

A Comparative Analysis of the Efficacy of Mulligan Bent Leg Raising Versus Slump Stretching Combined with SWD in Mechanical Low Back Pain

Okkagani Berranghi Obuun

Department of Health Sciences, Babcock University, Nigeria

ABSTRACT

The problem statement: Low back pain (LBP) is the most prevalent, self-reported form of musculoskeletal pain, frequently recurrent, and carries significant socio-economic implications. Approximately eighty percent of low back pain is attributed to "mechanical back pain," resulting from muscle strain or ligament tear in the back. The muscular strain and ligament sprain result from abrupt, unfamiliar exercises and incorrect posture. Methodology: The participants were recruited through Sri Venkateshwara Medical College Hospital and Research Centre, Ariyur, Pondicherry-605 102. The objective of the study was to evaluate the efficacy of Mulligan Bent Leg Raising (MBLR) compared to Slump Stretching combined with SWD in alleviating pain and enhancing Straight Leg Raise (SLR) in cases with mechanical low back pain. Outcomes: The statistical analysis derived from the unpaired t-test indicates that the post-test values for range of motion and pain in Group A and Group B are 5.39 ($p < 0.001$) and 5.43 ($p < 0.001$), respectively. The statistical study revealed a considerable difference between Group A and Group B, with Group A demonstrating more effectiveness. The study concluded that the Mulligan bent leg raise, in conjunction with SWD, was beneficial in treating mechanical low back pain in college students.

Keywords: Mulligan Bent Leg Raise, Short Wave Diathermy, Slump Stretching.

INTRODUCTION

Low back pain is the most often reported musculoskeletal pain, frequently recurs, and has significant socio-economic implications. Unilateral pain without referral below the knee is termed mechanical low back pain or lumbago. The Mulligan bent leg raise is a non-painful treatment suggested for people with low back pain who experience limited or unpleasant straight leg raising [1]. Slump stretching is a technique utilized to enhance motor performance, involving the application of physical and mechanical force to extend structures that have adaptively shortened.

RESEARCH ELABORATIONS

This comparative study encompasses 30 patients from the Department of Physiotherapy at Sri Venkateshwaraa Medical College Hospital and Research Centre, located in Ariyur, Pondicherry-605 102. Participants were categorized into two groups (Group A - 15 and Group B - 15). The subjects were included according to the selection criteria. The study's inclusion criteria were subjects aged 23 to 45 years, exhibiting a unilateral limitation of straight leg raise exceeding 45 degrees, and encompassing both genders. Patients experiencing low back pain primarily localized to the buttock or distal thigh and individuals willing to participate in the study were included. Exclusion criteria included individuals exhibiting clinical features of lower quarter neurological symptoms (e.g., sensory loss, motor loss, abnormal reflexes, and bowel and bladder dysfunction) [2]. Patients exhibiting multiple spinal abnormalities, spondylosis, spondylolisthesis, lumbar canal stenosis, and disc herniation. Previous history of significant spinal surgery and pregnancy preclude participation in the trial [3]. In both groups, the subjects' pretest and post-test results were obtained using a goniometer for passive straight leg raise range of motion measurements. Visual Analogue Scale for Pain Assessment. The trial lasted 3 months, during which subjects underwent Group A Mulligan Bent Leg Raising and Group B Slump Stretching for 4 weeks.

Prior to administering MBLR and SLUMP stretching, SWD was applied to the patient using the coplanar electrode implantation method in the lumbar area for 15 minutes per session. The patient has been instructed to report any increased heat during the therapy time. The patient is supine, positioned at the edge of the couch. The patient's hips and knees are flexed at a 90-

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degree angle, with the heel resting on the plinth. The therapist's position is to adopt a walking stance on the affected side. The shoulder of the inner hand is positioned beneath the popliteal fossa. The therapist secures the distal portion of the thigh with both hands and applies longitudinal traction along the femoral axis. The therapist flexes the hip until the initial resistance is encountered. When the therapist encounters resistance from muscle tightness or the patient experiences stretch pain, the contract-relax technique is employed by instructing the patient to gently push against the therapist's shoulder for five seconds. The therapist may advance the patient's hip into further flexion if it is pain-free. If patients experience pain during the technique, the hip may be positioned into abduction or external rotation with increased traction prior to the addition of more hip flexion. Maintain the position for 20 seconds and repeat it three times within a single session. MBLR has been conducted four times weekly for a duration of four weeks. The patient is positioned on the edge of the sofa with legs supported, hips in a neutral alignment, and hands clasped at the side. The therapist should induce thoracic and lumbar flexion by slumping the back. The therapist thereafter employs one arm to exert overpressure on the shoulders to sustain flexion of the thoracic and lumbar spine. The therapist thereafter exerts overpressure on the cervical region while sustaining flexion of the entire spine [cervical, thoracic, lumbar] [4]. The therapist maintains the patient's foot at maximum dorsiflexion for 30 seconds, repeating this three times in one session. Four sessions have been conducted weekly for a total of four weeks.

