

Comparative Efficacy of Selected Physiotherapy Treatment and Yogic Asanas on Low Back Pain among Male Physical Education Students

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Abstract

Low back pain is very common among general population and sportspersons. The structure of lumbosacral spine is such that predisposes it to mechanical injury. The sportspersons, in particular are subjected to repetitive bending, twisting or compressive stresses to the spine causing low back pain. Purpose of the present study was to see the comparative efficacy of selected physiotherapy treatment and yogic asanas on low back pain among male physical education students. Thirty male students having low back pain were randomly selected and divided into two equal groups; Experimental Group I and Experimental Group II. Experimental Group I was given Physiotherapy treatment, which included Pulsed Short Wave Diathermy and selected flexion and extension regimes of therapeutic exercises for three weeks. Experimental Group II received hot fomentation followed by selected Yogic asanas namely, Bhujangasana, Dhanurasana, Pavanmuktasana, Paschimottasana and Shavasana. The statistical analysis was done to see the significance of difference between the treatments. For this purpose 't' ratio was applied at 0.05 level of significance. Data analysis revealed that in both Experimental Groups I and II, low back pain reduced significantly. However, no significant difference was found between the groups (i.e., physiotherapy treatment and yogic asanas).

Key Words: Physiotherapy, Yogic asanas, Pulsed Short Wave Diathermy, Low Back Pain

Introduction

Low back pain is so common that according to an estimate about 60-80% of the people experience low back pain sometime during their lifetime. The structure of lumbosacral spine is such that predisposes it to mechanical injury causing low back pain. Any movement or series of movements, which places abnormal stress or abnormal loading on the spine, can injure it. This may be a sudden overload or a cumulative overload. Various studies have confirmed that lower back problems are second only to foot problems in order of incidence to humans throughout their lives. It is a common complaint among the overall population and athletes. Low back pain is

more common among the sportsmen as they are subjected to repetitive bending, twisting or compressive loading stresses to the spine. In athletes, reported incidence rates of lumbar pain vary between 7% and 27% (*Spencer & Jackson, 1983 and Varlotta & Birnbaum, 1995*).

Although low back pain is very common, however the exact cause of low back pain cannot be identified in 80% to 90% of the patients. An exact diagnosis cannot be made due to a loose association among symptoms, physical examination and anatomical findings. Low back pain is most often due to an incompetence of the soft tissue structure, and the onset of pain is believed to be caused by a mechanical

injury (Mooney, 1996). Several factors may contribute to low back pain including muscular deficiencies (specifically insufficient abdominal strength and trunk flexibility) and incorrect posture and body mechanics. McKenzie classified back pain as of two types i.e. mechanical or chemical (non-mechanical) in origin. Mechanical pain is produced by deformation of structures containing nociceptive nerve endings, and there is a clear correlation between certain body positions and patient's symptoms. Conversely, non-mechanical pain is of a constant nature. This may be exacerbated by movement or position, but importantly, no position will be found which completely relieves the symptoms (Norris, 1993). The non mechanical category may include inflammatory, infective, vascular, visceral, metabolic, psychologic or other conditions that may produce low back pain.

There are various types of healing therapies, and each one claims to give best results in the low back pain. Physiotherapy treatment and Yogic asanas are both excellent means of promoting flexibility to the joints and soft-tissues. They also help improve muscular strength, endurance, controlled muscular actions and relaxation.

The important role that physiotherapy and remedial exercises have on improving or restoring muscle-strengths, flexibility and body mechanics in preventing or remediating back problems have been well documented by many including Melleby (1982), Getchel (1983) and Liemohn (1988). Jasmine & Mhatre (2006) in a study conducted on 20 patients suffering from mechanical low back pain showed that the group of the patients that received training of core

stabilizer muscles improved significantly in pain relief and functional ability. Shah and Gohel (1989) conducted a study on 100 patients with low back pain having age 31-50 years and the patients were treated with various modalities like Short Wave Diathermy, flexion exercises/extension exercises alone, or in combination, and found that the maximum number of patients got relief by a combination of Short Wave Diathermy and flexion exercises.

