

“A Comparative Study to Evaluate the Effectiveness of Mulligan’s BLR Versus Traction SLR Technique in Non-Specific Low Back Pain”

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ABSTRACT

Objective : *The purpose of this study was to compare the effectiveness of Mulligan’s bent leg raise technique with traction SLR technique on acute non-specific low back pain.*

Method: *60 subjects were included in the study with age group ranging from 40 -60 yrs. These subjects were divided into two groups with 30 each; Group A received Mulligan’s bent leg raise technique and Group B received traction SLR technique. Treatment session was conducted for 4 weeks with 3 sessions per week. Outcome measures, Pain and functional disability was measured using Modified Oswestry Disability Scale (MODS) and Active knee extension Range of motion was measured by standard Goniometer .Assessment was done pre and post intervention at the end of 4th week.*

Results: *Means were analyzed using Independent ‘t’ test and Mann Whitney test, results showed that there was statistically significant improvement found in means of Outcome measures. The findings of the study suggest that both the interventions were effective in reducing pain and improving ROM.*

Conclusion: *The present study concludes that both the techniques, Mulligan’s bent leg raise technique and Traction SLR techniques were found statistically significant in reducing pain, improving ROM and decreasing the level of disability. Therefore, both the techniques are proved to be effective in treating low back pain.*

INTRODUCTION

low back pain refers to pain in the lumbo-sacral region of spine from 1st lumbar vertebra to the 1st sacral vertebra. This is the area of the spine where the lordotic curve forms.¹ Low back pain (LBP) is a worldwide problem with prevalence rate high as 84% by World Health Organization (WHO).² It occurs in similar proportions in all races, with different quality of life and work performance, and is the most common reason for medical consultations. These days rate of Occurrence of LBA in India is increasing drastically which has reported to be 23.09%.³ Half of the population will experience a significant incident of low back pain by the age of 30 years.⁴ Low back pain (LBP) is defined as —pain and discomfort, localized below the costal margin and above the inferior gluteal folds, with or without leg pain. LBP is a common cause of disability creating a large social and economic burden on society. However most of the people suffering from LBP recover quickly from its episode, disability resulting from back pain is the most common cause of limitation of activity in adults aged <45 years.

Non-specific low back pain is defined as low back pain not attributable to a recognizable, known specific pathology (e.g., infection, tumor, osteoporosis, fracture, structural deformity, inflammatory disorder, radicular syndrome.)⁵ Based on the duration Non-Specific LBP (NS-LBP) is classified Acute (Less than 6 weeks), Subacute (6 weeks – 3 Months) and Chronic (More than 3 Months).⁶

flexibility of the Hamstrings provides functional mechanical advantage, while tight or shortened hamstring muscles affects spinal mechanics adversely. Loss of hamstring flexibility may be caused due to lack of pelvic mobility, which leads to muscle impairment and decreases strength of core muscles which limits pelvic mobility and increases strain on the lumbar spine. In addition, tight hamstrings by reducing core muscles strength reduces the lordotic curve, which may alter spinal loading and alteration in the Lumbar Pelvic Rhythm will generate strain on the lumbar segment giving rise to LBP. Several Studies on Mulligan's techniques have proved to be efficient in improving Hamstrings flexibility. Mulligan's Bent Leg Raise Technique (BLR) is a new technique that has been developed by Dr. Brian R Mulligan which is considered to be a painless technique, and can be tried in any patients with hamstrings tightness, low back pain and who has limited and/or painful straight leg raise (SLR). There is a paucity of studies published in the peer reviewed literature that have compared the efficacies of Mulligan's techniques in Hamstrings flexibility.

So the Present study intended to compare the effectiveness of Mulligan's Bent Leg Raise technique & traction SLR in subjects with Acute Non-specific LBP having restricted range of SLR and to determine whether a difference of treatment efficacy exists among the two mulligan's Techniques

METHODOLOGY

60 individuals were selected for the study. **INCLUSION CRITERIA :** Both male and female of age group 18 to 45 year, LBP with no specific pathology, LBP less than 6 weeks, Subjects who are able to comprehend command and willing to participate in the study. **EXCLUSION CRITERIA:** Subjects with LBP with trauma, LBP with specific pathology, Any neurological symptoms involving prolapsed intervertebral disc and radiating pain ,History of any recent Abdominal and Back Surgeries ,Pregnancy, Psychologically imbalance ,were excluded from the study.