RESULTS AND DISCUSSIONS

The collected data were evaluated utilizing both the paired and unpaired t-tests and thereafter tabulated. The computed 't' values from the paired 't-test' for group A (within-group analysis) of the PSLR and VAS tests, with 14 degrees of freedom and a 5% significance threshold, were 32.63 and 49.95, while for group B, they were 13.45 and 33.8, accompanied by the p-value.

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Table 1 Values of the Paired 'T' Test

GROUP		MEAN		SD		Calculated 't' value		Table 't' value	P VALUE	
		PSLR	VAS	PSLR	VAS	PSLR	VAS		PSLR	VAS
GROUP A	PRE-TEST	60.73	66.33	3.807	5.814	32.63	49.95	2.14	<0.05	<0.05
	POST-TEST	82.66	19.66	4.715	5.164					
GROUP B	PRE-TEST	58.66	65.66	5.703	5.627	13.45	33.88	2.14	<0.05	<0.05
	POST-TEST	73.6	27.66	2.772	4.952					

Table 2 Intergroup Analysis of Groups A and B

GROUPS	MEAN		SD		t – Value		p-value	
	PSLR	VAS	PSLR	VAS	PSLR	VAS	PSLR	VAS
GROUP – A	56.88	57.54	7.671	7.390	41.336	40.436	<0.001	<0.001
GROUP – B	53.33	53.54	8.052	7.389				

This study aimed to examine the efficacy of Mulligan Bent Leg Raising and Slump Stretching combined with SWD in alleviating pain and enhancing SLR in patients with mechanical low back pain. The study's results indicated that group A's Mulligan Bent Leg Raising and group B's Slump Stretching exhibit significant differences in PSLR and VAS. Group A is somewhat more effective than Group B. The objective of this study was to compare the efficacy of Mulligan Bent Leg Raising and Slump Stretching in patients with low back pain. The findings of this investigation indicate that MBLR procedures markedly alleviate discomfort and enhance the range of motion of PSLR compared to the slumped technique [3]. Comparative Efficacy of Slump Stretching Versus Conventional Physiotherapy in the Management of Subacute Non-radicular Low Back Pain. The outcome indicates that significant differences were seen at the conclusion of the 2nd, 3rd, 4th, and 5th weeks ($p = 0.0185$, $p =$

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0.000, $p = 0.000$, and $p = 0.000$, respectively) between the two groups, favoring the experimental group. The analysis of MODI scores between the two groups revealed significant differences at the end of the 1st week ($p = 0.4375$), 2nd week ($p = 0.4515$), 3rd week ($p = 0.078$), and 4th week ($p = 0.0865$). At the follow-up (5th week), a substantial difference was observed between the two groups. The study concludes that the combination of slump stretching and conventional physiotherapy is more advantageous than conventional physiotherapy alone in alleviating pain in patients with non-radicular subacute low back pain. The outcomes of this investigation provide substantial evidence supporting the research conducted by Saunabh Gupta (2006). He evaluated the immediate effects of the Mulligan Bent Leg Raise technique on restricted straight leg raises in patients with mechanical low back pain. Nevertheless, 24 hours later, there was a notable rise of 7 degrees in the range among the BLR group, which could be clinically meaningful. Furthermore, there was a one-point decrease in pain; however, there was no distinction between the groups. The results indicate that both groups demonstrate efficacy, with Group A's Mulligan Bent Leg Raising being more beneficial than Group B's Slump Stretching in addressing mechanical low back pain.

CONCLUSIONS

This study concludes that Group A—Mulligan Bent Leg Raising—is superior to Group B—Slump Stretching—in patients with mechanical low back pain. Limitations include a restricted number of subjects. There was a significant disparity in the age demographic, with participants ranging from 23 to 45 years old. Extended follow-up over four weeks revealed that patients struggled to adhere to the program. Randomized trial cohorts were selected. Participants from various professions and differing exercise levels were included, perhaps introducing variability in the outcomes. The study exclusively employed two result-measuring scales. Suggestions are that future research may broaden the patient population, incorporate home programs such as self-stretching, and include ergonomic modifications if necessary.

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