Signifying the yoga as a great source of health and fitness, Dr. Salk, Noble Prize Winner rightly said, "Medicine is Science of disease and Yoga is the Science of health". Asanas forms only one of the basic components of complete astanga yoga. Each asana is a series of scientifically developed slow, rhythmic and graceful movements of various joints and muscles of the body aimed at attaining a definite posture as related to that particular asanas. Various studies have confirmed the usefulness of yogic asanas in preventing as well as curing many ailments and diseases. With reference to the positive effects of yogic asanas in back related problems, few studies are cited here. Many researchers have shown that with yogasanas like Konasana, Suptavajrasana, Bhujangasana, Shalabhasana and Chakrasana, favourable response was shown in patients suffering from low back pain with improved functional capacity. Jothiwaran (1998) indicated a significant change in the postural deviations of spinal column due to influence of yoga and remedial exercises. Thirumalaisamy (1996) found that low back pain may be subsided by means of selected yogic practices.

Purpose of present study was to see the comparative effect of selected

Physiotherapy treatment and Yogic asanas on low back pain among male physical education students.

Material and Methods

Thirty male physical education students, aged 17-24 years studying at Lakshmi Bai National Institute of Physical Education, Gwalior were randomly selected for the study during 2001-2003. These subjects having complaint of low back pain reported to Physiotherapy centre of the Institute for treatment. The subjects were divided into two equal groups; Experimental Group I and Experimental Group II. Experimental Group-I was given Physiotherapy treatment which included Pulsed Short Wave Diathermy application for 10 minutes and Flexion and Extension regimes of spinal exercises. Experimental Group-II received hot fomentation for 10 minutes to low back region followed by selected yogic asanas namely Bhujangasana, Dhanurasana, Pavanmuktasana, Paschimottanasana, and Shavasana. Both groups received treatment for three weeks (5 days a week). Short Wave Diathermy model Thermatur-200 manufactured by Uniphy, Netherlands was used with drum shaped treatment head (14cm diameter) for the study. Flexion regime of exercises included posterior pelvic tilt, Knees to the chest, and sit up straight and obliquely from supine crook lying position. Extension regime of exercises included the prone press up with hands clasped behind the back, and alternate leg extension from prone position.

The selected yogic asanas were done empty stomach (under the supervision of a qualified yoga expert). Duration of holding the asanas was

gradually increased as per the tolerance of each subject.

Low back pain was assessed before and after the treatment and scoring was done with a five point ordinal scale by the interview technique. As per table-1, according to the degree of pain subjects were given points and the score was made before the treatment started, and after the treatment of three weeks.

Table-1 Five Point Ordinal Scale

Pain Level	Points
No pain	1
Mild pain	2
Moderate pain	3
Severe pain	4
Excruciate pain	5

The data from both the groups were statistically analysed for before the treatment and three weeks after the treatment and to see the significance of difference between the paired means, t-ratio was applied and the level of significance set at 0.05 level of confidence.

Results & Discussion

Findings of the present study are shown in Tables 2-5.

Table 2: Significance of difference between Pre means of Experimental Group-I and Experimental Group II.

Group	Pre-Mean	S.D.	D.M.	σD.M.	't' Ratio
Experimental Group I	3.00	0.76			
			0.13	0.255	0.51
Experimental Group II	3.13	0.64			

t_{0.05} (28) = 2.05

Difference in the Pre-Means of Experimental Group I and Experimental Group II is statistically insignificant (t=2.05). Therefore, there is no difference

between the Experimental Group I and Group II prior to the treatment.

Table 3: Significance of difference between the Pre and Post Means of Experimental Group-I (Physiotherapy treatment).

Experimental Group I	Mean	S.D.	D.M.	σD.M.	‘t’ Ratio
Pre-Treatment	3.00	0.756			
			1.60	0.2345	6.82*
Post-Treatment	1.40	0.507			

* significant, $t_{0.05}(28) = 2.05$

Finding of table-3 shows that there is significance of difference between the Pre and Post Means of Experimental Group I. Since the obtained value of ‘t’ (6.82) is much greater than the required value (2.05) at 0.05 level of significance with 28 degrees of freedom, therefore, it can be concluded that Physiotherapy treatment comprising of Pulsed Short Wave Diathermy and Exercises for a duration of three weeks (five days a week) relieves the low back pain significantly.

Table 4: Significance of difference between the Pre and Post Means of Experimental Group II (Yogic asanas).

