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Original research article

To evaluate the efficacy of physiotherapy correction techniques in patients with chronic low back pain

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Abstract
Background: Low-back pain (LBP) is one of the most common musculoskeletal problems; it is the leading cause of disability worldwide. Physiotherapy exercise is a method that enables health care professionals to pass on their knowledge and experience to patients so that they can participate consciously and actively in their recovery.
Aim: The present study aims to examine the effect of physiotherapy on LBP.
Materials and Methods: This retrospective study was carried out in the Department of Physiotherapy in a tertiary care hospital, India. A total of 50 patients of age range 18 to 60 years with chronic low back pain were enrolled in the present study. Pre and post physiotherapy effect on low back pain and trunk flexion was evaluated and compared.
Results: The majority of the patients 44% were 46-60 years age group, mean age ± SD was 48.6 ± 9.17 years. Slight male predominance (52%) was found. The mean ± SD, BMI was 29.4 ± 5.0 and was mean ± SD duration of LBP (months) was 17.4 ± 2.2 was patients. Significant improvement of VAS score (pain) and trunk flexion movement was seen in post treatment group.
Conclusion: Multidisciplinary approaches including physical therapy should be implemented to provide long-term improvement in pain and functional status in the treatment of chronic LBP.
Keywords: Non-specific chronic low back pain, physiotherapy, pain, trunk flexion

Introduction

Chronic low back pain (CLBP) is defined as a pain that persists for more than 3 months, or longer than the expected healing period; it represents one of the most common and costly musculoskeletal problems in modern society [1]. Low back pain (LBP) has become an increasing problem around the world. It is increasing as a result of an ageing and expanding world population [2]. The years lived with disability from low back pain have gone up by more than 50% since 1990, particularly in low-income and middle-income countries. In general, it is related to smoking, obesity, sedentary occupations, and to low socioeconomic status (with poor quality of life and limited resources). In low-income and middle-income countries, disability and costs from low back pain will rise in the future, especially where health systems are delicate and cannot cope with this increasing burden [3-4]. In 85% of patients with low back pain, the symptoms and signs are non-specific without a clear diagnosis, prognosis, or treatment protocol [5]. LBP has negative impact on functional, socioeconomic, and occupational activities and on the psychological status. Due to the multiple negative effects associated with CLBP, it has been argued that a single technique for low back pain treatment would be ineffective and treatment should include a multidisciplinary approach [6-7]. A variety of conservative treatment modalities, such as exercise, physical therapy, and medication are applied in the treatment of CLBP. These techniques are intended to increase mobilization, decrease pain, and improve functional and psychological status [8-9]. There are several factors inflicting mechanical low back pain, like excessive masses to normal spinal structures. The loads transmitted to the spine are affected by posture, body mechanics, trunk strength and also flexibility in addition to strength of the muscles of the pelvic arch and lower extremities [10]. There are many treatment options in chronic LBP including surgical and non-surgical treatment. The conservative approaches include pharmacological and non-pharmacological treatment, often used in combination. Of non-pharmacological type of treatment, the physiotherapy (PT) is an essential part of complex therapy for improving functionality and preventing disability [11-12].

Aim: The present study aims to examine the feasibility and the effects of physiotherapy exercise on non-specific chronic LBP patients.

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Material and Methods

This retrospective study was carried out in the Department of Physiotherapy in a tertiary care hospital, India.

Inclusion criteria

- Patients diagnosed with low back pain.
- Age ranged 18-60 years, both gender.
- Who given written informed consent for the study.

Exclusion criteria

- Spinal pathologies like fractures, tumour, inflammatory pathologies such as ankylosing spondylitis, nerve root compromise (disc herniation and spondylolisthesis with neurological compromise, spinal stenosis etc.).
- Prediagnosed cardio respiratory diseases.
- Red flag sign includes thoracic pain.
- Previous history of carcinoma, steroid injection.
- Previous history of spinal surgery.
- Pregnancy, Rheumatoid arthritis, spinal deformity, degenerative conditions of spine.

Outcome Measure: Modified Oswestry Low back pain questionnaire

The subject sample contained 50 subjects that met the inclusion criteria for the study. The data collected from patient records included; subject characteristics (age, gender, BMI etc.), pain reports, number of treatment visits, and range of motion measurements of trunk flexion, extension, side bending, and straight leg raise. The average number of treatments using BCT (approximately 9) and patients reported an average decrease in pain of 4/10 Trunk flexion, extension, and right and left side bending increased by an average of approximately 23, 19, 12 and 15 degrees, respectively. Straight leg raise measurements increased an average of approximately 15 degrees for both the right and left hips. Analysis of the collected data suggested that BCT can result in increases in trunk and hip range of motion measures and decreases in patient reported pain complaints. Results from the data also suggested that age and sex do not affect a positive outcome from treatment.

