



## ROLE OF BRACING IN IMPROVEMENT OF LOW BACK PAIN IN PATIENTS WITH SPONDYLOLISTHESIS

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**ABSTRACT** **BACKGROUND:** Incidence of Low back pain (LBP) is increasing day by day. Spondylolisthesis is a well known condition related to low back pain. Among the various treatment options, bracing often advised to these patients. But the effectiveness of bracing in reducing LBP is often debated. **AIM OF STUDY:** To assess the effect of Bracing in reducing LBP in patients with Spondylolisthesis. **METHOD:** This Randomized controlled trial was conducted on 80 patients of both sexes within the age group of 30-60 years with radiological grade 1&2 spondylolisthesis. They were randomly divided in two groups of same number (40 in each group)- Group-1: managed with therapeutic exercises only and Group-2 : managed with therapeutic exercises with bracing. Pain intensity was assessed VAS(0-10). Data collected in predesigned pretested proforma during follow ups(visit1 to visit4) and analyzed accordingly. **RESULT:** For VAS, in group1, there was significant changes( $p<0.001$ ) noted only in visit 1 & visit4, whereas significant improvement ( $p<0.001$ ) noted in all visits in group2. **CONCLUSION:** Therapeutic exercise with judicious bracing is more effective in reducing LBP among patients with grade 1&2 spondylolisthesis both initially & after a significant duration of time.

**KEYWORDS :** Spondylolisthesis, Low back pain, Lumbo-sacral brace, VAS.

### INTRODUCTION

Incidence of low back pain in Indian population is increasing day by day. Though the mechanical low back pain being the most common cause, but spondylolisthesis is also one of the important causes for that.<sup>1-4</sup> Often traumatic as well as non-traumatic spondylolisthesis presented with significant chronic LBP(CLB) along with various form of disabilities.<sup>5</sup>

Spondylolisthesis is the forward displacement of a vertebral body on the one below it. Management of these patients depends on the age of the patient, the severity of the symptoms and the pathogenesis. The goal of treatment of patients of spondylolisthesis with or without spondylolysis is pain and disability limitation and to restrict progressive slippage of vertebrae over one another. The treatment protocol for grade 1 and grade 2(radiological grading) spondylolisthesis patients remain conservative measures with therapeutic exercise with or without bracing. There are some school of thoughts which consider that bracing is not always necessary as a conservative measure in patients with spondylolisthesis.<sup>5-10</sup>

Throughout years a spectrum of successful management strategy for spondylolisthesis with or without spondylolysis have been employed, typically beginning with relative rest to avoidance of activities that increases pain (repetitive exercise). Bracing is quite common for symptomatic spondylolisthesis and spondylolysis. Though contradictory conclusions were made in previous studies regarding the role of bracing in improving LBP in these patients, however some consider it only for the patients who cannot or will not comply with their activity restrictions.<sup>7-10</sup>

Therefore, in this study we have compared the outcome in terms of pain improvement, assessed through VAS score, among two group of patients of grade 1 or 2 anterolisthesis who were under similar pharmacological treatment, prescribed exercise only to one group and exercise with bracing to another.

### AIMS AND OBJECTIVES

To assess the role of bracing in improvement of low back pain in patients with spondylolisthesis.

### MATERIALS AND METHODS

The present study was conducted in the Dept of Physical Medicine and Rehabilitation I.P.G.M.E&R, Kolkata during the period from March 2009 to August 2010. The institutional ethics committee clearance was obtained.

**INCLUSION CRITERIA:** Cases were selected from patients attending O.P.D in the Dept of Physical Medicine and Rehabilitation

during the above-mentioned period. Consequently 80 cases were selected, all of them between 30-60 years having grade 1 or grade 2 spondylolisthesis radiologically (only Anterolisthesis).

**EXCLUSION CRITERIA:** i)Associated neurodeficit, ii)Intense pain with minimal motion, iii)Retro or lateral listhesis. iv)Spinal infection, v)Spinal malignancy, vi)Compressed fracture, pathological fracture, vii)Patient having contraindication of therapeutic exercise and bracing, viii)Pregnancy & lactating mothers.

**STUDY POPULATION :** Patients of radiological grade 1 & 2 spondylolisthesis with or without spondylolysis who are attending the OPD of Physical Medicine and Rehabilitation Department of I.P.G.M.E&R, Kolkata.

**STUDY PERIOD :** One and half year

**SAMPLE SIZE :** Total 80 patients were divided into 2 groups of 40 patients randomly. Group 1 is given only therapeutic exercise while Group 2 treated with therapeutic exercise with bracing.

