Original Article

COMPARISON BETWEEN SLUMP STRETCHING ALONG WITH EXERCISES AND COGNITIVE INTERVENTION WITH EXERCISES IN THE MANAGEMENT OF NON-RADICULAR LOW BACK PAIN

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ABSTRACT

Background: Low back pain is one of the most frequent health related complaints world wide. 80% of all human beings experience LBP has had at least 1 episode of LBP in their lifetime. To date, the effect of slump stretching & exercises versus cognitive & exercises has not been compared in non radicular low back pain in a randomized experimental clinical trial.

Study design: A randomized experimental clinical trial.

Objective: To find out & compare the effect of slump stretching with exercises and cognitive intervention i.e. ergonomic advices with exercises in non radicular low back pain.

Methods: 40 consecutive patients were randomly allocated into two groups with mean age (18-70) year, chief complaint of non radicular LBP. 14 male and 6 female patients were taken in each group. Patient were treated twice weekly for 3 weeks for a total of 6 visits. All patients were referred to physical therapy by orthopedician. This study was done to measure pre and post effect of slump stretching along with exercises versus cognitive therapy with exercises using NPRS for pain, MODI, FABQ & Body diagram for Centralization of pain in the management of non radicular low back pain.

Data Analysis: Sample size calculations were performed using SAS statistical software. To calculate the result related t- test was used. There was significant difference is observed in the mean value and pd" 0.0001.

Results: After 3 weeks for a total of 6 visits of treatment there was significant improvement in disability, decrease in pain and centralization of symptoms by using slump stretching compared to treatment of cognitive intervention.

Conclusion: The present study concluded that slump stretching is beneficial for improving disability, decreasing pain, and centralization of symptoms compared to treatment of cognitive intervention. But the role of cognitive intervention also important in LBP specially to prevent the disability and fear factor by changing the life style.

KEYWORDS: Low Back Pain (LBP), Numeric Pain Rating Scale (NPRS), Modified Oswestry Disability Index (MODI), Fear-Avoidance Beliefs Questionnaire (FABQ).

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Access this Article online

Quick Response code

International Journal of Physiotherapy and Research
ISSN 2321- 1822
www.ijmhr.org/ijpr.html

Received: 29-01-2014 Accepted: 17-02-2014
Peer Review: 29-01-2014 Published: 11-04-2014

INTRODUCTION

Low back pain is one of the most frequent health related complaints worldwide. Previous studies have indicated low back pain exists in every culture and country. Estimates by numerous investigators indicate that at some point in their lives, 80% of all human beings experience LBP has had at least 1 episode of LBP in their lifetime. Despite its detrimental association with social and work related activities, the exact

cause of mechanical LBP has not yet been determined [1]. Several factors, based on assumptions, clinical findings, and scientific experiments, have been associated with the development of LBP. Many patients have self-limited episodes of acute low back pain and do not seek medical care [2]. Among those who do seek medical care, pain, disability, and return to work typically improve rapidly in the first month [3]. The point prevalence of back pain is 7-14%, one year prevalence is 36-37% & life time prevalence is 58% [2,4]. Back pain frequently reoccurs. It is equally prevalent in both sexes although its clinical course may be different; disc disease being more prevalent in men who have more surgery [2,5]. Whilst in women it may be more likely to linger into chronicity. Pregnancy, abortions and parity are associated. Other risk factors include smoking (which may be linked with atherosclerosis of the abdominal aorta road traffic accidents and falls. Individual factors are genetic predisposition, age, gender, height, weight, obesity, smoking & posture all factors affect of the spine.[6]

So Disability associated with low back pain continues to rise, contributing to a substantial economic burden that exceeds nearly 50 billion annually in the United States alone [6, 7, 8]. Since Maitland (1985) described the slump test it has been used as an assessment tool for the identification of possible altered neurodynamics & more recently has been suggested as a possible treatment technique (Butler, 2000). [9] Exercises are recognized as one of the optimal management for low back pain. Based on various exercises approaches, scientific evidence to justify the exercises efficacy is limited [9, 10]. Since 1990 many randomized control trial studies have been published & provide highly scientific evidence demonstrating the effectiveness of exercises in low back pain [11]. Waddell G et al 1998 suggests that the sub-acute phase is the phase where treatment is likely to be most effective. In this phase, psychosocial factors such as attitudes, beliefs, mood state, social- and work-related factors, disability, compensation and time off work, often termed “yellow flags”, seem to be of importance for developing chronicity. [12]