Procedure: Subjects who fulfilled the inclusion and exclusion criteria were randomly allocated into two groups, each group consisting of 30 subjects, Group A with 30 subjects and Group B with 30 subjects. Written consent was taken from the patients prior to the starting of the intervention program. individuals selected for the study were assessed prior and post of the intervention program with outcome measures like Oswestry disability index and Active Knee Extension (AKE) range of motion. Intervention program was about 3 days a week for 4 weeks.

GROUP A underwent Mulligan's Traction SLR Technique along with Hydro collator packs and isometric exercises for 20 minutes a day for 3 days a week for 4 weeks.

To improve Hamstrings flexibility Traction SLR Technique was used which involves sustained traction applied to the limb with the knee extended. The patient is in supine lying position on low bed or on the floor and therapist stands facing the patient's affected side. Patient actively does the SLR,. Therapist now grasp patient lower leg proximal to the ankle joint and raise it off the bed to a position just short of the painful range. Therapist flexes his knees and holds the clasped leg to his (therapist's) chest. When the therapist extend his knees this will effectively apply a longitudinal traction to the leg provided. Sustain this traction and undertake a straight leg raise as far as there is no pain generated. If there is pain slightly rotate, abduct or adduct the hip while raising the leg.

GROUP B underwent Mulligan's Bent Leg Raise Technique along with Hydro collator packs and isometric exercises for 20 minutes a day for 3 days a week for 4 weeks.

Bent Leg Raise Technique: Patient positioned in Supine lying at the edge of the plinth with Hip and Knee in 90° Flexion. Therapist position: Walk Stance on the affected side.

Hand Placement: Shoulder of the inner hand is placed under the popliteal fossa. Therapist grasps the lower end of thigh with both the hands. **Mobilisation-** Longitudinal traction is applied along the long axis of the femur, Therapist takes the hip in to flexion until first resistance is felt, If patient complains of stretch pain or if therapist feels resistance due to muscle tightness, contract-relax technique is applied by asking the patient to push the therapist's shoulder gently (hold for five seconds). Now, if pain free therapist can take the patient's hip into further flexion, In case If patients complaints of pain during this maneuver, then hip can be moved into abduction or external rotation / more traction before further hip flexion is added. Hold the end position for about 20 seconds, Repeat the process three times and reassess the changes brought about by this mobilization.

Post-test evaluation was done after the end of 4 weeks of intervention on the basis of outcome measures.

RESULTS

Basic Characteristics of the subjects studied

Basic Characteristics of the subjects studied		Traction SLR Technique (Group A)	Bent Leg Raise technique (Group B)	Between the groups Significance
Number of subjects studied (n)		30	30	--
Age in years (Mean± SD)		48.67± 4.99 ()	48.87± 5.17 ()	P= 0.924 (NS)
Gender	Males	13	12	-

	Females	17	18	-
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The above table shows that in Group A there were 30 subjects with mean age 48.67 years and there were 13 males 17 females included in the study. In Group B there were 30 subjects with mean age 48.87 years and there were 12 males 18 females included in the study. There is no significant difference in mean ages between the groups.

Analysis of pain and functional disability on MODS within traction SLR group (Pre to post test analysis)

GROUP A Traction SLR

		Mean	N	Std. Deviation	t-value	df	Sig. (2-tailed)
Pair 1	MODS_Pre	30.37	30	5.840	11.209	29	.000**
	MODS_Post	13.27	30	4.571			
Pair 2	AKE_Pre	23.13	30	3.203	19.408	29	.000**
	AKE_Post	29.93	30	2.993			

In pair 1, pre MODS effect of Traction SLR (30.37 ± 5.84) elicited a statistically significant decrease as compared to Post MODS (13.27 ± 4.57); Post effect of traction SLR technique on MODS in subjects with LBP was significantly effective (t-value=11.209, df=29, p=0.00). In pair 2, pre AKE effect of Traction SLR (23.13 ± 3.20) elicited a statistically significant increase as compared to AKE Post (29.93 ± 2.99);

Hence, Post effect of traction SLR technique on AKE test to improve hamstrings flexibility in subjects with LBP was significantly effective (t-value=19.408, df=29, p=0.00).

