

The Effectiveness of Mulligan Techniques to increase the Flexibility of Hamstring Muscles: A Quasi-Experimental Study.

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ABSTRACT

Background: Hamstring tightness is one of the musculoskeletal disorders emerging due to shift in life style. The current life styles leave the community with extensibility of body systems at risk of decline and deconditioning including muscular system.

Aim: To compare effect of Mulligan Bent Leg Raise Technique and Mulligans' Traction Straight Leg Raise Technique in improving the performance of hamstring muscle. It was a quasi-experimental study.

Methodology: Total 20 patients were recruited in each group based on sample of convenience. The Inclusion criteria was 20 to 45 years of age, male and female, failing to fully raise straight leg more than 60 degree were included. Exclusion criteria was subjects having hamstring tightness, but with history of recent trauma, surgery or any neuromuscular deficit. Data were collected; pre and post intervention SLR values were recorded using standard Goniometers.

Results: Results of paired sample statistics showed a mean difference and standard deviation of 8.45 ± 3.051 for bent leg raise technique while that of 9.80 ± 2.56 for traction straight leg raise technique, while significant difference as showed by p value to be 0.000. Independent samples T-test and paired samples T-test were applied to measure the outcomes. P-value less than .05 was considered significant.

Conclusion: Both of the Mulligan techniques i.e. Bent Leg Raise Technique and Traction Straight Leg Raise Technique were found equally effective.

Keywords: Bent Leg Raise (BLR), Traction Straight Leg Raise (TSLR), Physical Therapy, Hamstring Tightness, Mulligan Manual Therapy.

INTRODUCTION

The Mulligan concept is one of the popular interventions to address patients with hamstring tightness. Mulligan's techniques are frequently used in physical therapy practice. 41% of British physiotherapists use this technique to manage Low Back Pain disorders¹.

The Mulligan bent leg raise (BLR) technique is one of the means of improving range of straight leg raise (SLR) in subjects with hamstring tightness. The extent of impairment in Hamstring is reduced by using Mulligan bent leg raise (BLR) technique. The SLR test has been reported as an indicator of musculoskeletal abnormalities. Restriction in range of SLR in the affected lower limb as compared to good side is due to the insufficient elasticity of hamstrings^{2,3}. Decreased flexibility of the hamstrings can reduce the movement of lumbar spine⁴.

The BLR technique (Mulligan, 1999) is used to apply static contraction of the hamstring muscle for five seconds, three times in five different positions of hip flexion with progressively increased range⁵. Another Mulligan mobilization technique frequently being used to increase hamstring flexibility is the traction straight leg raise technique (TSLR), which is used to gain the range of the straight leg raise (SLR) in subjects with LBP⁶. The SLR movement produces posterior pelvic rotation and flexion of the lumbar spine along with hip flexion. One of the factors affecting the normal mobility of SLR may be increased

mechano-sensitivity of the lumbar neural tissues or it may be due to the pathology of somatic structures, so investigation of SLR is necessary to assess these factors⁷.

SLR test has proved to be affecting the pelvis movement, lumbosacral neural structures and hamstring muscles biomechanically. Hence, it gives importance to SLR in evaluation of the component movements that include hip flexion and posterior pelvic rotation. There was an inverse relation between SLR and sitting hours (8). Studies are available on other techniques outcome comparisons but no study is found particularly on these two techniques at national level, so this study is aimed to produce evidence of the effectiveness of BLRT and TSLR in improving flexibility of the hamstring muscle.

MATERIAL AND METHODS

Present study was conducted at Amin welfare and teaching hospital, Sialkot for 6 Months after ethical approval. Sample size was 40 divided equally into two groups, Non Probability Sampling Technique. Local moist Heat for 20 minutes was used as baseline treatment for both the groups. Group A received only Mulligan's Bent Leg Raise-BLR while Group B received Mulligan's Traction straight leg raise TSLR. SLR was used as major outcome which was recorded using standard Goniometer. Both genders with age ranging from 20-45 years failing to raise straight leg beyond 60 degree were included. Subjects having hamstring tightness with recent trauma, surgery or any neuromuscular deficit or those not willing to participate in

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the study were excluded from study. The techniques were administered twice a week for four weeks.

Data were evaluated by using SPSS version 20. The quantitative variables like age was represented using Mean ± SD. The qualitative variables like gender was represented as frequencies and percentages. Independent samples T-test and paired samples T-test were applied to measure the outcomes. P-value less than 0.05 was considered significant.

RESULTS

Parameters like age and gender distribution among both groups was summarized in table-1. Mean of improvement in SLR with both the techniques; it was 8.45+ 3.05 for BLRT and 9.8+2.56 for TSLR with significant p-value as shown in table-2.

