

EFFECTS OF CORE STABILIZATION WITH AND WITHOUT CONVENTIONAL PHYSICAL THERAPY FOR THE MANAGEMENT OF NON-SPECIFIC LOW BACK PAIN

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Abstract

Objectives: The purpose of the study was to examine the effects of core stabilization exercises with conventional physiotherapy for the management of non-specific low back pain (LBP).

Methodology: This experimental comparative study was conducted at Department of Physiotherapy, PSRD hospital, Ferozpur Road Lahore. The study involved 40 subjects diagnosed with non-specific LBP with age ranges from 18 – 65 years. Patients were randomly allocated into 2 groups:

Group – A (Experimental Group): This group was

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treated with core stabilization exercises and conventional physiotherapy.

Group – B (Control Group): In this group, patients were treated by conventional physiotherapy alone. The outcome measures were pain and physical functional outcomes. Pain was measured by using Visual Analogue Scale (VAS) and the physical functional outcomes of patients were measured by using Modified Oswestery Disability Questionnaire (MODQ).

Results: By applying paired t-test in group – A, the p-values obtained for VAS and MODQ were statistically significant (i.e., $p = 0.000$, $p = 0.000$ respectively) while in group – B, the p-values for VAS and MODQ were also found to be significant ($p = 0.000$, $p = 0.000$ respectively). By applying repeated measure analysis of variance (ANOVA), p-values were found to be insignificant for VAS ($p = 0.09$) and MODQ ($p = 0.018$).

Conclusion: Both groups showed improvement in severity of pain and functional activity but the group-A that was given core stabilization exercises along with conventional treatment showed same improvement in pain and functional status as shown by group-B so any of the intervention can be used to gain better results as both are equally effective.

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Introduction

The purpose of this study is to determine the effectiveness of different physical therapy techniques for the management of patients with non-specific LBP.

Low back pain is a pain which is localized between twelfth rib and the lower gluteal folds (low back), with pain radiating to either both legs or no radiation.¹ In non-specific LBP there is no definite cause or reason. Specific LBP is due to some known cause or due to specific pathology such as disc prolapse, inflammatory conditions, tumors, osteoporosis, fracture, herniated nucleus pulposus.² In about 5 – 10% cases specific cause is known but in most cases it is non-specific.¹ There are a number of causes for LBP with pain radiation or without pain radiation; these are degenerative, idiopathic, congenital, inflammatory, traumatic, renal, gynecological, postural, neoplastic, metabolic, mechanical or rectal systemic causes.³ In United States, LBP is second to common cold causing absence from work place.⁴ The risk factors for LBP are life style, age, gender, occupation, socioeconomic status and smoking.⁵

Conventionally many techniques are used to decrease the pain and symptoms and improving functional status of patient. Medications such as pain killers, NSAIDS, naproxen ibuprofen, analgesics,⁶ opioids, muscle relaxants,⁷ and steroids are used.

Other conventional modalities used are heat therapy, manual or mechanical traction, short – wave diathermy (SWD), therapeutic ultrasound, transcutaneous electrical nerve stimulator (TENS), massage and therapeutic exercises.⁸

Core stabilization exercises showed effectiveness in treating LBP. The main aim of core stabilization exercises is to improve spinal stability, strength, endurance and function while decreasing pain.

Strengthening of core musculature play an important role in improving stability of spine and decreasing pain associated with instability.⁹ Core stabilization exercises target on the stabilization of abdominal, para-spinal and gluteal muscles. The core stability exercises include abdominal curls up, oblique curls up, side – bidge, quadruped exercises and then progression of these exercises.

Materials and Methods

Study Design: Experimental comparative study.

Study Setting and Duration: It was a time – based

study conducted at Department of Physiotherapy, PS-RD hospital, Lahore from Oct, 2013 – Jan, 2014.

Sample Size: A sample of 40 was analyzed.

Sample Selection Criteria

Inclusion Criteria: Patients diagnosed with non-specific LBP with age ranges from 18 – 6 years, of either gender were selected.

Exclusion Criteria: Patients with malignancies, tumors, spinal infections, ankylosing spondylitis, fever, chills, and weight loss were excluded.

Sampling Technique: Systematic sampling (a type of random sampling) was used in which all even ordered patients (2nd, 4th, 6th, 8th, etc.) were included in group-A and all odd ordered patients (1st, 3rd, 5th, 7th, etc.) were included in group – B.

Study Groups: Each group consisted of 20 patients.

Group – A (Experimental study): In this group, patients were treated with core stabilization exercises and conventional physiotherapy.

Group – B (Control Group): In this group, patients were treated by conventional physiotherapy alone.

Data Collection Procedure: Patients in the group-A were treated with core stabilization exercises along with conventional physical therapy (i.e., SWD, ultrasound, TENS, isometric exercises) while patients in group – B were treated with conventional treatment methods alone. The patients were treated thrice a week for 30 minutes in each session. The outcome measures were pain and physical functional outcomes. Pain was measured by using Visual Analogue Scale which ranges between 0 – 10 in which 0 indicates mild or low pain while 10 indicates severe pain. Physical functional outcomes of patients were measured by using Modified Oswestery Disability Questionnaire. The result of the scale will be in percentage, lower percentage showed greater improvement. Pre-treatment and post-treatment (at end of 2nd month) values of VAS and MODQ of both groups were compared. The materials used in research were treatment table, Modified Oswestery Disability Questionnaire, VAS, data collection sheet and consent form.

