjects, post scores & post-post scores of pain were analyzed by using Mean, Standard Deviation and t-test. Paired t- test was used to find out any significant differences between pre-post test and unpaired t-test was used between post-post test of pain to assess which intervention significantly reduce the pain for assigned duration and frequency.

Comparision of Visual Analogue Scale (Piriformis Stretching) between Pre and Post Test:

Variable	Group	Treatment	N	Mean	S. D.	Standard Error Mean	D.F	t-value
Visual Analogue Scale	Pre-Test	Piriformis Stretching	15	7.26	.59	.15	14	15.19*
	Post-Test		15	2.86	1.06	.27		

*Significant at 0.01 level df = 14, At 0.01 t-value of the Table is 2.97

Comparision of Visual Analogue Scale (Intermittent Lumbar Traction) between Pre and Post Test:

Variable	Group	Treatment	N	Mean	S.D.	Standard Error Mean	DF	t-value
Visual Analogue Scale	Pre-Test	Intermittent Lumbar Traction	15	7.26	.88	.22	14	12.58*
	Post-Test		15	4.46	.91	.23		

*Significant at 0.01 level df =14, At 0.01 t-value of the Table is 2.97

Comparision of Visual Analogue Scale between Post Test (Piriformis Stretching) and Post Test (Intermittent Lumbar Traction):

Variable	Group	Treatment	N	Mean	S. D.	Standard Error Mean	D.F.	t-value
Visual Analogue Scale	Post-Test	Piriformis Stretching	15	2.86	1.06	.27	28	4.42*
	Post-Test	Intermittent Lumbar Traction	15	4.46	.91	.23		

*Significant at 0.01 level df =28, At 0.01 t-value of the Table is 2.76

Comparision of Oswestry between Post Test Piriformis Stretching) and Post Test (Intermittent Lumbartraction):

Variable	Group	Treatment	N	Mean	S. D.	Standard Error Mean	D.F	t-value
Oswestry	Post-Test	Piriformis Stretching	15	29.68	8.39	2.16	28	1.57**
	Post-Test	Intermittent Lumbar Traction	15	35.65	12.07	3.11		

** Not Significant at 0.01 level df =28, At 0.01 t-value of the Table is 2.76

Comparision of Roland Morris Back Pain and Disability (Intermittent Lumbar Traction) Pre and Posttest:

Variable	Group	Treatment	N	Mean	S. D.	Standard Error Mean	DF	t-value
Roland Morris Back Pain and Disability	Pre-Test	Intermittent Lumbar Traction	15	19.46	2.89	.74	14	16.65*
	Post-Test		15	9.60	1.29	.33		

*Significant at 0.01 level df =14, At 0.01 t-value of the Table is 2.97

Comparision of Roland Morris Back Pain and Disability between Post Test (Piriformis Stretching) and Post Test (Intermittent Lumbar Traction):

Variable	Group	Treatment	N	Mean	S. D.	Standard Error Mean	D.F	t-value
Roland Morris Back Pain and Disability	Post-Test	Piriformis Stretching	15	5.00	2.00	.51	28	7.47*
	Post-Test	Intermittent Lumbar Traction	15	9.60	1.29	.33		

*Significant at 0.01 level df =28, At 0.01 t-value of the Table is 2.76

Result

The results of this study support that Piriformis stretching will be more effective and significant in reducing pain and disability (due to LDH) than Intermittent Lumbar Traction.

Future Scope and Research: Present study was limited to 35-45 age group. Further research examining the effects of both PS and ILT on individuals in younger and older age groups would be of interest. Future research must include a follow-up of at least 15 days/16 days to check the short term/long term effects of PS and ILT.

Conclusion

Study suggests that Piriformis Stretching along with Spinal Extension Exercises plays a significant role in reducing pain and disability as compared to traction along with Spinal Extension Exercises.

Ethical Clearance: Prior Patient consent form was taken.

Source of Funding: Self

Conflict of Interest: Nil

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