

Effects of Mulligan Traction Leg Raise versus Slump Stretching on Pain and Functional Disability in Lumbar Radiculopathy

Effects of
Mulligan
Traction Leg
Raise versus
Slump Stretching

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ABSTRACT

Objective: To compare the effects of Mulligan Traction Leg Raise versus Slump Stretching on Pain and Functional Disability in Lumbar Radiculopathy.

Study Design: Quasi experimental study

Place and Duration of Study: This study was conducted at the Family Clinic Baghbanpura, Lahore from September 2020 to February 2021 for a period of six months.

Materials and Methods: Consecutive sampling technique was used to select a sample of 40 patients from Physiotherapy department of Family clinic, Lahore. Study was completed in 6 months. Patients randomly allocated into 2 groups. Group A treated with Mulligan Traction leg raise with lumbar stabilization exercises and Group B treated with Slump stretching with lumbar stabilization exercises. Patient evaluated for improvement in symptoms through numeric pain rating scale and Oswestry disability index. Each group received treatment session 3 times per week for 4 weeks. Data was analyzed by using SPSS version 21.

Results: The result cleared that Group A Mulligan traction leg raise showed significant results in pain and disability with p value less than 0.05. Group A showed decreased in pain with mean value of 1.60 ± 1.536 as compared to Group B which is 4.00 ± 1.947 . Where Group A showed improvement in disability with mean value of 16.35 ± 10.038 as compared to Group B where mean value is 45.60 ± 20.849 . Group B showed improvement but not showed significant results in comparison of group A.

Conclusion: It is concluded that Mulligan traction leg raise with lumbar stabilization exercises is much better technique to improve pain and functional disability in lumbar radiculopathy patients. Slump stretching with lumbar stabilization exercises is also very effective but results showed more significant effects of Mulligan traction leg raise.

Key Words: Disability; Muscle stretching exercises; Pain; Radiculopathy; Traction

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INTRODUCTION

Lumbar Radiculopathy is the most common experienced diagnosis in orthopedic clinical practices. Patient describes radiculopathy symptoms like electric, sharp, and burning pain that radiates from back to downward in the legs.¹⁻³

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The lower spinal region is the place from where the pain starts and is considered as Lumbar radiculopathy and sciatic pain can be associated with it. Due to lumbar radiculopathy, the area which is most affected is the lower back, buttocks region, and hamstrings. About 80% of people experience back pain at least 1 time in their life's according to the American Association of Orthopedic Surgeons.^{3,4} From the level of L1-S4, nerve roots exit the spine cause nerve root compression and produce damage.⁵ SIJ dysfunction, tightness, or spasm of piriformis lead to piriformis syndrome is also a major contributor to lumbar radiculopathy.⁶ As a result of compression, patients report radiating pain, paresthesia, tingling, occasional shooting pain, numbness, and often reports with feet or leg weakness and muscular stiffness around the spine.³ Women develop symptoms at the age of 50-60 years whereas men mostly affected and produce symptoms at the age of 40.¹ It's a vital contributor approximately having sixty to eighty percent lifetime incidence of LBP⁷ and

affecting both women and men with an estimated prevalence of 3-5% of the whole population.⁸ Interventions related to Manual therapy have always shown significant improvements in functional outcomes and in pain of low back patients receiving treatment for both non-neural and neural type painful conditions.⁹ The treatment technique used as an intervention widely for the dysfunction of low back pain is Mulligan's mobilization with movement (MWM). Mulligan Traction leg raise is a pain-free intervention that has instant benefits in patients with radiculopathy which has decreased range of hip flexion.^{10,11} The slump test is a neuro-dynamic test that is suspected to evaluate the mechano-sensitivity of the neuro-meningeal structures within the vertebral canal.¹²⁻¹⁴ In current research work, we find out the effects of Mulligan traction leg raise versus slump stretching on pain and functional disability in lumbar radiculopathy patients, to check beneficial technique in lumbar radiculopathy patients. Through the result of this study, researcher believe to contribute some knowledge regarding techniques either Mulligan traction leg raise versus slump stretching improve pain and decrease functional disability or not and which technique showed significant results.