**SAMPLE DESIGN :** Prospective randomized open level control trial.

**STUDY TOOLS :** Visual analogue scale (VAS): VAS measured in 0 to 10 scale.

### RESULTS & ANALYSIS

The present study was carried out with 80 cases equally and randomly distributed into two groups. During this one and half year study all the data were recorded in predesigned and pretested proforma and analyzed by Statistica version 6 [ Tulsa, Oklahoma: StatSoft Inc, 2001] and GraphPad Prism version 4 [ San Diego, California: GraphPad Software Inc.2005]. Analysis was done by repeated measures ANOVA followed by Tukey's test as post hoc test when repeated measures ANOVA returns  $p$  value  $<0.05$ .

### Comparison of mean VAS values over time in Group 1[ Therapeutic exercise]

P VALUE  $<0.001$ , Number of groups 4, F 6.08

Tukey's test	Mean diff	Q	P value	95% CI off diff
V1 vs -V2	0.22	1.32	$>0.05$	-0.35-0.74
V1 vs -V3	0.46	3.17	$>0.05$	-0.08-1.15
V1 vs -V4	0.81	5.78	$<0.001$	0.37-1.14
V2 vs -V3	0.24	1.84	$>0.05$	-0.21-0.84
V2 vs -V4	0.64	4.47	$>0.05$	0.18-1.14
V3 vs -V4	0.43	2.82	$>0.05$	-0.16-0.98

In patients of group 1, statistically significant improvement between visit 1 & visit 4 in VAS Scale other pharmacological treatment being the same

### Comparison of mean VAS values over time in Group 2

P VALUE <0.001, Number of groups 4, F 60.23

Tukey's test	Mean diff	Q	P value	95% CI off diff
V1 vs -V2	0.81	5.48	<0.01	0.25 to 1.40
V1 vs -V3	1.45	10.06	<0.001	0.92 to 2.12
V1 vs -V4	2.69	18.56	<0.001	2.15 to 3.24
V2 vs -V3	0.65	4.56	<0.01	0.12 to 1.22
V2 vs -V4	1.91	13.05	<0.001	1.35 to 2.43
V3 vs -V4	1.24	8.48	<0.001	0.69 to 1.78

Statistically significant improvement noted with each visit.

### DISCUSSION

Spondylolisthesis is one of the common causes of CLBP. It may be traumatic or non-traumatic with or without associated with lysis. According to the literature, 4.4% kids are affected at the age of 6 years and 5.4% prevalence is reported in adulthood. The lower incidence of Spondylolisthesis of our study group may be due to low referral to this department.<sup>1-5</sup>

In our study most of the victims of Spondylolisthesis are female (mostly housewives), with female:male ratio around 1.73:1. This corroborates well with the evidences which shows that the congenital & degenerative forms of spondylolisthesis have a female to male predominance of 2:1 and 5:1, respectively.<sup>1,3</sup>

Another interesting finding noted in our study that 43% patients were urban dwellers & most of them are active working.

The key to diagnosis of spondylolysis and spondylolisthesis lies in routine radiographs of different views like anteroposterior, standing lateral and a Ferguson coronal. In our study we used this classification system & exclude grade 3 & 4 spondylolisthesis cases. In our study sample grade 1 spondylolisthesis were more common than grade 2 (radiological) spondylolisthesis. Interestingly facet joint arthropathy has the same incidence of 50% that of our clinical findings of facet joint pain. Routine MRI scan for every patient explored another interesting radiological finding as Ligamentum Flavum hypertrophy was present in 46% of the patient associate with radiological spondylolisthesis.

As per previous studies it was shown that isthmic variety of spondylolisthesis is more common at the level of L5-S1 and in degenerative variety it is the L4-L5 level which is the most common type. In our study 55% patient had spondylolisthesis at L4-L5 level as the degenerative group was more prominent in our study.

All the patient were followed up for 6 months in four visits and we found patients of group 1, i.e. only therapeutic exercise group showed improvement in the later half of the study in VAS scale. In this group VAS comparison with visit 1 to visit 4 shows statistically significant outcome ( $p < 0.001$ ). Whereas patients with bracing & exercise, i.e. group 2 showed statistically very significant improvement in VAS till the last visit. In this group there was statistically significant improvement during all visits & it was maintained till the last visit. As the previous studies showed improvements with bracing,<sup>7,9-10</sup> our study also supporting the fact & our patient group which are mainly the patients of degenerative spondylolisthesis responded well & in better way with both exercise & bracing.

**LIMITATIONS:** i) Small sample size, ii) Other contributory factors can not be ruled out completely, iii) Different working environment among the participants.

**CONCLUSION:** Comparative study of both the group showed Therapeutic exercise with bracing is more effective to improve the pain both initially & after significant duration of time.

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