Experimental Group II	Mean	S.D.	D.M.	σD.M.	‘t’ Ratio
Pre-Treatment	3.13	0.640			
			1.53	0.2317	6.60*
Post-Treatment	1.60	0.632			

* significant, $t_{0.05}(28) = 2.05$

Finding of table-4 reveals that there is significance of difference between the Pre and Post Means of Experimental Group II. Since the obtained value of ‘t’ (6.60) is much greater than the required value (2.05) at 0.05 level of significance with 28 degrees of freedom, therefore, it can be concluded that the yogic treatment consisting of heat and yogic asanas for a duration of three weeks (five days a week) relieves low back pain significantly.

Table 5: Significance of difference between Post Means of Experimental Group-I and Experimental Group II.

Group	Post-Mean	S.D.	D.M.	σD.M.	‘t’ Ratio
Experimental Group I	1.40	0.507			
			0.20	0.209	0.957
Experimental Group II	1.60	0.632			

$t_{0.05}(28) = 2.05$

Finding of table-5 shows that the ‘t’ value between the Post-Means of Experimental Group I and Experimental Group II is (0.957) much less than the required value for significance ($t=2.05$). Therefore, it can be concluded that there is no difference between the Experimental Group I and Group II after treatment.

From the statistical analysis it is revealed that there is significant reduction and relief in low back pain in both the Experimental Group I and Experimental Group II which received Physiotherapy treatment, and Yogic asanas treatment respectively.

The relief of pain in Experimental Group-I could be attributed to the therapeutic effect of Pulsed Short Wave Diathermy because of increased blood circulation, acceleration of healing process, and selection of planned regimes of exercises. The findings of the present study are in consonance with the findings of *Melleby (1982)*, *Getchel (1983)*, and *Jasmine (2006)*. Further, the relief of pain in Experimental Group II may be due to the effect of heat on pain relief as well as the ability of yogic asanas in improving flexibility of joints and muscular strength. Holding of asana for a certain period of time involves static posture, which is very important for efficient conditioning of the body. Findings of the present study are also in consonance with the findings of *Tirumalaisamy (1996)*.

The insignificant difference in the Means of pain score after the treatment between Experimental Group I and Experimental Group II could be attributed to the selected physiotherapy exercises and yogic asanas which resemble more or less the similar body postures. Both the groups involved one or the other kind of heat application, and this also could relieve the low back pain. In Experimental Group-I the use of PSWD might have produced additional benefit of placebo effect. However, the shavasana used in Experimental Group II might have derived additional therapeutic effect in pain relief. Hence, no significant difference was found between both the groups in the present study.

Conclusion

In the present study it may be concluded that both the Experimental Groups that received Physiotherapy and Yogic asanas treatment separately, low back pain reduced significantly. Future studies may be conducted with a combined approach of Physiotherapy and Yogic practices. General population as well as the sports persons must be educated for correct body mechanics and

posture at work, study, play field or while sleeping so that the low back pain can be prevented.

References

- Getchel, B. 1983. *Physical Fitness. A way of life.* 2nd ed. John Wiley & Son, New york.
- Jothihran, J. 1988. *Effect of yoga and remedial exercises on Postural deformities.* M.Phil Dissertation, Alagappa University, Karaikudi.
- Jasmine, H.M., Mhatre, B. 2006. Effects of Training core stabilizers in patients with Low back pain. Paper presented in 44th Annual Conference of Indian Association of Physiotherapists, Ahmedabad. Abstract published in Souvenir, p 68.
- Liemohn, W.P. et al. 1988. Unresolved Controversies in Back-Management - A Review. *Journal of Orthopaedic and Sports Physical Therapy*, **9(7)**: 239-244.
- Melleby, A. 1982. *The 8 ways to Healthy Back.* Piscataway. New Century. NJ
- Mooney, V. 1996. Evaluation and Treatment of Low Back Pain. *Clinical Symposia (Ciba)* **48(4)**: 2.
- Norris, C.M. 1993. *Sports Injuries: Diagnosis and Management for Physiotherapists.* Butterworth – Heinemann, Oxford
- Spencer, C.W. and Jackson, D.W. 1983. Back injuries in the athlete, *Clin Sports Med.*, 2: 191-215.
- Shah, R. and Gohel, J. 1989. Management and Prevention of Low back pain. *Journal of Indian Association of Physiotherapists.* 23-25.
- Thirumalaisamy, R. 1996. Effect of selected yogic practices on low back pain, Paper presented during National Seminar, Kanyakumari.
- Varlotta, G.P. and Birnbaum, H.P. 1995. Lower back injuries in Sport. *Current Concepts Sports Med.* **5**: 3-8.