



## STUDY TO COMPARE THE EFFECTIVENESS OF MULLIGAN'S BENT LEG RAISE AND TWO LEG ROTATION TECHNIQUES ON HAMSTRING FLEXIBILITY IN AMATEUR FOOTBALL PLAYERS

**Abhishek taru**

BPT (student) PES Modern college of physiotherapy, shivaji nagar pune.

**Dr. Kiran jeswani \***

MPT Assistant professor PES Modern college of physiotherapy shivaji nagar pune.  
\*Corresponding Author

### ABSTRACT

**Aims:** a study to compare the effectiveness of mulligan bent leg raise and two leg rotation techniques on hamstring flexibility in amateur football players

**Methods:** A study has performed in amateur football players who are prediagnosed with hamstring tightness. Subjects were divided into two groups group a for BLR technique and group b TLR technique. Active knee extension test was taken before and after treatment. Outcome score were compared and used to establish an effectiveness of treatment.

**Findings:** Within group A and group B while observing effectiveness of treatment of TLR and BLR mean value of goniometer Pretreatment was (rt)  $84 \pm 8.7$  and (lt)  $81.8 \pm 8.4$  in group A and (rt)  $81 \pm 6.6$  and (lt)  $79.4 \pm 8.0$  was in group B with  $p < 0.0001$  While post treatment mean value of goniometer is  $92 \pm 4.4$  rt and  $93.2 \pm 10.4$  lt treatment with  $t = 0.7286$  rt and  $t = 2.292$  lt with  $p < 0.0001$  in group A ( $p > 0.001$ ,  $t =$ )

**Conclusion:** The present study proves that both TLR and BLR techniques are effective in increasing hamstring flexibility. The study has shown a significant difference in TLR and BLR techniques.

Hence based on the result of the present study it can be concluded that TLR technique is more effective to improve hamstring flexibility than BLR technique in amateur football players of age group 17 to 35 with hamstring tightness.

**KEYWORDS :** Assess, Quality of Life, Elderly, Old Age Homes.

### INTRODUCTION

Hamstring consists of 3 muscles i.e. semitendinosus, semimembranosus and biceps femoris. It is situated in posterior aspect of thigh. It is a two joint muscle and its actions is flexion of knee and extension of hip. Hamstring muscle injury is a common athletic injury. Football is one of the oldest organized and the world's most popular sport, played in many countries worldwide. Due to its fascinating and exciting nature it has captured the attention of millions of spectators. Injuries to hamstring complex are common in sprinting sports like football. Football requires aggressive sprinting which requires flexible hamstrings to prevent injury. With 12% of all football injuries attributed to some kind of hamstring strain and around 53% of those hamstring injuries involve the bicep femoris<sup>(1)</sup> Players were 2.5 times more likely to sustain a hamstring strain than a quadriceps strain during game<sup>(1)</sup>

### Bent leg raise

is a Mulligan stretching technique which is a recent advancement in the treatment of hamstring tightness. It is a painless and advantageous technique, which is indicated to hamstring tightness with limitation of Straight leg raise. The Mulligan Bent Leg Raise (BLR) technique is used for improving range of straight leg raise (SLR) in subjects with LBP and/or referred thigh pain (Mulligan, 1999) [1] and also in order to improve flexibility of hamstring in clients with tight hamstrings.<sup>1</sup> The intention of this technique is to restore normal mobility and reduce LBP and physical impairment. It stretches the lower extremity muscles in combination of hamstring, adductors and rotators.<sup>(1)</sup> Mulligan's **Two Leg Rotation** is a new technique which has been developed by Dr. Brain Mulligan. It is effective in treatment of hamstring tightness. Mulligan's Two Leg Rotation Technique

(TLR) is a painless technique, and can be tried in any subjects with hamstrings tightness, low back pain and who has limited and/or painful straight leg raise (SLR). It can be extremely useful in patients who have a gross bilateral limitation of straight leg rising. TLR Technique is a new technique that has been developed by Dr. Brain R Mulligan and colleagues (2010). Limited Literature is available on the efficacies of Mulligan's TLR techniques in Hamstrings flexibility.<sup>(7)</sup>

### NEED OF THE STUDY

Football players have a high incidence of hamstring injuries.

Conventional studies for management of hamstring injuries are present.

There have been studies showing the effect of Bent Leg Raise on footballer players and there have been studies showing the effect of Two Leg Rotation on football players However, there has been a paucity of studies comparing the two. Hence, this study is an effort to compare the effect of bent leg raise and two leg rotation to improve the hamstring flexibility in amateur football players.