Table-1: Gender And Age Distribution Among Both Groups

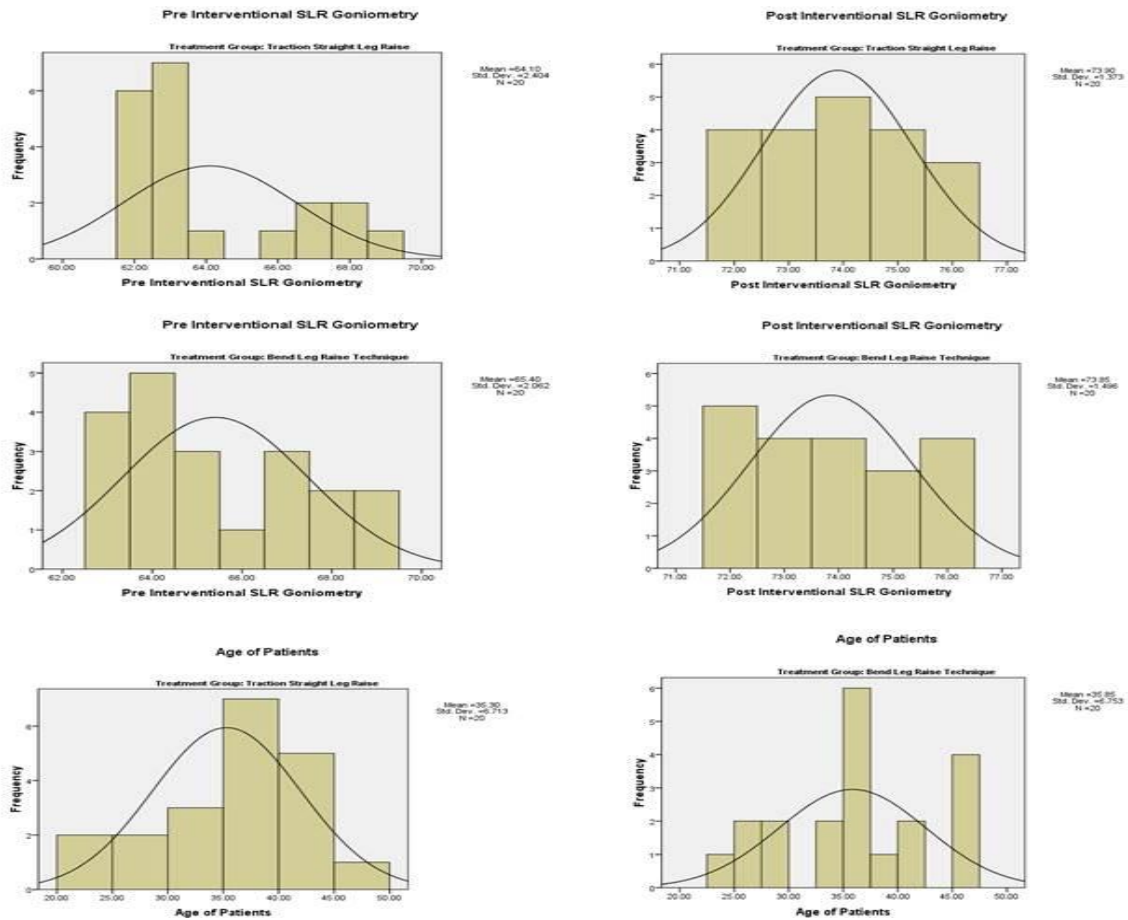
Gender	Male	Female
BLR	11 (55.0%)	9 (45.0%)
TSLR	10 (65.0%)	10 (50.0%)
Age	Mean ± SD	
BLR	35.85±6.5	
TSLR	35.30±6.71	

Table-2: Pre and Post exercise Straight Leg Raise Range among Enrolled Subjects

Pre-interventional SLR range	Mean ± SD
BLR	65.40±2.06
TSLR	64.10±2.40
Post-interventional SLR range	Mean ± SD
BLR	73.85±1.49
TSLR	73.90±1.37
Improvement In SLR range	Mean ± SD
BLR	8.45± 3.05
TSLR	9.80±2.56

P value 0.000*

Figure: 1 Results of Pre & Post interventional SLR



DISCUSSION

The current study detect the mean of collectively episodes of hamstring tightness in adult population was high, with the maximum probability described in individuals with sedentary life style. Extensibility problems for tightness of hamstring had been expressively greater among women. Hamstring tightness was associated with the essential deduction of body efficiency and life's quality and lower limb efficiency, as it is calculated via goniometer and symptoms' diary⁹.

The pre and post values of both, the Bent Leg Raise experimental Group and that of Traction straight leg raise experimental Group were markedly improved at all levels of assessment on both sides. Results of our study match with the results of these studies. The group with subjects in traction straight leg raise group were younger. That may have shifted average results slightly but still the other group i.e. Bent Leg Raise Group performed slightly better when we discuss the mean averages, although not statistically significant difference¹⁰..

Bent Leg Raise technique carries advantages of being simple, more focused and carrying fewer side effects in terms of undue stretches of musculotendinous endings. On the other hand traction straight leg raise technique shares a common feature of being simple and easier but it carries additional side effects such as that of over dose and proceeding soreness. Also the targeted part of muscles is not stretched¹¹.

Literature supports the efficacy of both techniques; however, there is more literature available in favor of traction straight leg raise technique. This may be due the fact that this matches to older and traditional technique. Also, there is not enough literature about comparison of both techniques. Except that a study found that was conducted on sportsmen in Nigeria which showed significant effect of bent leg raise technique. This may be due to the nature of subjects, that the sportsmen have high activity level¹²..

CONCLUSION

There was significant difference within both the groups of treatment in terms of improvement in range of SLR but; No significant difference was found in effectiveness of two techniques of Mulligan i.e. Bent Leg Raise Technique and Traction Straight Leg Raise Technique.

Conflict of interest: None.

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