MATERIALS AND METHODS

It was a quasi-experimental study. This study was conducted at Family Clinic Baghbanpura, Lahore, Pakistan. Study was conducted from September 2020 to february 2021. A sample size of 40 was calculated by using Open Epi, version 3. To conduct this study, Consecutive sampling technique used to collect data and on the basis of inclusion exclusion criteria 40 patients with lumbar radiculopathy were selected from the Family clinic's OPD. Informed consent was taken from the patients before starting treatment. Assessor was blinded which made this study a single blinded study. The investigator used lottery method to randomly allocate the participants into Group A (Mulligan traction leg raise) and group B (Slump stretching). All subjects with pre diagnosed lumbar radiculopathy, unilateral or bilateral radiation of pain in sciatic nerve distribution, with SLR test positive, both genders male and female, 18 to 50 years' age was the inclusion criteria for this study. Patients undergoing History of spinal surgery in previous 6 months, Knee and ankle pathology causing limitation of movement, Clinical conditions such as over sensitive skin, patient with cardiac pacemaker, pregnancy etc, Serious spinal condition e.g infection, tumors, osteoporosis, spinal fracture, Inability to hold slump stretching position, reproduction of symptoms on neck flexion part of slump test, Patients with cervicogenic headache, VBI, spinal deformities and ankylosing spondylitis was the exclusion criteria for this study. Group A Mulligan traction leg raise was allocated 20 participants and in

the other group B slump stretching also 20 participants were allocated. The data collection tools used were Numerical pain rating scale for pain and Oswestry disability index scale for low back disability.

In group A the subjects received Mulligan traction leg raise and lumbar stabilization exercises. Treatment session was given 3 times per week for 4 weeks for 20 minutes. Lumbar stabilization exercises include static glutei, static back and static hamstring hold for 10 seconds with maximum 10 repetitions. While in Group B the subjects received Slump stretching and lumbar stabilization exercises. Treatment session includes 3 times per week for 4 weeks for 20 minutes. Lumbar stabilization exercises includes static glutei, static back and static hamstring hold for 10 seconds with maximum 10 repetitions. Evaluation was done before treatment and at the end of 4th week. The data was analyzed by SPSS version 21. The quantitative variables were presented as mean and standard deviation. For checking the normality in the data shapiro-wilk test used. Before/after comparisons was done by using parametric methods as data is normally distributed. For within group comparison Paired sample t-test and for between groups comparison independent t test was applied. An alpha-level of 0.05 was selected for level of significance.

RESULTS

40 individuals were chosen for the study. The patients who fall in the inclusion criteria were 40. 40 subjects then randomly scattered into two treatment groups (Group A: Mulligan traction leg raise; Group B: Slump stretching). Both groups socio-demographic information was similar at baseline. Participants in Group A Mulligan traction leg raise were presented with mean age of 34.15 ± 9.366 years and in Group B Slump stretching with 33.95 ± 9.976 years. Participants in Group A were presented with mean height of 1.6490 ± 0.05794 meters and in Group B with 1.6685 ± 0.6327 meters. Participants in the Group A were presented with mean weight of 68.00 ± 7.377 kg and in Group B with 70.80 ± 9.823 kg. Participants in Group A were presented with mean BMI of 24.955 ± 3.7214 kg/m² and in Group B with 25.200 ± 3.3479 kg/m² as shown in Table 1.

The pre and post treatment numeric pain rating scale values between two groups was done using independent sample t test. Analysis revealed that there was statistically significant difference in both groups with p value < 0.05. Group A showed greater improvement in numeric pain rating scale value as shown in table 2. The pre and post treatment oswestry disability index values between two groups was done using independent sample t test. Analysis revealed that there was statistically significant difference in both groups with p value < 0.05. Group A showed greater improvement in oswestry disability index as shown in table 2.

Paired sample t-test was used to compare the values of numeric pain rating scale score and Oswestry disability index score within each treatment group. Results declared significant difference in both the groups but greater improvement was seen in Group A Mulligan traction leg raise.