According to Woodhall & Hayes (1950), was the first to employ knee extension in sitting as a tension test. In 1942, Cyrix used combinations of knee extension in sitting with cervical flexion to diagnosis sciatica perineuritis. Inman & Saunders 1942 also suggested using combination of spinal flexion & SLR to try and localize the source of lumbar pain. The slump test has been proposed as a test of adverse mechanical tension in the lower quarter (Maitland GD et al 1985) [9,10]. It has been theorized that adverse mechanical tension in the nervous system can generate pain when decreased neural mobility occurs with movement [13, 20].

Exercises regimen: Patients also completed a standardized exercise program consisting of pelvic tilts, bridging, wall squats, quadruped alternate arms/legs activities as described by Childs et al. (2004), which has been shown to result in clinically meaningful improvements in disability. Patients were asked to perform 2 sets of 10 repetitions of each exercise. Based on the concept that specific muscles are able to stabilize the lumbar spine. [2, 14, 15, 16]

Cognitive intervention (Ergonomic intervention): Ergonomic & personal risk factors result in LBP, but psychosocial factors can influence LBP disability. Epidemiologic studies clearly indicate the role of mechanical loads on the etiology of occupational LBP. Occupational exposures such as lifting, particularly in awkward postures; heavy lifting; or repetitive lifting are related to LBP. Any prolonged posture will lead to static loading of the soft tissues and cause discomfort. Standing & sitting have specific advantages & disadvantages for mobility, exertion of force, energy consumption, circulatory demands, coordination, and motion control. The seated posture leads to inactivity causing an accumulation of metabolites, accelerating disk degeneration and leading to disk herniation. Prevention is by far the treatment of choice. Fixed postures should be avoided. Seats offering good lumbar support should be used in the office. [17, 18, 20]

MATERIALS AND METHODS

Present study was a randomized experimental clinical trial. The samples were selected from a leading orthopedic hospital in Hisar, India. 40 Consecutive patients were randomly allocated into two groups with mean age (18-70) years chief complaint was non radicular LBP.

28 Male and 12 female patients were taken in this study. Both these groups contain 14 male & 6 female patients respectively. This study was done to measure pre and post effect of slump stretching along with exercises versus exercises with cognitive therapy using NPRS for pain, MODI, FABQ & Body diagram for Centralization of pain in the management of non radicular low back pain. The inclusion criteria for the study were non radicular LBP. Patients had symptoms that referred distal to the buttocks with slump testing & a base line Oswestry score greater then 10% were also included. Patients with serious spinal condition (e.g. infection, tumor, osteoporosis, spinal #), Pregnant woman, have history of spinal surgery, positive neurological sign or symptoms of nerve root involvement, neurological disorder, degenerative joint disease & muscular dystrophy all were excluded.

Dependent variables were Pain, Disability, and Fear-Avoidance.

Independent variables were slump stretching, Ergonomic advices, Exercises: Bridging, Quadruped, Pelvic tilt, Wall squats.

Outcome measures were readings of pain, disability, fear avoidance & centralization of pain. The following instruments were used wooden couch, stop watch, Hand outs for ergonomic advice, NPRS for pain, MODI for disability.

PROCEDURE

After fulfilling the selection criteria, two groups were taken- Group A and group B. In each group 20 subjects were randomly taken. In group A slump stretching & exercises were given and in group B cognitive intervention & exercises were given. All the eligible patients were explained about the study and requested to sign a consent form seeking their willingness to participate in the study. Before intervention pre readings were collected and after intervention post readings were collected in both the groups. Whole study protocol was approved by Departmental ethical committee. Each group got intervention for twice a week for three weeks. Before data collection detailed history & examination of the patients were taken and all the patients fulfilled the inclusion criteria. There was no sample loss during the study.

