Original Article

Effects of lumbar corset on the patients with lumbar spondylosis

Islam MT[1], Shakoor MA[2], Emran MA[3], Islam KMT[4], Nobi MG[5], Elahi F[6], Alam M[7], Shawly MR[8]

Abstract

This experimental study was done in the Department of Physical Medicine and Rehabilitation, Bangabandhu Sheikh Mujib Medical University to find out the effects of lumbar corset on the patients with lumbar spondylosis. Ninety seven patients were selected in the study. Out of them 40(41.24%) were male and 57(58.76%) were female. The male to female ratio was 1:1.42. The mean age was 41.22 ± 8.52 years. The patients were divided into two groups, 50 patients in group A (Treated with NSAID, activities of daily living instructions and lumbar corset) and another 47 patients in group B (Treated with NSAID and activities of daily living instructions only). In both the groups, patients were treated for six weeks and assessed at 7 days interval. Improvement was noticed in both the groups in every visit but there was no difference in improvement between the groups till 4th week of treatment. At the end of treatment group A showed statistically significant difference in overall improvement in comparison to group B. So, from the present study, it may be concluded that lumbar corset is beneficial to the patients with lumbar spondylosis.

Keywords: Lumbar spondylosis, lumbar corset

1. * Dr Mohammad Tariqul Islam, Medical Officer Department of Physical Medicine and Rehabilitation BSMMU, Shahbag, Dhaka, Bangladesh
2. Dr Mohammad Abdus Shakoor, Associate Professor Department of Physical Medicine and Rehabilitation BSMMU, Shahbag, Dhaka, Bangladesh
3. Dr Md Ali Emran, Assistant Professor, Department of Physical Medicine and Rehabilitation, BSMMU, Shahbag, Dhaka, Bangladesh
4. Dr K M Tarikul Islam, Assistant Professor, Department of Neurosurgery, BSMMU, Shahbag, Dhaka, Bangladesh
5. Dr Md Golam Nobi, Medical officer, Department of Physical Medicine and Rehabilitation, BSMMU, Shahbag, Dhaka
6. Dr Fazle Elahi, Assistant professor, Department of Neurosurgery, Dhaka Medical College, Dhaka
7. Dr Mahbub Alam, Medical officer orthopaedics department, BSMMU, Shahbag, Dhaka
8. Dr Mahjabin Rahman Shawly, Medical officer, Department of Physical Medicine and Rehabilitation, BSMMU, Shahbag, Dhaka

** For correspondence*

Introduction

Low back pain is an extremely common complaint responsible for loss of many days from work.[1] Low back pain refers to pain felt in the lumbosacral spinal and paraspinal regions.[2] Low back pain affects the area between the lower rib cage and gluteal folds and often radiates to thigh.[3] Spondylosis refers to degenerative disease (eg. Osteoarthritis) of the intervertebral disc and/or the apophysial (facet) joints. The natural lordotic curvature of the spinal column where maximum range of motion occurs at the C5-C7 and L3-L4 level predispose these segments to accelerated degenerative changes.[4] The most common sites of lumbar spondylosis are the intervertebral discs between L5/S1 and L4/L5.[5] This is an age related phenomenon that occurs in over 80 percent of people who live for more than 50 years and in most cases it is asymptomatic.[6] A study was conducted to find out the patterns of various rheumatic disorders. Data of patients attending the Rheumatology clinic in the Department of Physical Medicine, Institute of Postgraduate Medicine & Research between July 1994 and December 1995 were analyzed. Out of total 4037 patients, 475(11.77%) patients having lumbar spondylosis.[7] Lumbar supports have been widely used for relief of back pain, but there is no documented evidence that they reduce the period of disability.[8] Lumbar back supports may provide benefit to patients suffering chronic Low back pain (LBP) secondary to degenerative processes through several potential but debated mechanisms. Supports are designed to limit spine motion, stabilize the joints, correct deformity and reduce mechanical forces.[9] The most commonly prescribed lumbosacral support is a corset, which is prescribed for the working hours.[10] In a study, out of 19 patients, 9 patients were allocated lumbar corset with support and 10 patients lumbar corset without support. Both groups were of comparable age (47.1 years). However, analysis showed highly significant improvement in the patients with the spinal support but no change in those with the corset without the support.[11] In an updated review, there was moderate evidence that lumbar supports are not more effective than no intervention or training in preventing low-back pain.[12] When the back pain problem becomes chronic or recurrent a lumbosacral brace may be beneficial.[13] Other treatment modalities occasionally used include epidural and facet joint injection, traction and lumbar supports. There is currently no evidence to support these duo to paucity of research work done on lumbar brace/corset.[14]

The present study was done to determine the improvement of symptoms using lumbar support on the patients with lumbar spondylosis.

