

Effect of Mulligan Stretching Techniques (TSLR AND BLR) on Biceps Femoris Muscle and Pelvic Rotation by Using Surface EMG and Bubble Inclinometer Respectively

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Abstract

This study was aimed to investigate and compare the effectiveness of two Mulligan techniques (TSLR and BLR that is Traction Straight Leg Raise and Bend Leg Raise) in improving the biceps femoris muscle performance, flexibility and pelvic rotation. A total of 90 asymptomatic female subjects of 18 to 30 years age were taken which were randomly divided into three groups, that is, two experimental (A and B) and one control group (C). The pelvic rotation ROM, passive straight leg raise ROM and EMG activity were checked in all three groups, after that the BLR, TSLR and Hamstring Self Stretch was provided to Group A, B and C respectively. All the previous readings were checked again. TSLR stretching technique was found to decrease the EMG activity and increase the range of pelvic rotation and passive straight leg raise more than other two groups.

Conclusion: Mulligan TSLR stretch is more effective than BLR stretch in improving biceps femoris muscle performance, flexibility and pelvic rotation.

Key Words: Asymptomatic, Passive Straight Leg Raise, Surface EMG, Hamstring

Introduction

EMG has become a useful tool for the investigation of the muscle activity and hence provides an efficient technique for improving the activity of the muscle. The amount of torque produced by a muscle depends on the number of motor units activated, the muscle length, and the moment arm of the muscle. These variables have been studied in various combinations, but there is lacks of studies that have investigated the relationship among EMG activity, and muscle length before and after stretching as stretching is also a muscle lengthening procedure. During maximal isometric contraction, an increase in integrated Electromyographic activity and a decrease in torque occurs as the muscle is shortened, the opposite occurs when the muscle is in lengthened

positions. A greater difference in this relation is noted when the respective EMG activity and torque are held constant (*Lunnen et al, 1981*).

Mulligan bent leg raise (BLR) technique has been described as a means of improving range of straight leg raise (SLR) in subjects with LBP and/or referred thigh pain (*Hall et al, 2006b*). Mulligan has also described the traction straight leg raise (TSLR), which is said to improve the range of straight leg raise (SLR) in patients. Furthermore, it has been suggested that improving the range of SLR has a beneficial effect in restoring normal movement and reducing the degree of impairment due to low back dysfunction (*Hall et al, 2006a*). The present study has provided useful information about the internal as well as the visible changes in the muscle due to