PROTOCOL

Slump stretching: The slump testing sequence as described by G.D Maitland (1985). Slump stretching was performed with the patient in the long sitting position with the patient's feet against the wall to assure that the ankle remained in 0 degree of dorsi-flexion. Then over pressure applied into cervical spine flexion to the point where the patient's symptoms are reproduced. The position is held for 30 sec & then rest is given for 20 sec. A total of 5 repetitions are completed. The time spent to perform the slump stretching added only 3–4 min to the total treatment time. All patients were treated in physical therapy twice weekly for 3 weeks for a total of 6 visits.

Exercises: Each Patient completed a standardized exercise program consisting of bridging, pelvic tilts, quadruped with alternate arm & leg raise; wall squats as described by Childs et al. (2004). Each patient performed 2 sets of 10 repetitions with five minute rest interval between the sets. Each subject instructed to wear comfortable clothing during exercises. Subjects performed first three exercises on a standardized height couch. The fourth exercise i.e. wall squat performed with standing & back supported on wall and feet were normal width apart.

Cognitive intervention

In group B hand outs of ergonomic advices and verbally explanation of the following ergonomic advices. The pain mechanism explained individually to the subjects. Functionally examine the individual problems, feedback and advice. Instruct all individual's how to do proper exercises. How to use their body actively advised to patients in functional and demanding tasks (such as sitting, standing etc.) of daily life. Instruct the squat technique when lifting is required. Explanation given to individual's to cope up with new attacks of back pain. Reassure and emphasize that it is safe to move and to use the back without restriction. Avoid heavy weight lifting & jerky movements. Also explain prolong sustained posture should be avoided.

RESULT & DATA ANALYSIS

Sample size calculations were performed using SAS statistical software. In present study sample size of 20 subjects each group provides greater than 80% power to detect both statistically significant and clinically meaningful differences between the groups. To calculate the result

related t-test was used.

Table 1: Represent difference of pre & post scores change in group A & B variables.

Variables	GROUP	MEAN	SD	t-value	p-value
NPRS	A	6.9	0.967	31.88	0.0001
	B	4.25	1.409	13.48	
MODI	A	29.3	5.704	22.97	0.0001
	B	9.5	7.251	5.85	
FABQ	A	32.05	7.521	19.05	0.0001
	B	8.05	6.073	5.927	
COP	A	3.6	1.957	8.224	0.0001
	B	3.1	1.97	7.034	

SD: Standard Deviation, COP: Centralization of Pain

There is statistically significant difference in group A i.e. slump stretching& and exercises and group B i.e. cognitive intervention & exercises. So mean value of group A is greater than group B. pd" 0.0001.

Fig. 1: Represent variables of group A.

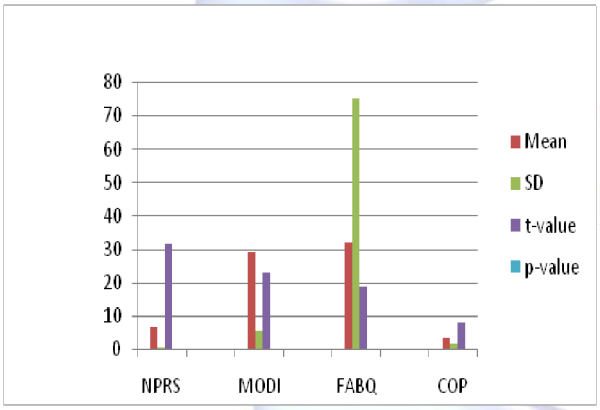
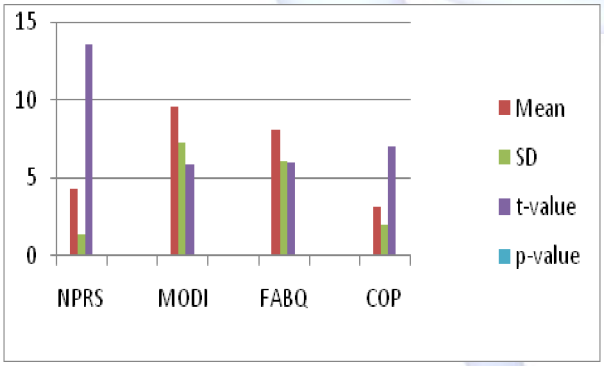


Fig. 2: Represent variables of group B.



