

Effectiveness of Neural Tissue Mobilization and Conventional Physiotherapy compared with conventional physiotherapy alone in Chronic Mechanical Radiating Low Back Pain patients attended at CRP

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Abstract

Background: High prevalent LBP affects general people leading to functional limitation and disability having radicular pain and weakness towards lower limbs limiting socio-economical life. **Objectives:** This study aimed to measure the effectiveness of neural mobilization along with conventional physiotherapy treatment over chronic mechanical radiating LBP by deducting pain intensity and improving functional ability. **Methodology:** Experimental study design which was Randomised Control Trial (RCT) by selecting two groups control and experimental. There having 10 subjects in each group nominated by inclusion and exclusion criteria through randomization. All the participants of both groups were given by conventional physiotherapy treatment except experimental group that was treated by neural mobilization along with conventional physiotherapy treatment. At the beginning of session and after 10 sessions of physiotherapy treatment, data was collected through Dallas pain scale, Sciatic Bothersome scale and Oswestry Low Back Pain Disability Questionnaire. Un-related't' test was done for finding out significant level. **Results:** The mean age was 36.40 (± 12.69) in experimental group and 35.30 (± 11.37) in control group. The male and female ratio was 3:2. There were significant differences in experimental group than control group by different questionnaire. The Oswestry disability index (ODI) score was 59.00 (± 23.001) in experimental group and 55.80 (± 17.37) in control group. Among the participants of experimental group (n=10), 40% participants (n=4) had bed-bounded disability & 60% participants (n=6) were with severe to moderate disability at the initial assessment where there was no participants was found in that group of disability in the final assessment. On the other hand, in control group (n=10), 50% participants (n=5) had crippled & 50% participants (n=5) were with severe to moderate disability at the initial assessment where final assessment only 1(one) participant was without disability and rest of them was severe to moderate disability. After treatment the scores were 14.00 (± 5.578) and 42.00 (± 10.198) as for the t value of Oswestry disability index was 7.618 and p value 0.001. In Dallas pain scale was mostly significant in experimental group than control group. According to unrelated t-test, significant difference was found among the 14 domain out of 15 in experimental group than control group. Sciatica Bothersome scale was also significant in experimental group than control group. According to unrelated t-test, the result was significant in three domains out of 4 except feelings of weakness in leg. **Conclusion:** Neural mobilization with conventional physiotherapy treatment was more effective than conventional physiotherapy alone for treating patients with chronic mechanical Radiating LBP where it has beneficial effects on pain reduction, minimization of functional disability and increase functional activities of daily living.

Key words: Chronic Mechanical LBP, Neural Mobilization, Conventional Physiotherapy

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Introduction

The worldwide most common musculoskeletal problem is low back pain; around 80% people are affected by low back pain in their life time (Friedly, et al., 2010). Low back pain (LBP) is known globally as prime contributor to Years Lived with Disability (YLDs) (Hammill, et al., 2008). It is the absolute cause of disability in developed countries (Connelly, et al., 2006) and also for developing countries (Hoy, et al., 2012). It also creates a substantial personal,

community, and financial burden globally (Hoy, et al., 2012). Lumber radiating pain has a reported annual incidence of 83.2 per 100000 and an increased prevalence in the fifth decade of life among the general population (Polston, 2007). People with chronic low back pain are more likely to seek care and they use more health care service, for these reason there is increased medication prescription and visit to physician, physiotherapist and chiropractors (Freburger, et al., 2009). Patients who are suffering

from the symptoms of this condition frequently attend for physiotherapy interventions (Boyle et al., 2012). Morlion(2013) discussed that recently low back pain is treated mainly with analgesics and alternative treatments include physical therapy and rehabilitation; and spinal manipulation where disc surgery remains the last option when all other strategies have failed. Conventional treatments included non-steroidal anti-inflammatory drugs, back muscle soft tissue mobilization, pelvic floor strengthening exercise, back muscles strengthening and leg muscle strengthening with therapist supervision, spinal mobilization, manipulation, stretching, general mobility exercises and educational booklet with back care advice is used for the LBP with radiating pain (Stanos, et al., 2004).Neural mobilization techniques are used in the instances of altered Neurodynamics or altered neural tension and it aims to restore the relative mobility of the neural tissue and surrounding mechanical interfaces, reducing intrinsic pressures and regaining optimum physiological function (Malik,etal.,2012).

Objectives

To identify and analyse the effectiveness of the neural mobilization given along with the conventional Physiotherapy for chronic mechanical radiating low back pain patients.

Specific objectives

1. To assess the effectiveness on pain of Neural Mobilization with conventional Physiotherapy for chronic mechanical radiating back pain patients.
2. To find out the effect of Neural Mobilization to reducing disability level.
3. To identify the improvement of neurological status by neural mobilization.