Methods

This experimental study was done in the department of Physical Medicine and Rehabilitation, BSMMU, Shahbag, Dhaka from January to June in 2008. A total of 125 patients were included in the study, among them 28 patients were excluded leaving 97 patients for the trail. The patients with lumbar spondylosis were selected irrespective of sexes seeking treatment in the department of Physical Medicine and Rehabilitation, BSMMU and also referred from various outpatient departments of BSMMU. The diagnosis of lumbar spondylosis was confirmed by history, clinical examination, laboratory and radiological findings. The patients were selected on the basis of the inclusion and exclusion criteria. Patients with both sexes, aged between 30 to 70 years and low back pain more than three months were included in this study. Patients with traumatic and acute low back pain were excluded from the study. The selected patients were divided randomly into the following two groups by the way of lottery. Group A (case): In this group 50 patients had been treated with lumbar corset, ADL (Activity of daily living) instructions and NSAIDS. Group B (Control): In this group 47 patients had been treated with ADL instructions and NSAIDS only.

Lumbar corset: To support low back region lumbar corset was prescribed in working hours and especially during journey. It was not advised to wear during exercise, sleeping and taking shower. It was given to support the lower back, to improve posture and to minimize movement of lumbar spine.

Measurement of the corset: The patients were instructed to wear lumbar corset according to their waist size. Well fitted and adequate support was ensured. Ideally the corset should extend well down to the symphysis pubis. It should fit firmly and smoothly over the greater trochanters, iliac crests and buttocks. The posterior strips should follow closely the curves of the sacrum and spine. It should not interfere with hip flexion and sitting. It should not ride upwards. It must be comfortable. Some patients who did not wear a corset before found uncomfortable at first. They were advised to gradually lengthen the time of wearing lumbar corset.[15]

Instructions for the patient

The patients were instructed to buckle the fulcrum strap firmly and other abdominal straps or laces must be tightened firmly. It was also instructed to the patients to ease pressure over the costal margin and thighs by slightly loosening the upper and lowermost fastenings.[15] ADL instructions were given to the patients in a printed paper and also described verbally. A pictorial sheet including correct and incorrect posture of sleeping, sitting, weight lifting, carrying in front, carrying in back, driving, loading/unloading, working at a desk(seated) manner were supplied to every patients. Tablet Naproxen 250 mg twice daily after meal and Capsule Omeprazole 20 mg half hour before meal were prescribed both group of patients for six weeks.

Outcome measures: Each group was assessed at every 7 days interval. There were 6 visits and in each visit patients were assessed by the following parameters:

a) Patient's assessments of pain (visual analogue scale)[16]

b) Disability detection

1. Oswestry disability index score[17]
2. Modified Zung index score[18]
3. Modified Schober's test (cm)[1]

Statistical analysis: The data were compiled and coded properly. The numerical data were analyzed statistically by using statistical package for social science (SPSS-12). The results were expressed as percentage and mean ± SD and p value < 0.05 was considered as significant. Students 't' test and Chi-square test were done to see the level of significance as required.

Results

Out of 125 patients, 97 patients with lumbar spondylosis were ultimately included in the study group, because 28 patients were dropped out. Fifty seven among them were female and forty were male. Female to male ratio was 1.42 : 1. Percentage of female and male were 58.76 and 41.24 respectively. Sex distribution of these patients are shown in (Figure-1).

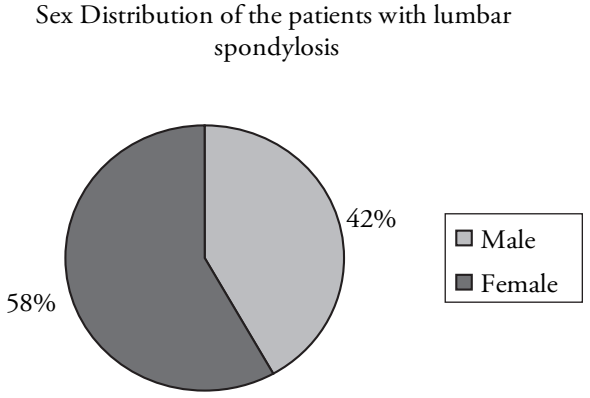

Figure-1: *Sex distribution of patients (n=97)*

All the cases were managed as out patients. The age range of the patients in the study varied from 30 to 70 years. The mean age of the patients of both sexes was 41.22 ± 8.52 years. Out of 97 patients irrespective of sexes it was observed that most patients 22.68% belonged to age group of 40-44 years (Table-I).

