Original Article

Effectiveness of slump neural mobilization technique for the management of chronic radicular low back pain

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Objective: To determine the effectiveness of slump neural mobilization technique (SNMT) compared with lumber stabilization exercise (LSE) and shortwave diathermy (SWD) in the physical therapy management of chronic radicular low back pain (CRLBP).

Methodology: A sample of 40 patients with CRLBP was selected and randomly placed into two groups. The group A consisted of 22 patients treated with SNMT, LSE and SWD. The group B consisted of 18 patients treated with LSE and SWD only. All were assessed by four point pain scale and Oswestry disability index (ODI) at the baseline and at the completion of three weeks at 5 days per week and 30 minutes single session per day.

Results: Both groups demonstrated significant improvement in pain score, from mean score 3 to 1 in experimental group and 3 to 2 in control group. The function was also improved in both the groups with mean score from 52 to 14 in experimental group and 29 to 20 in control group ($p<0.001$ for pain and $p<0.001$ ODI score).

Conclusion: SNMT along LSE and SWD improved pain and function more as compared with LSE and SWD alone during the physical therapy management of CRLBP. (Rawal Med J 201;40: 41-43).

Keywords: Slump neural mobilization technique (SNMT), lumbar stabilization exercise (LSE), shortwave diathermy (SWD), neural mobilization. Chronic low back pain (CLBP).

INTRODUCTION

Radicular pain is a type of low back pain which radiates into the lower extremity and follows the dermatomal pattern due to the irritability of the nerve roots at the lumbosacral spine.[1] Neural mobilization is a type of therapeutic exercises designed to influence peripheral nerve mechanics and physiology, initially focused to alter the effects of adverse neural tension.[2] Chronic low back pain is the back pain which lasts more that 7 to 12 weeks. About 2 % of the US workforces are compensated for back injuries each year.[3] The annual prevalence of back pain ranges from 15 to 45% with point prevalence averaging 30%.[4] Although the point prevalence and 1-month prevalence was higher in females as compared to males regardless of the age, there was no significant difference in the 1-year prevalence.[5] Advanced imaging should be reserved for patients who are considering surgery or those in whom systemic disease is strongly suspected.[7]

There is no firm evidence for the presence or absence of a causal relationship between radiographic findings and non-specific low back pain.[8] Neurodynamics test is used as a diagnostic tool before application of a neural mobilization technique. This is a series of body movements that produce mechanical and physiological events in the nervous system according to the movements of the tests.[9] The role and effectiveness of the neural mobilization techniques and Neurodynamics are evident from the existing literature but no comparison was found on the combination of other physical therapy techniques with and without neural mobilization techniques. The objective of this study was to determine the effectiveness of slump neural mobilization technique compared with lumber stabilization exercise and shortwave diathermy in the physical therapy management of chronic radicular low back pain.

METHODOLOGY

A randomized controlled trial was conducted from

January to August 2014 in an outpatient physical therapy department of a general hospital in Rawalpindi, Pakistan. The study sample consisted of individuals between the age of 20 to 60 years, with CRLBP with reproduction of symptoms with slum test. Subjects were excluded if their symptoms were consistent with spinal infection, neoplasm, osteoporosis, spinal fracture, demonstrated positive neurologic signs or symptoms suggestive of nerve root involvement (diminished lower extremity re?exes, sensation to sharp and dull, or strength), or signs of upper motor neuron involvement. In addition, subjects were excluded if they were pregnant, had a history of spinal surgery. The study was approved by the ethical committee at Riphah College of Rehabilitation Sciences and an informed consent was obtained. Before randomization, subjects completed several self-report outcome measures. The four point numeric pain rating scale (NPRS) with 0 representing 'no pain' and 4 representing 'worst pain' was used to measure the intensity of their current pain.

The participant's perceived disability was assessed by using modi?ed Oswestry disability questionnaire (ODI). The ODI features 10 items scored from 0 to 5. The sum total score of all 10 items is doubled and represented as a percentage from 0100, with a higher total score indicating greater disability. Subjects in group A received slump slider neural mobilization and stabilization exercise and shortwave diathermy and group B had stabilization exercises with shortwave diathermy alone. The outcome measures of NPRS and ODI were captured at at end of three weeks.

Statistical analysis was performed using SPSS version 21. Both study groups were compared by using paired t test for pain scales and Oswestry disability index (ODI), with 95% level of significance to determine the efficacy of SNMT and SWD. Paired T test was applied to the pain scores and ODI scores.

RESULTS

There were females in both groups (Table 1). Both groups showed significant improvement in pain score, from mean score 3 to 1 in experimental group and 3 to 2 in control group. The function was also improved in both the groups as assessed by ODI mean score from 52 to 14 in experimental group and 29 to 20 in control group.

Table 1. Age and gender distribution of the study sample.

Study Group	Age	Gender	
	Mean	Male	Female
Group A	34.32±8.94	04	18
Group B	33.22±7.16	06	12

Table 2. Changes in pain score and ODI score after 3 weeks of intervention.

Score	Group A (n=22)		Group B (n=18)	
	Std.deviation	p-value	Std.deviation	p-value
Pain score	**0.858 ± 0.183**	**<0.001**	**1.305 ± 0.308**	**0.003**
ODI score	**1.490± 0.318**	**<0.001**	**2.910 ± 0.686**	**0.163**

Statistically the group A showed more significant results ($p<0.001$ for pain and $p<0.001$ ODI score) as compared to group B ($p=0.003$ for pain score and 0.163 for ODI score), shown in Table 2.

DISCUSSION

Both groups showed significant improvement in pain score. This is consistent with findings of previous studies that neural mobilization decreases pain to considerable level. The long term effects of neural mobilization techniques are uncertain, as no follow up has been reported beyond one week. Manipulative therapy is found to be more effective in acute low back pain whereas exercises are more effective in chronic low back pain.[10] SLR stretching in addition to lumbar spine mobilization and exercise was beneficial in improving pain, reducing short-term disability and promoting centralization of symptoms in this group of patients.[11] Neural mobilization along with conventional treatment was found out to be more effective in relieving low back pain as well as improving the range of SLR than conventional treatment alone.[12]

McKenzie treatment along with control treatment was more effective as compared to neural mobilization technique.[13] Self Neural Mobilization during Intermittent Pelvic Traction was effective in reducing Low back pain as compared to pelvic traction alone.[14] Slump stretching is better than straight leg raise stretching in improving the range

of passive straight leg raise.[15] Nagrale et al concluded that slump stretching with spinal mobilization and spinal stabilization exercises was more effective rather use alone. [16]Qualitative analysis of studies revealed that there is limited evidence to support the use of neural mobilization.[3] Single case report showed use of neural mobilizations with patients presenting with lower extremity neurogenic pain.[17]

CONCLUSION

Physical therapy interventions with the help of slump neural mobilization technique is more effective as compared to traditional treatment with lumbar stabilization exercises and shortwave diathermy for the management of chronic radicular low back pain.

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