### AIM

To compare the effectiveness of Mulligan's Bent Leg Raise and Two Leg Rotation techniques on hamstring flexibility in Amateur football players.

### OBJECTIVES

To find the effectiveness of Mulligans Bent Leg Raise technique to improve hamstring flexibility in Amateur football players.

To find the effectiveness of Mulligans Two Leg Rotation technique to improve hamstring flexibility in Amateur football players.

To compare the effectiveness of Mulligans Bent Leg Raise and Two Leg Rotation techniques to improve hamstring flexibility in Amateur football players.

### HYPOTHESIS

#### NULL HYPOTHESES H<sub>0</sub>–

There is no difference between Mulligan's Bent Leg Raise and Two Leg Rotation techniques on hamstring flexibility in Amateur football players.

#### ALTERNATE HYPOTHESES H<sub>1</sub>–

Bent Leg Raise technique is more effective than Two Leg Rotation technique on hamstring flexibility in football Amateur players.

#### ALTERNATE HYPOTHESIS H<sub>2</sub>–

Two Leg Rotation is more effective than Bent Leg raise Technique on hamstring flexibility in football Amateur players.

### METHODOLOGY

- Sample Size - 30
- Study Setting – Football players in and around Pune

- Study Design –Comparative Study
- Study Sampling – simple random sampling

**MATERIALS**

- Pen
- Paper
- Goniometer
- Consent Form
- 

**INCLUSION CRITERIA**

- Football Players ( Amateur)
- Patients with hamstring tightness Active knee extension (Angle more than 15 degrees)
- Male subjects
- Age- 18yrs-35yrs
- Subjects willing to participate
- Subjects able to comprehend commands

**EXCLUSION CRITERIA**

- Recent surgeries on the lower limbs or back
- History of fractures of lower limb.
- Hamstrings injury in last 6 months

**OUTCOME MEASURES**

- Active Knee Extension Test
- Goniometer

**PROCEDURE**

Ethical clearance was obtained from the ethical committee of modern college of physiotherapy. Subjects were selected as per inclusion and exclusion criteria and the procedure was explained and a written consent was obtained from the subjects. Active knee extension test was performed to check for hamstring tightness. Subjects were divided into 2 groups, group A: bent leg raise group and group B: two leg rotation technique group, by Envelope method. Pre-treatment (day1) Active Knee Extension was performed. Treatment session: 1week intervention Daily one session

**Bent Leg Raise**

Position of patient: supine lying. Position of the therapist: stands at the limited hamstring flexibility side. Procedure: ask the subject to flex his hips till 90 degrees and heel off the plinth. The therapist places the knee of the affected side on his shoulders and flexes the subject's hips till a resistance is felt. When the resistance is felt, the therapist asks the subject to push the therapist shoulder gently and hold for 5 sec. The therapist then flexes the subject's hip further and holds for 30 sec. The procedure should be repeated for 3 times.

**Two Leg Rotation**

Position of subject: supine lying. Position of the therapist: stands at the limited hamstring flexibility side. Procedure: Both legs of the subject are flexed. Keeping subjects shoulders on the bed, the therapist takes the subjects legs slowly to the side of the limited hamstring muscle flexibility. When the subject reaches the limit/the position is sustained for 30 sec with over pressure applied by the therapist and then lower the legs to the plinth. Repeat for 3 repetitions, and 1 min rest in between each stretch.[7] 3 repetitions (30 sec hold) 1 min rest in between. Post treatment (day 7) active knee extension test will be performed.

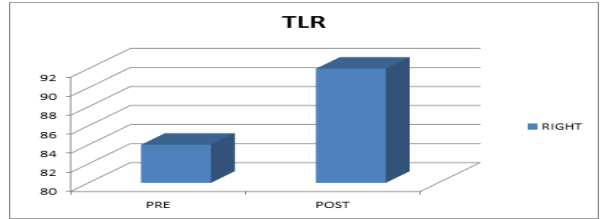
**ACTIVE KNEE EXTENSION TEST**

SUBJECT POSITION SUPINE ON THE PLINTH and the lower extremity not being measured was secured on the table with Mulligan's belt across the thigh. Subject then flexed his hip to 90 degree and subject was instructed to grasp behind the knee with both hands to stabilize the hip. Subject then actively extended knee as far as possible. Goniometer is used and active knee extension is measured.