Table No.1: Comparison with regard to Mulligan traction leg raise and Slump Stretching

Group		Mean	Std. Deviation
Mulligan traction leg raise (N=20)	Age (years)	34.15	9.366
	Height (meters)	1.6490	.05794
	Weight (Kg's)	68.00	7.377
	BMI (kg/m2)	24.955	3.7214
Slump stretching (N=20)	Age(years)	33.95	9.976
	Height(meters)	1.6685	.06327
	Weight(Kg's)	70.80	9.823
	BMI(kg/m2)	25.200	3.3479

Table No.2: Comparison with regard to Numeric pain rating scale and Oswestry disability index

Variable		Treatment group		p value
		Mulligan traction leg raise	Slumps stretching	
Numeric pain rating scale (NPRS)	Pre-treatment (Mean±SD)	6.40±1.81	6.95±1.73	0.000
	Post-treatment (Mean±SD)	1.60±1.53	4.00±1.94	
Oswestry disability index (ODI)	Pre-treatment (Mean±SD)	52.80±15.35	55.25±15.35	0.000
	Post-treatment (Mean±SD)	16.35±10.03	45.60±20.84	

DISCUSSION

The aim of this study was to compare two non-invasive treatment techniques, one was Mulligan traction leg raise and other was Slump stretching on pain reduction and functional mobility in lumbar radiculopathy patients.

In current study, there is statistically significant difference in results of numeric pain rating scale in between group analysis. Pain decreased to greater extent in post-treatment of Mulligan Traction leg raise group with mean value 1.60±1.536 as compared to Slump stretching group 4.00±1.947 of group. The results are in accordance with one study conducted in 2018 in which swati mishra found that numeric pain rating scale value decreased markedly by rehabilitating a patient with lumbar radiculopathy in Mulligan traction leg raise group. (6) Another study conducted in 2016 by Giovanni E Ferreira, showed results that numeric pain rating scale showed improved pain in post-treatment evaluation which supports the results of this study. (15)

Gustavo Plaza-Manzano conducted study in 2020 in lumbar radiculopathy patients and concluded that reduction in mechanical sensitivity is seen but not seen a greater change in pain or pressure pain threshold by using NPRS. (16) The decrease in pain in Group A is more due to the fact that Mulligan traction leg raise is more directed to specific functional movements of lumbar spine and so targets the joint restrictions. The improved blood circulation can further decrease the pain level. Group B also showed improvement but to limited extent as it includes general exercises that targets the general mobility and muscular strength.

The results of study showed that there was statistically significant difference between Post-treatment oswestry disability index score values of two groups. Group A showed greater improvement on oswestry disability index with mean value of 16.35±10.038 as compared to Group B with mean value of 45.60±20.849. These results were supported by another RCT done by Jaida NK, all in which they found that ODI measurements indicate that functionality improved after the last session and showed that technique was effective. (17)

Another RCT study administered by karthika and rajalaxmi and outcome measures showed significant results that disability is improved at the end session supports our study results. (18) Ali, Rehman, Ahmed also conducted RCT study in Pakistan and ODI scale showed significant results by decreasing disability using these techniques in chronic low back patients. (19) Giovanni E Ferreira, in RCT study showed that outcomes measures of disability by using ODI not showed significant results, function is improved in the end session but no improvement seen is disability. (19)

Traction leg raise elongate muscle and hold this position provide greatest tolerated length so improve pain of restricted leg and elongation improve range and reduce disability. It mobilizes the nerve as well as stretch the muscle so symptom's relief and functional ability improves because traction not provoke symptoms. Also in two studies conducted by C. berlin and Larsson and pal showed significant improvement in pain and disability and strongly encouraged the mulligan traction leg raise. (20,21,6)

CONCLUSION

It is concluded that Group A Mulligan traction leg raise with lumbar stabilization exercises is much better technique to improve pain and function disability in lumbar radiculopathy patients. Group B Slump stretching with lumbar stabilization exercises is also very effective but results showed significant effects of Mulligan traction leg raise.

Author's Contribution:

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