Pre-treatment and post-treatment values of pain and MODQ scales were measured for 4 months and then comparison of values within the group and between the groups were made to see the effects of applied interventions and the results were analyzed in terms of decrease in pain which was shown by VAS and the improvement in functional outcome measure was shown by MODQ.

Statistical Analysis: It was done by using statistics software SPSS 16 and the p-value set as 0.05, p-value less than 0.05 ($p < 0.05$) was considered significant. The quantitative data had been presented in the form of frequency tables, mean and standard deviation. The qualitative data has been presented in form of frequencies. Paired t-test was used to observe the effects of two interventions. Repeated measure ANOVA has been used to compare the interventions between the two groups. Computer software used was windows 7.

Results

The results showed that among 40 subjects, 67.5% ($n = 27$) were males and 32.5% ($n = 13$) were females. About 55% ($n = 22$) of the patients had gradual onset of symptoms and 45% ($n = 18$) had sudden. Among them, 35% (14) patients showed obvious radiological findings and had some underlying pathology. Right side of back is more involved than left in 62.5% patients ($n = 25$).

In group – A, mean value of VAS (pre-treatment) was 7.3 ± 1.2 while VAS (post-treatment) was 3.3 ± 1.3 and of MODQ (pre-treatment) was 66.5 ± 12.3 and (post-treatment) 46.7 ± 8.8 . The p-values for both VAS and MODQ were statistically significant ($p = 0.00$, $p = 0.00$ respectively).

In group – B, mean value of VAS (pre treatment) was 7.4 ± 1.04 and VAS (post-treatment) 3.7 ± 1.09 . Similarly, the mean value of MODQ (pre-treatment) was 70 ± 10 and MODQ (post treatment) 45 ± 9.2 . In this group, p-values for VAS, MODQ were statistically significant ($p = 0.00$, $p = 0.00$ respectively).

With the application of repeated measure ANOVA, p-values obtained for VAS was 0.09 while for MODQ it was 0.018 as both the values proved to be statistically insignificant.

Discussion

Lower back pain (LBP) has adverse effects on human health that makes it a serious problem affecting most individuals. LBP is an extremely common problem with about 85% of population suffering from LBP at some point in their lives with about half of the population having bad back pain.¹⁰ The aim of study is to compare the effects of core stabilization exercises with and without conventional treatment methods used for the treatment of non-specific backache and the results

obtained showed that the combination of interventions i.e. core stabilization along with conventional physiotherapy treatment proved to be as effective in decreasing pain and improving functional status of patient as conventional method alone. In this study population, males (67.5%) were more prone to develop LBP. Symptoms developed gradually in most of the patients

involved (55%). About 35% patients showed some radiological changes associated with backache and 62.5% had involvement of right side of back.

According to a study conducted by Van Tulder, it was observed that medications like NSAIDs⁶ and analgesic reduces the backache in patients; also there is a

Table 1: Paired t-test for group A (n = 20) given core stabilization exercises and conventional therapy.

VAS = Visual analogue scale, MODQ = Modified Oswestery Disability questionnaire, *p-value <0.05 is considered significant

	Variables	Mean	Std. Deviation	T	p-value
Pair 1	VAS (pre) VAS (post)	3.99444	1.57871	10.735	.000
Pair 2	MODQ (pre) MODQ (post)	19.77778	18.11257	4.633	.000

Table 2: Paired t-test for group B (n = 20) given core stabilization exercises alone.

VAS= Visual analogue scale, MODQ= Modified Oswestery Disability questionnaire, *p-value <0.05 is considered significant

	Variables	Mean	Std. Deviation	t	p-value
Pair 1	VAS (pre) VAS (post)	3.65000	1.35180	11.456	.000
Pair 2	MoDQ (pre) MoDQ (post)	24.88889	14.54765	7.259	.000

role of muscle relaxant⁷ in reducing pain and stiffness. Some studies showed that use of modalities i.e. TENS ultrasound, SWD have some effect in reducing pain and improving functional activities of the patients with LBP.¹¹

A recent study conducted by Rubinstein SM, et al observed that although spinal manipulation is a safe and conservative method for treating back pain but does not have a significant role in reducing pain and improving disability.¹²

A study by John Wiley on the benefits of exercise therapy showed that exercise therapy is somewhat effective in reducing pain in patients with chronic LBP.¹³ Our study emphasize the use of core stabilization exercises along with conventional physiotherapy as they showed significant changes in pain level and functional status, thus showed improvement in quality of life.

In a study conducted by Ferreira, it was observed that core stabilization also has good outcomes as compared to no treatment, or the conventional treatment used.¹⁴ There is limited data available regarding core stabilization exercises along with conventional methods used for the treatment of LBP. Studies have shown the effectiveness of both techniques individually. There is no comparative study showing the effectiveness of combined techniques.

This study proved the effectiveness of both the techniques applied to the patients as they improved pain level and functional status of them, both the methods including core stabilization exercises and conventional physiotherapy methods are effective in reducing pain and gaining functional activities, as the p-values were found to be statistically significant ($p = 0.000$ for VAS, $p = 0.000$ for MODQ).

Conclusions

Core stabilization exercises are better in decreasing pain and improving functional status of patients along with conventional treatment methods in patients with non-specific LBP. Any of the combination i.e., core stabilization exercises along with conventional methods or conventional method alone can be used to gain better results and functional outcomes in treating LBP. Both interventional methods are equally effective in reducing backache as there is no significant difference among the groups. Further studies should be done on

this topic to test the effectiveness of these treatment methods at national level.

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