**Statistical data Analysis**

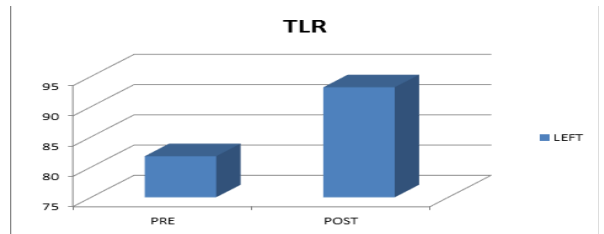
**Graph showing pre and post values of TLR on right side**

	PRE	POST	t value	p value
TLR (right) Mean + SD	84 + 8.7	92 + 4.4	5.17	0.0001



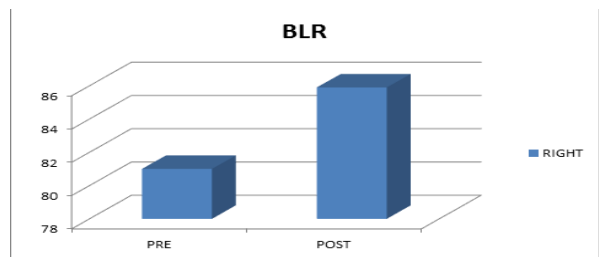
**Graph showing pre and post values of TLR on Left limb**

	PRE	POST	t value	p value
TLR (left) Mean + SD	81.8 + 8.4	93.2 + 10.4	7.020	0.0002



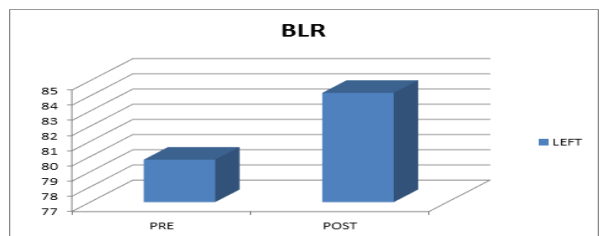
**Graph showing pre and post values of BLR on Right limb**

	PRE	POST	t value	p value
BLR (right) Mean + SD	81 + 6.6	81.5 + 7.5	3.340	0.0049



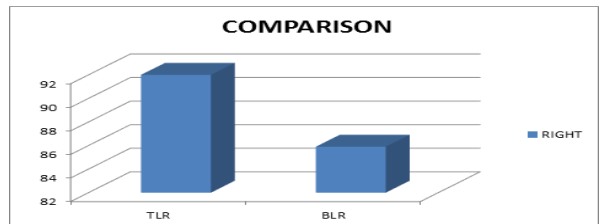
**Graph showing pre and post values of BLR on Left limb**

	PRE	POST	t value	p value
BLR (left) Mean + SD	79.4 + 8.0	84.2 + 7.9	4.146	0.0010



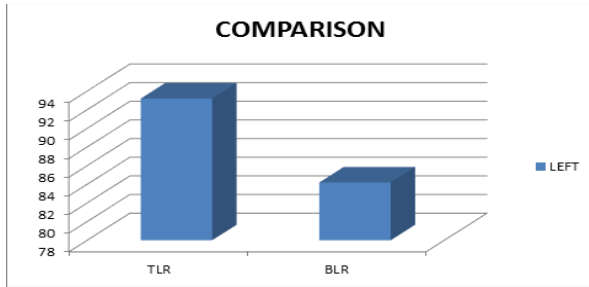
**Graph showing comparison of TLR v/s BLR post values on Right limb**

	TLR	BLR	t value	p value
Right Mean + SD	92 + 4.4	85.9 + 7.5	3.101	0.0044



**Graph showing comparison of TLR v/s BLR on Left limb**

	TLR	BLR	t value	p value
Left Mean + SD	93.2 + 10.4	84.2 + 7.9	2.632	0.0137

**Result**

Present study was conducted to compare the effect of TLR v/s BLR on Hamstring Tightness. Statistical analysis was done using InStat Software. Inter group analysis was done using paired t- test within the groups and unpaired t- test for comparison between the two group. The values  $p = 0.0001$  and  $t = 5.17$  was found in pre and post TLR on Right limb,  $p = 0.0002$  and  $t = 7.020$  on Left limb using paired t-test within the group. The values  $p = 0.0049$   $t = 3.340$  was found in pre and post BLR on Right limb,  $p = 0.0010$   $t = 4.146$  on Left limb using paired t- test. The values when compared between the groups were  $p = 0.0044$   $t = 3.101$  found in post TLR v/s BLR on Right limb and  $p = 0.0137$ ,  $t = 2.632$  was in post TLR v/s BLR on Left limb, respectively using unpaired t- test, hence considered significant.