GROUP B Bent Leg Raise

		Mean	N	Std. Deviation	t-value	df	Sig. (2-tailed)
Pair 1	MODS_Pre	29.67	30	5.604	16.578	29	.000**
	MODS_Post	11.20	30	3.899			
Pair 2	AKE_Pre	22.73	30	2.982	13.774	29	.000**
	AKE_Post	32.13	30	3.137			

In pair 1, the Bent Leg Raise group of sample, pre MODS elicited a statistically significant decrease to post MODS $t(29)=16.578$. $p=0.000$. In pair 2, the Bent Leg Raise group of sample, pre Active Knee Extension ROM elicited a statistically significant increase to post Active Knee Extension ROM $t(29)=13.774$. $p=0.000$.

Comparison of means of Analysis of pain and functional disability on MODS and Active Knee Extension ROM between TSLR group and BLR group (Pre to post test analysis)

	GRP	N	Mean	Std. Deviation	t-value	df	Sig. (2-tailed)
MOD_Pre	Traction SLR	30	30.37	5.840	.474	58	.637
	Bent Leg Raise	30	29.67	5.604			
MOD_Post	Traction SLR	30	13.27	4.571	1.884	58	.065*
	Bent Leg Raise	30	11.20	3.899			
AKE_Pre	Traction SLR	30	23.13	3.203	.501	58	.619
	Bent Leg Raise	30	22.73	2.982			
AKE_Post	Traction SLR	30	29.93	2.993	2.779	58	.007**
	Bent Leg Raise	30	32.13	3.137			

This study found Traction SLR and Bent Leg Raise MOD_Pre Patient had statistically no significant at equal level (30.37 ± 5.840) at the Bent Leg Raise (29.67 ± 5.604) ($t(58) = 0.474$, $P = .637$ (N.S.)). This study found Traction SLR and Bent Leg Raise MOD_POST Patient had statistically marginally significant reduce at (13.3 ± 4.571) at the Bent Leg Raise (11.2 ± 3.899) ($t(58) = 1.884$, $P = .065$).

The above table shows that when pre intervention means of Analysis of pain and functional disability on MODS and Active Knee Extension ROM between TSLR group and BLR group (Pre to post test analysis) were compared, there is no statistically significant difference seen between the groups (TSLR vs BLR).

DISCUSSION

In the present study it was found that both TSLR technique and BLR technique are effective in improving low back pain, active knee extension ROM and functional disability in subjects with acute non-specific low back pain. However there is no significant difference noted between both the techniques.

On comparison of both the groups, there was no statistical significant difference recorded in TSLR and BLR technique on treating low back pain and functional disability, but there is statistically significant difference in improvement of active knee extension ROM. Relief of pain was found in both the groups over treatment for 4 weeks. It is important to note that all participants were given common mode conventional treatment. Subjects above 40 years of age were prone for this condition simply because of the process of aging. The findings of this study correlated with above reference since maximum number of subjects were in the age group of 40 to 60 years. Aging causes cellular dysfunctions, which lead to discal changes. It has been reported that reduction in the disc height, causes compression and bulging with dimensional changes of the spine.^{7,8,9} In the present study reduction in pain level, as quantified by the MODS with the application of both Mulligan's traction straight leg raise and bent leg raise is consistent with the findings of previous studies indicating Mulligan's traction straight leg raise and bent leg raise techniques reduce low back pain. According to Fazio¹⁵, neural manipulation would stretch and provoke the nerve and hence not be useful in pain reduction.

However there was no significant difference found on comparing the pre and post session values between the groups, which suggests that both Mulligan's traction straight leg raise and bent leg raise techniques are effective in improving range of SLR and can be used in the treatment of low back pain. This could have been due to relief of pain, increase in extensibility of soft tissues,

increased sciatic nerve mobility, stretching of myofascial structures as well as increased lumbar mobility and decreased mechanosensitivity of neural structures.

In the present study it was found that both TSLR technique and BLR technique are effective in treating low back pain, active knee extension ROM and functional disability in subjects with acute non-specific low back pain. However there is no significant difference between both the techniques. When compared between the groups, study showed there is no statistical significant difference between TSLR technique and BLR technique in treating low back pain and functional disability, but there is statistically significant difference in improvement of active knee extension ROM.

CONCLUSION The present study concludes that the Mulligan's Traction SLR and Bent Leg Raise were found statistically and clinically significant on reducing Pain, Disability and Improving AKE Range of Motion. It was found that there is no significant difference in reducing Pain and disability when compared between both the techniques. However, Bent leg raise has shown to have greater percentage of improvement in reducing Pain, Disability and improving AKE range of motion.

It is suggested that both the stretching techniques can significantly help therapist in providing précised technique for hamstring flexibility and thus reducing the low back pain, improving functional ability and improving AKE range of motion.

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