Table-I: Age distribution of patients (n=97)

Age in years	Frequency	Percentage
30-34	19	19.59
35-39	21	21.65
40-44	22	22.68
45-49	17	17.53
50-54	9	9.28
55-59	4	4.12
60-64	3	3.09
65-69	2	2.06
70	0	0
Total	97	100%

Among the patients 52.6% (n= 51) were housewives, followed by 15.5% (n=15) were labourer, 14.4% (n= 14) private service group and 9.3% (n= 9) businessman. There was improvement of symptoms after treatment in Group A. The improvement began to occurred after one week (P = 0.001, 95% CI= 3.41 to 6.089). Improvement was gradually increased and finally there was highly significant improvement at the end of treatment (P = 0.001, 95% CI=18.465 to 22.935, (Table II).

There was improvement of symptoms after treatment in Group B also. The improvement began to occurred after one week (P = 0.001, 95% CI= 1.982 to 4.656). Improvement was gradually increased and finally there was highly significant improvement at the end of treatment (P = 0.001, 95% CI=12.268 to16.668 (Table-III).

Table-II: Treatment response in group A (n=50)

Group	W1	W2	W3	W4	W5	W6
Group A (n=50)	32.68 ±8.37 vs 27.92 ±6.47	32.68 ±8.37 vs 24.94 ±6.07	32.68 ±8.37 vs 22.30 ±6.05	32.68 ±8.37 vs 19.50 ±6.14	32.68 ±8.37 vs 16.06 ±5.37	32.68 ±8.37 vs 11.98 ±4.68
P-value	0.001	0.001	0.001	0.001	0.001	0.001
95% CI	3.41 to 6.089	6.085 to 9.395	8.375 to 12.385	10.919 to 15.441	14.410 to 18.830	18.465 to 22.935

Values were expressed as mean ± standard deviation. W= week. n= number of patients in groups.

Table-III: Treatment response in group B (n=47)

Group	W1	W2	W3	W4	W5	W6
Group B (n=47)	29.77 ±7.59 vs 26.45 ±8.15	29.77 ±7.59 vs 23.36 ±7.82	29.77 ±7.59 vs 21.09 ±7.79	2977 ±7.59 vs 18.81 ±7.24	29.77 ±7.59 vs 16.13 ±7.43	29.77 ±7.59 vs 15.30 ±6.77
P-value	0.001	0.001	0.001	0.001	0.001	0.001
95% CI	1.982 to 4.656	4.822 to 7.986	6.936 to 10.426	8.862 to 13.052	11.392 to 15.885	12.268 to 16.668

Values were expressed as mean ± standard deviation. W= week. n= number of patients in groups.

In comparison between two groups, there was no marked diffrence up to fourth week. But there was significant improvement at the end of treatment in Group A than the Group B (P = 0.006, 95% CI= -5.68 to -0.955) (Table-IV).

Table-IV: Comparative treatment response between Group A (n=50) & B

Group	Wo	W2	W4	W6
Group A (n=50)	32.68 ±8.37	24.94 ±6.07	19.50 ±6.14	11.98 ±4.68
Group B (n=47)	29.77 ±7.59	23.36 ±7.82	18.81 ±7.24	15.30 ±6.77
P-value	0.075	0.272	0.614	0.006
95% CI	-.303 to 6.13	-1.26 to 4.41	-2.02 to 3.40	-5.68 to -.955

Values were expressed as mean ± standard deviation. W= week. n= number of patients in groups.

Discussion

The mean age of the patients in this study was 41.22 ± 8.52 years which is similar to previous study10 where mean of the patients were 46±12.59. The male-female ratio in the present study 1:1.42 which is comparable to other studies.[19] Considering the occupations of the study patients housewives 52.6% were at the top of the list followed by labourer 15.5%, private service 14.4%, businessman 9.3%, govt. service 4.1%, cultivator 2.1%, driver 1%, and retd. serviceman 1% which is comparable to other studies[10] where housewives were 30.53% followed by service holder 24%, businessman 11.58% etc. In the present study most of the patients were from the middle class group (77.3%). In the aggravating factors study, activity 37.1% was top the list and then prolong standing 19.6%. prolong sitting 16.5%. prolong walking 13.4%. leaning forward 9.3% and menstruation 1%. In the relieving factors study rest was 59.8% and lying flat was 40.2%. The most important finding of the current study is the outcome of the patients with lumbar spondylosis. The significant improvement of symptoms within both the groups began to appear at the end first week. The trend of improvement continued through out the whole period of six weeks. There was improvement of symptom after treatment in Group A. That is the patients treated with lumbar corset, ADL instructions and NSAIDS. The improvement began to occur after one week. Improvement was gradually increased and finally there was highly significant improvement at the end of treatment. A.M. Khan found in another study there was good compliance and control of back pain with lumbar corsets.[20] There was improvement of symptom after treatment in Group B. That is the patients treated with ADL instructions and NSAIDS. The improvement began to occur after one week. Improvement was gradually increased up to 6th weeks. In comparison between two groups, there was no marked improvement between groups up to fourth week. But finally there was significant improvement at the end of treatment in Group A than the Group B (P = 0.006). This indicates that the group treated with lumber corset become benefited which correlates with previous study.[21]

From this study it is concluded that lumber support is beneficial to the patients with chronic low back pain though the sample size was small.