**Discussion**

Tight hamstrings usually start as early at the age of 5 or 6 years when children start their seated school carriers, intensity of tightness increases at adolescents and peaks at 25 years when an individual involves in profession or get occupationally linked. The finding of this study co related with the above references since maximum number of subjects were in the age group of 17 to 35 years Subjects in the present study had hamstring tightness which was demonstrated by active knee extension method in this study. The aim of the study was to compare the effect of TLR v/s BLR on hamstring tightness. The result showed that there is significant difference between both the groups. There was a statistical difference in the pre and post values of TLR in right and left limb as well as in the values of BLR in right and Left limb which show that BLR and TLR both are effective .Various research over Mulligan's BLR methods suggests it as contract relax method were contract relax cycles applied to hamstrings provide peripheral somatic input to the contracting muscle. [5] The present study, suggests having a beneficial effect of TLR over BLR On hamstring tightness. The values when compared between the groups were  $p = 0.0044$   $t = 3.101$  found in post TLR v/s BLR on Right limb and  $p = 0.0137$ ,  $t = 2.632$  was in post TLR v/s BLR on Left limb, respectively using unpaired t- test. The alternate hypo has been accepted that TLR is more effective than BLR in amateur footballers. The beneficial increase in the hamstring flexibility post 7th intervention in TLR might be due to change in muscle stretch to tolerance and increased hamstrings viscoelastic properties caused during the application of TLR technique. The findings of this study co-relates with the previous study i.e., "Efficacy of Mulligan's two leg rotation and bent leg raise techniques in hamstring flexibility in subjects with acute low back pain".

And TLR can be the first option to improve hams flexibility in footballers

**Conclusion**

The present study proves that both TLR and BLR techniques are effective in increasing hamstring flexibility .The study has shown a significant difference in TLR and BLR techniques. Hence based on the result of the present study it can be concluded that TLR technique is more effective to improve hamstring flexibility than

BLR technique in amateur football players of age group 17 to 35 with hamstring tightness.

**LIMITATIONS**

Limited sample size. Study included only male subjects. Study was conducted only in football players. Universal goniometer was used which operates manually investigator[human] errors are unavoidable. Subjects could not be followed up after the study.

**FUTURE SCOPE OF STUDY**

- Study can be on professional football players and other sport population.
- Protocol duration can be increased.
- Study can be done using large sample size.
- Comparison can be done in female population.
- Future studies are required with long term follow up for the consistency of the effects.
- Immediate effect can be studied.

**CLINICAL IMPLICATIONS**

TLR technique can be applied on football players as it is found to be more effective on muscle tightness over BLR technique.

**REFERENCES**

1. Orchard WE, Ross rich f, epidemiology of injuries in the Australian football league, seasons 1997-2000. Brj sports med 2002; 36:39-41-
2. Hall T, Hardt S, Schafer A, Wallin L. Mulligan bent leg raise technique--a preliminary randomized trial of immediate effects after a single intervention. Man Ther 2006; 11(2):130-5.
3. Pratik.A.Phansopkar. Efficacy of Mulligan's two leg rotation and bent leg raise techniques in hamstring flexibility in subjects with acute low back pain. Res 2014;2(5):733-741.
4. Janda V: Pain in the locomotor system - A broad approach. In: Aspects of Manipulative Therapy, 148. Churchill Livingstone. Melbourne, 1985.
5. Mulligan manual therapy; NAGS SNAGS MWMS, etc 6th edition. 2010; 56-58.
6. Toby hall, Sonja hardt, axel Schafer mulligan bent leg raise tech randomised trial of immediate effects. Man ther. 2006; 11:130-135.
7. Gajdoksik R nandlusin, hamstring muscle tightness reliability of an active knee extension test.63; 1085-1088.
8. Cynthia C norkin et al: measurement of joint motion a guide to goniometry edition 4th 484.
9. Ekstrand, J. et al.: Lower extremity goniometric measurements: a study to determine their reliability. Arch Phys Med Rehab 63:171-175, 1982.
10. ZebasCJ, Rivera MS. Retention of flexibility in selected joints after cessation of stretching exercise program.1985; 181-191