DISCUSSION

To our knowledge, this is the first randomized controlled trial comparing slump stretching with exercises and cognitive intervention along with exercises in non radicular low back pain. In the past two different studies was done i.e. first on The Slump Stretching in the Management of Non-Radicular Low Back Pain: A Pilot Clinical Trial Done by Joshua A. Cleland et al 2006[10]. The other study was Intensive Group Training Versus Cognitive Intervention: In Sub-Acute Low Back Pain Short-Term Results of a Single Blind Randomized Controlled Trial by Kjersti Storheim in 2003[14]. But both studies have some limitation & to furtherelaborate these studies limitations has been overcome. In the present study there was significant reduction in pain, disability, fear and in centralization of pain in both the groups i.e. in "Yellow-flag"-variables were significantly reduced when two groups were compared, group A was found to have more benefit. It has been reported that reductions in the Oswestry of 6 points or greater are considered clinically meaningful (Fritz and Irrgang, 2001)[8]. In present study all patients were treated in physical therapy twice weekly for 3 weeks for a total of 6 visits. In group A 5 repetitions of slump stretching was given for 30 sec and 20 sec rest. In group B hand outs and verbally elaborates the ergonomic advice. In both the groups exercises were given in 2 sets with 10 repetitions. After this protocol the main findings are that slump stretching with exercises has more effects on pain, disability, fear and centralization of pain. These findings are consistent with the findings of Joshua A [9]. Cleland et al 2006 that have explored the impact of slump stretching on non radicular low back pain. The change scores for both groups in present study surpassed clinically meaningful level.

The slump test is used clinically to investigate the presence of altered neurodynamics there is currently a lack of evidence suggesting that any particular neurodynamics treatment technique results in changes of the mechanical or physiological function of nerve tissues. Determining the mechanism for why patients receiving slump stretching improved to a greater extent is beyond the scope of this study. Perhaps the slump stretching was effective in reducing the patient's pain by dispersing intraneural edema, thus restoring pressure gradients, relieving hypoxia and reducing associated symptoms (Cowell & Phillips 2002). Slump stretching may also have resulted in improved outcomes by reducing antidromic impulses generated in C-fibers at the dysfunctional site which result in the release of neuropeptides and subsequent inflammation in the tissues supplied by the nerve (Shack lock, 1995). Hence if normal neurodynamics are restored by

alleviating any sites of neural compression, excessive friction or tension, antidromically evoked impulses may perhaps be eliminated. It is also possible that slump stretching may have resultedin a reduction of scar tissue, which had adhered to neural tissue and its associated connective tissue structures (Turl and George, 1998). Although preliminary evidence exists in support of the validity of the slump test in identifying neural tissue involvement (Coppieters et al. 2005), the possibility that the source of pain was derived from structures other than the neural tissues cannot be eliminated. It was also observed that once the pain occurred the patient became self sensitive for doing ADL's. So, he already started to follow all the ergonomic advices but due to the fear of pain & he could not do any physical activity and work. Once pain intensity subsides, which is more reduces in group A the fear of doing activity reduces gradually. Due to less decrease in pain intensity in group B there were chances of less decrease in disability and fear. Robert N. Jamison investigated that the influence of physical and psychosocial factors on accuracy of memory for pain in chronic pain patients. They found that most patients tended to overestimate their pain intensity levels.

CONCLUSION

The present study concluded that slump stretching is beneficial for improving disability, decreasing pain, and centralization of symptoms compared to treatment of cognitive intervention. But the role of cognitive intervention also important in LBP specially to prevent the disability and fear factor by changing the life style.

Limitation of the Study

Patients excluded with a SLR positive, thus potentially excluding patients with more severe neural mechanosensitivity, thus the results may not be generalizable to this patient population. Exercise & slump stretching not gave for home.

Acknowledgement

Authors expressing their sincere gratitude and moral obligation to Mr. Surender Thakral, Dr. Naveen, Dr.Manjeet & Dr.Rajkumar for their assistance with research procedures& support during the study in Hisar, Haryana, India.

Conflicts of interest: None

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How to cite this article:

Yadav Ravinder, Arora Ashok, Vandana.COMPARISON BETWEEN SLUMP STRETCHING ALONG WITH EXERCISES AND COGNITIVE INTERVENTION WITH EXERCISES IN THE MANAGEMENT OF NON-RADICULAR LOW BACK PAIN. Int J Physiother Res 2014;2(2):429-34.