Methods & Materials

The study was designed using an experimental design quantitative research which was Randomised Control Trial (RCT). The aim of this study is to evaluate the effectiveness of physiotherapy treatment combining Neural Mobilization along with the Conventional physiotherapy treatment in chronic mechanical radiating low back pain patients. Neural Mobilization and Conventional Physiotherapy was applied to the experimental group and only Conventional Physiotherapy was applied to the control group. It a single blinded technique where participants were not informed who were experimental and control grouping. Data was collected from the outpatient

Musculoskeletal Unit of Physiotherapy Department at CRP, Savar, Dhaka-1343. Because these patients came at CRP from all over the Bangladesh for comprehensive rehabilitation services, so this data reflects the entire population. The study was conducted in between July, 2016 to November, 2016. A screening process was conducted among 210 patients of mechanical low back pain based on inclusion and exclusion criteria of this study to identify the potential participants of this study who registered at the musculoskeletal department of CRP, Savar in 1st to 31st July, 2016. After that, a Sampling frame was prepared by 140 total number of chronic mechanical radiating low back pain patients. Then a Systematic sampling procedure was carried out to select the study population from the sampling frame. Consequently 20 participants were selected for this study. Finally a simple random sampling process was followed to allocate the participants in experimental and control groups.

Inclusion criteria

- * Patients with chronic low back pain (more than 3 months) (Freburger, et al., 2009).
- * Mechanical low back pain with radiation to the thigh, leg and foot.
- * Age group: 16-60 year. These age group patients were usually affected by chronic LBP (Davies, et al., 2008).

Exclusion Criteria

- * Low back pain due to specific pathologies such as tumour, TB spine, malignancy, infection and severe osteoporosis.
- * All sorts of systemic arthritis like Rheumatoid Arthritis, Ankylosing Spondylitis.
- * Patients with mechanical low back pain associated with bowel and bladder incontinence.
- * Any history of spinal and hip surgery.
- * Patients who had history of recent fracture, dislocation etc.
- * Any epidural injection in the last 6 months.
- * Current history of psychiatric disorders or under psychological treatment.
- * History of physiotherapy intervention for present problem.
- * Patient who takes medication for low back pain.

Procedure of Neural Mobilization

Participants were given a comfortable supine lying position. In this technique gentle and firm movements,

through and end range was applied. Passive mobilizations were applied. The subjects were treated with neural mobilization 6 to 8 repetition during each session. The researcher used the structured questionnaire for collecting data. In a brief, after screening the patient at department, the patients were assessed by a graduate physiotherapist. Every subject has received 10 sessions of physiotherapy treatment (3 per week). A pre-test (before intervention) and post-test (Before 11th sessions of intervention who are

completed 10th sessions intervention) was administered with each subject of both groups. The data was collected by using a written questionnaire form. Data was gathered by Dallas pain questionnaire, Oswestry Disability Index, Sciatica Bothersome questionnaire form and structural questionnaire was used for the socio-demographic indicators. Bengali Questionnaires was used for easy understanding for the participants.

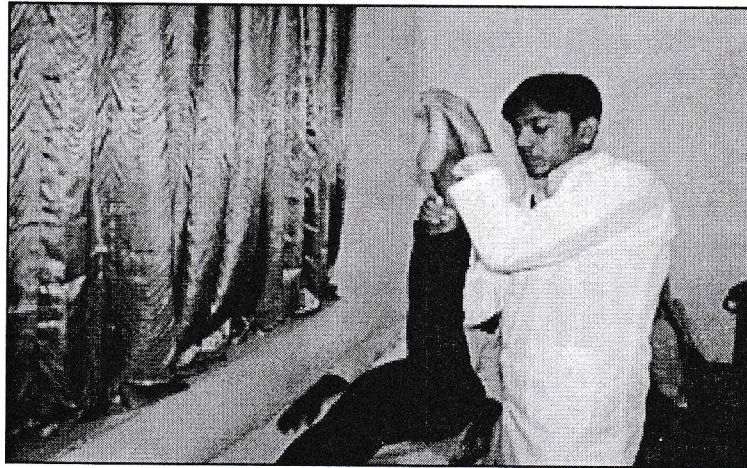


Fig1: Neural Mobilization Technique

Results& Discussions

Among the participants, ages were in between 16-60 years with mean age was 35.85 years (36.4 years in experimental group with SD of 12.69 and 35.3 years with SD of 11.37 in control group) where more frequent age range were 28-50 years. Among all participants 60% (n=12) were Male (30% in experimental and 30% in control group) and 40%

(n=8) were female (20% in experimental and 20% in control group).