References

1. Huntley JS, Reid DM, Simpson AHRW. The musculoskeletal system. In: Douglas G, Nicol F, Robertson C editors. Macleod's clinical Examination.11th ed. Edinburgh: Elsevier; 2005. 301-348 p.
2. Garbois M. Management of chronic low back pain. American Journal of Physical Medicine & Rehabilitation. 2005 March; 84 (suppl):S29-S41.
3. Frymoyer JW. Back pain and sciatica. N E J Med. 1998; 318(5): 291-300.
4. Meehan RT. Nonarticular and Regional Musculoskeletal Disorders: Approach to the patients with Neck and Low back pain. In: West S G editor. Rheumatology Secrets. 2nd ed. Philadelphia: Elsevier; 2002. 421-428 p.
5. Shipley M, Black CM, Denton CP, Compston J and O' Gradaigh D. Rheumatology and Bones disease: Common Regional Musculoskeletal Problem. In: Kumar P, Clark M. editors. Clinical Medicine. 6th ed. Edinburgh: Elsevier; 2005. 535-550 p.
6. Eisenstein S, Tuli S, Govender S. The back. In: Soloomon L, Warwick D, Nayagam S. editors. Apley's System of Orthopaedics and Fractures. 9th ed. An Hachettee UK Company: Hodder Arnold; 2010. 476- 478 p.
7. Alam MN, Haq SA, Moyeenuzzaman M, Samad MA, Choudhury MKQ, Das K K et al. Rheumatological Disorders in IPGMR. Bangladesh J of Medicine. 1996; 7: 1-7.
8. Porter RW. Conservative Management of Lumber Degenerative Disease. In: Findlay G, Owen R. editors. Surgery of the spine. London: Blackwell scientific publications; 1992. 2: 683-694.

9. Middleton K, Fish DE. Lumbar spondylosis: clinical presentation and treatment approaches. Curr Rev Musculoskelet Med. 2009 June; 2(2): 94–104.
10. Rahman S. A study on patients with lumbar spondylosis [Dissertation]. Dhaka: Bangladesh College of Physicians & Surgeons; 1996
11. R Million, Nilsen K H, Jayson M I, Baker R D. Evaluation of low back pain and assessment of lumbar corsets with and without back supports. Ann Rheum Dis 1981; 40; 449-454 doi: 10.1136/ard.40.5.449.
12. Duijvenbode I V, Jellema P, Poppel M V, Tulder MWV. Lumbar supports for prevention and treatment of low back pain. Cochrane Database of Systematic Reviews 2008, Issue 2. [online published 17 Feb 2010). Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001823.pub3/pdf
13. Nakano Kenneth k. Neck and Back pain. In: Sten Jay H. Internal Medicine 4th ed. St. Louis Missouri: Mosby; 1994. p. 1033-1041.
14. Doherty M, Rslston S. H. In: Colledge N.R, Walker B.R, Ralston S.H. editors. Musculoskeletal disorders. Davidson's Principles & Practice of Medicine. 21th ed. Churchill Livingstone: Elsevier; 2010. 1072-1074 p.
15. Stewart John D.M, Hallett Jeffrey P. Spinal orthoses. Traction and Orthopaedic Appliances. 2nd ed. B.I. Churchill Livingstone: New Delhi; 2000.131-141 p.
16. McCormack HM, Horne DJ, Sheather S. Clinical applications of visual analogue scales: a critical review. PsycholMed1988; 18:1007–1019.
17. Fairbank JCT, Couper J, Davies JB, et al. The Oswestry Low Back Pain Disability Questionnaire. Physiotherapy 1980; 66:271–273
18. Zung W. W. (1965). A self-rating depression scale. Archives of General Psychiatry, 12, 63–70.
19. Gibson T, Grahame R, Harkness J, Woo P, Blagrave P, Hills R. Controlled comparison of short-wave diathermy treatment with osteopatic treatment in non-specific low back pain. The Lancet. 1995. 346:258-261.
20. Khan AM, Salih M, Levack B. Lumbar corsets: compliance and effectiveness for lower back pain. Hong Kong Journal of Orthopaedic Surgery. 2002; 6(1):1-2.
21. Shakoor M A, Salek A K, Islam M Tariqul. Evaluation of the effects of selective rehablitation on the patients with chronic LBP. International Journal of Rheumatic Diseases. 2010; 13 (Suppl.1): 221–222.