Statistical Analysis: Microsoft Excel 2010 was used for analysis of the gathered data. Baseline and demographic data of the groups were analysed using "Independent sample t test". Mean and standard deviation were calculated. The p value <0.05 was considered statistically significant.

Results

A total of 50 patients of 18-60 year age group were enrolled in our study. The majority of the patients 44% were 46-60 years age group, mean age was 48.6 ± 9.17 years. Slight male predominance (52%) was found. The mean BMI was 29.4 ± 5.0 and was mean duration of LBP (months) was 17.4 ± 2.2. Demographic characteristics of subject are shown in Table 1.

Table 1: Socio-demographic characteristics of study subject

Socio-Demographic Data Characteristics	Cases (N=50)	Percentage
Gender		
Male	24	48%
Female	26	52%
Age group		
18-30 years	12	24%
31-45 years	16	32%
46-60 years	22	44%
Age in Years Mean ± SD	48.6 ± 9.17	
Body mass index (Kg/m^2)	29.4 ± 5.0	
Duration of LBP (months)	17.4 ± 2.2	

The VAS scores after the therapy were significantly lower compared to pre-therapy scores and the differences between pre-therapy and at three months post-therapy were found to be significant (p<0.05).

Table 2: Comparison of VAS score (pain) between pre and post physiotherapy treatment

Pretreatment (n=50)	Post treatment (n=50)	Mean difference	Standard error	t-statistic	P value
8.32 ± 1.26	2.28 ± 1.11	-6.040	0.237	-25.434	P<0.0001

Significant improvement of flexion movement was seen after post physiotherapy treatment as compared to pre-treatment.

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Table 3: Comparison of mean trunk flexion between pre and post physiotherapy treatment

Pretreatment (n=50)	Post treatment (n=50)	Mean difference	Standard error	t-statistic	P value
15.62 ± 5.27	29.58 ± 8.08	13.960	1.364	10.233	P<0.0001

Discussion

The main goals of CLBP treatment are to reduce pain, to improve soft tissue flexibility due to spasm and tension, to increase strength and endurance of the trunk stabilizers, and to improve mobility and posture, thereby, leading to improved functional capacity, better ability to perform activities of daily life, and prevention of work loss [13-14]. Many methods such as resting, medical treatment, back school, exercise programs, physical therapy modalities, and manipulation are used in the treatment of CLBP. It has been shown that a multidisciplinary approach is more effective than a single treatment modality [15]. Therefore, a multidisciplinary approach including physical therapy, exercise, and medical treatment was applied in our study.

In our study most of the patients (44%) were 46-60 years of age with mean age of the subjects was 48.6 years, similar finding also reported by Gladwell *et al*., [16], Quinn *et al*., [17] and Wajswelner *et al*., [18], reported mean age were 45.9, 44.1 and 48.9 years respectively.

Slight female predominance was reported in the current study, concordance to Rydeard *et al*., [19] and Da Fonseca *et al*., [20] this may be due to work of the female subjects have more bend from waist then male subjects.

Present study found most of the patients were obese with mean BMI was 29.4 Kg/m^2, accordance with the N Şahin *et al*., [21] and E Alkady *et al*., [22].

Mean duration of LBP was 17.4 months observed in current study, consistent results found by Miyamoto GC *et al*., [23] and Wajswelner *et al*., [18].

In the present study, the VAS score was used to assess the pain severity and used to evaluate the functional status of the patient's pre and post physiotherapy treatment.

We found significantly higher improvements in the VAS scores (reduction of pain) with the physiotherapy treatment at three month and one year of follow-up, compared to medical and exercise therapy alone, our finding were comparable with the many other studies like: E A. Shipton *et al*., [24], Valenza *et al*., [25], Sarkar N, *et al*., [26] and Moseley *et al*., [27]. Increased para spinal and body muscle strength, endurance and increase aerobic capacity may lead to reduced low back pain and improved functional status.

This study disclosed important post-physiotherapy treatment significantly increased (p<0.05), the range of motion of body part in trunk flexion, These findings are in agreement with Hosseinifar and colleagues *et al*., [28], Almushaiqeh NA *et al*., [29] and Van Tulder *et al*., [30].

Improvement in terms of reducing pain and increasing various motions of body part flexion in patients with chronic low back pain are significantly higher in physiotherapy treatment as compared to the patients who received no treatment or other conservative treatments

Conclusion

We found that the combination of physiotherapy methods, exercise, and medical treatment for non-specific CLBP is better improved pain and functional status of the patients, than exercise and medical treatment without physical therapy. Therefore, a multidisciplinary approach including physical therapy, exercise and medical treatment was applied for treatment of LBP.

Conflicts of interest: None.

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