Cause of pain

In this study, 40% (n=11) participants had the cause of pain (15% in experimental group and 25% in control group) and 60% (n=9) participants had unknown cause of pain (35% in experimental group and 25% in control group).

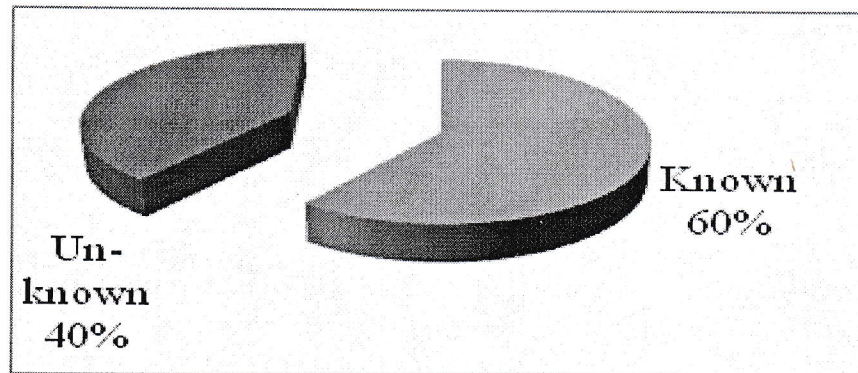


Fig 2: Causes of pain

Unrelated 't' test

Dallas Questionnaire	t	df	Sig.
Pain Intensity	4.753	18	.001
Pain intensity at Night	2.285	18	.035
Interfere with lifestyle	4.207	18	.001
Pain severity at forward bending activity	3.907	18	.001
Back Stiffness	5.802	18	.001
Interfere with Walking	4.652	18	.001
Hurt when Walking	3.158	18	.005
Pain keep from standing still	4.190	18	.001
Pain keep from twisting	3.526	18	.002
Sit in upright hard chair	3.833	18	.001
Sit in soft arm chair	3.622	18	.002
Pain in lying	2.387	18	.028
Pain limit normal lifestyle	3.858	18	.001
Interfere with work	4.702	18	.001
Change of workplace	1.421	18	.172

Oswestry Disability Index		df	Sig.
7.618		18	.001

Bothersome Questionnaire	t	df	Sig.
Feeling of leg pain-Final	2.678	18	.015
Feeling of numbness-Tingling sensation in leg-Final	2.605	18	.018
Feeling of weakness in leg-Final	1.809	18	.087
Feeling of back pain or leg pain in sitting-Final	3.216	18	.005

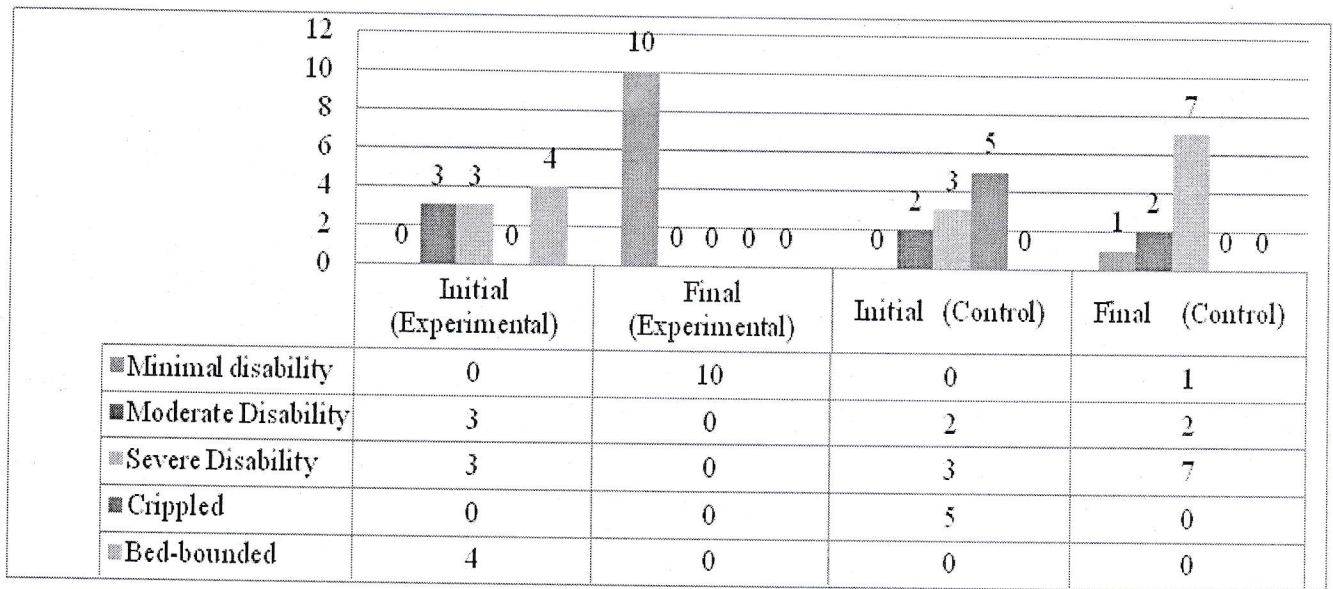


Figure 3: Disability among the participants

The results of this study show that Neural Mobilization along with Conventional Physiotherapy treatment approach is more effective for chronic mechanical Low Back Pain patients compared with Conventional Physiotherapy. At the beginning of session and after 10 sessions of physiotherapy treatment, data was collected through Dallas pain scale, Sciatic Bothersome scale and Oswestry Low Back Pain Disability Questionnaire. Significant improvements occurred in most of the measures by unrelated t-test between groups and paired t-test for within groups. The mean value of age of both groups was 35.75 years (36.4 years in experimental group and 35.3 years in control group) where SD was ± 12.69 . The male was 60% and female was 40% in the both groups. Among the Dallas pain scale indicators, Change of workplace did not found statistically significant at p value 0.05% where others indicators were significant in the experimental group in paired t test ($p < .05$ or more p value). On the other hand, indicators as general pain intensity, night pain intensity, pain interference with lifestyles, pain at forward bending activity, back stiffness, interference with walking, hurts with walking, standing still, twisting activity, upright hard chair sitting, soft arm chair sitting, lying in bed, pain limit normal life, pain interfere in work found statistically significant ($p < .05$) where only one indicator change of workplace was not significant in the control group in paired t test. So,

there was no significantly difference of Dallas pain scale between experimental group and control group. In comparison between experimental to the control group, mean difference of the Dallas indicators had shown higher mostly in experimental group than control group. According to unrelated t-test, significant difference was found in experimental group for all the indicators except change of workplace ($P=0.01$). Oswestry disability index (ODI) was used to evaluate the level of disability impacted by the chronic mechanical radiating low back pain to the subject wherein experimental group, the initial ODI score was 59.00 (± 23.001) where after 10 sessions of physiotherapy management final score was 14.00 (± 5.578). In case of control group, the initial ODI score was 55.80 (± 17.37) which was deducted in 42.00 (± 10.198). Among the participants of experimental group ($n=10$), 40% participants ($n=4$) had bed-bounded disability at the initial assessment where there was no participants was found in that group of disability in the final assessment. On the other hand, there were no participants ($n=0$) with bed-bounded disability among the control group ($n=10$). Beside this, 50% participants ($n=5$) were with crippled disability in the initial assessment whilst no participants ($n=0$) were present with those group of disability after the final assessment. Number of participants with severe disability in experimental and control group was three but after physiotherapy treatment session this number

turn into zero in experimental group but seven in control group. In this study, unrelated t-test done for ODI, showed the $t=7.618$, $df=18$ and the results were found significant at $p=0.001$ ($p<.05$) for experimental group which indicated that Neural Tissue Mobilization along with conventional Physiotherapy for chronic mechanical radiating low back pain patients were more effective rather than conventional physiotherapy only. It had found that the mean disability for control group was in moderate level (55.8%) at the initial day which was also in moderate level (42%) at the final day. On the other hand, the mean disability for experimental group was in severe level (59%) at the initial day and in moderate level (14.0%) after treatment. Ellis & Hing, (2008) concluded that neural mobilization can be used for treatment of Neurodynamics dysfunction and has positive therapeutic benefit as we have explored that the disability rates in aspect of Oswestry disability index results a better outcome in this study among the experimental group. Sciatica bothersome index evaluate the outcome level in comparing of Experimental group to the Control group, it has been shown that the experimental participants response a positive feedback in all four domains of sciatica bothersome index where all the progress remains negative in all aspect of the questionnaire within the Control group. According to unrelated t-test, the result was significant in three domains except weakness in leg ($p<.05$).

Conclusion and recommendation

Significance of Neural Mobilization along with conventional physiotherapy for treating patients with chronic mechanical Radiating LBP was an experimental design to examine the effectiveness where the results demonstrated that combination of techniques are significantly capable of producing beneficial effects on pain reduction, functional disability minimization and improving spinal mobility in patients with chronic low back pain. Reduction of pain and associated symptoms as well as reduction of functional disability may be helpful for patient to increase functional activities of daily living. Despite the limitations of this study, the results might be more acceptable if it would be with increased sample size.

As the data of this study was collected from only one clinical setting; so it could be better to collect data from different clinical setting. The quality of this study would be more if the time was not constraint.

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