
Research Article



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BRENT BROTZMAN PROTOCOL FOR IMPROVING LUMBAR RANGE OF MOTION IN PROFESSIONAL FAST BOWLERS WITH LOW BACK PAIN

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Abstract

It is estimated that 10- 15% of the athletic population experiences back injuries. Athletes who participate in sporting events that require repeated hyperextension or flexion of the spine, such as cricket pace bowlers, may be particularly at risk. This study aims to find the effectiveness of Brent Brotzman Protocol in improving lumbar range of motion in professional fast bowlers with low back pain. 20 elite professional cricket fast bowlers (mean age of 25.65) who had low back pain underwent Brent Brotzman rehabilitation protocol for 12 weeks. The outcome measures were lumbar range of motion. Pre – post rehabilitation measurements were compared using t test. The Results of the study showed that the range of motion lumbar spine improved statistically significantly ($p < 0.001$). This study concludes that Brent Brotzman Rehabilitation protocol is very effective in improving lumbar range of motion in professional fast bowlers with low back pain.

Keywords: Brent Brotzman Protocol, Low back pain, Professional fast bowlers, Lumbar range of motion.

Introduction

Cricket has had a history of being regarded as a leisurely, gentleman's game (Clark, 1996). Today, with a solid ball weighing approximately 156 grams propelled from a distance of 20m at a speed of about 140 km/h to an awaiting batter, it can hardly be called a gentleman game (Stockhill & Bartlett, 1993). Bowling involves repetitive twisting, extension and rotation in a short period while body tissues and footwear must absorb large ground reaction forces. However, it is the speed and the force of the action that singles fast bowlers out as being particularly prone to injury. The fast bowler uses one of two bowling techniques or a combination of these, known as side-on, front-on or mixed bowling. Particular bowling

techniques predispose bowlers to injury more than do others. Bowling too many overs in a single spell or bowling for too many spells is another factor which predisposes the fast bowler to injury. High performance young fast bowlers are more likely to bowl excessively throughout the growth period when the spine is immature. As a result they are more vulnerable to injury as the forces associated with fast bowling are unable to be absorbed. Mechanical factors are widely accepted in the aetiology of degenerative process and particularly to injuries of the lumbar spine. This is especially relevant in fast bowling, where a player must absorb both vertical and horizontal components of the ground reaction force up to a half of

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a tonne (Watson, 2005) during foot impact in the delivery stride. Such forces are transmitted to the spine through the lower limb, where the additional forces caused by rapid trunk hyperextension/flexion, lateral flexion and twisting are added as a result of the bowling action during delivery. The upper body motion at delivery is produced by counter-rotation away from the batsman in the transverse plane about the longitudinal axis of the body. Counter-rotations of 12-40% of shoulders on pelvis during delivery stride have been predicted to increase the incidence lumbar spondylolysis, disc abnormality and muscle injury in fast bowlers (Elliot, et al, 2002). To address improving trunk and hip mobility, this study focused on a set of training protocol as this has been shown to be a safe and effective way of increasing lumbar and hip joint mobility (Herzog et al., 1988; Gal et al., 1994; Herzog, 2000; Gatterman, 2003).

Methodology

This was a randomized, controlled, prospective, investigative trial. 45 fast bowlers were given screening questionnaire table1 from various

professional cricket academies and teams who are professionally participating in league matches regularly. Out of them, 20 elite fast bowlers who have Low Back Pain were taken to this study. Among those 20 bowlers, 15 were using mixed bowling action. 3 bowlers were bowling in side-arm action and 2 were using front- arm bowling action. The study was performed at Southern Railway stadium, Perambur, Chennai. all the subjects signed an informed consent form after carefully reading the information sheet provided by the researcher. The subjects were included in the study if they fulfil the following criteria. Only male subjects, who were between the ages of 18 to 35 years who have been playing Action Cricket for at least six months. Subjects who had any injuries in lower limb, cervical pain or any other medical ailment that will interfere with the study results according to the researcher, player who were all-rounder or part time wicket keepers were excluded. The outcome measures of this study were Range of motion measures for the lumbar spine were taken using inch tape and goniometry.

Table No. 01: screening questionnaire

Date:		
Title of research project: Brent Brotzman Protocol For Improving Lumbar Range Of Motion In Professional Fast Bowlers With Low Back Pain		
Name of researcher :		
Please circle the appropriate answer YES /NO		
1. Have you read the research information sheet?	Yes	No
2. Have you had an opportunity to ask questions regarding this study?	Yes	No
3. Have you received satisfactory answers to your questions?	Yes	No
4. Have you had an opportunity to discuss this study?	Yes	No
5. Have you received enough information about this study?	Yes	No
6. Do you understand the implications of your involvement in this study?	Yes	No
7. Do you understand that you are free to withdraw from this study?	Yes	No
At any time		
Without having to give any a reason for withdrawing, and		
Without affecting your future health care.		
8. Do you agree to voluntarily participate in this study?	Yes	No
Please ensure that the researcher completes each section with you If you have answered NO to any of the above, please obtain the necessary information before signing		
Please Print in block letters:		
Patient /Subject Name:	Signature:	
Research Student Name:	Signature:	

Table No. 02: Demographic Data of participants

S. No	Demographic parameter	Mean	Standard Deviation
1.	Age	25.65	2.47
2.	Mass (in kg)	75.9	6.49
3.	BMI (in kg/m ²)	24.81	1.48
4.	Duration of Bowling (in years)	11.8	1.98
5.	Average overs per week	44.5	9.44

The results are presented as mean and standard deviation (mean± SD). The out come measures were used before the intervention, at the end of 6th week and at the end of 12th week. Changes during the 12 weeks were calculated and compared

between groups using Student's paired t tests with 99% confidence intervals (CIs). Two-tailed significance tests were used in all the statistical analysis.

Table No. 03: T-Test for Lumbar Flexion (unit - cm)

		Mean	Sdt. Deviation	t – value	Significance
Pair 1	Pre- Test	3.93	.279	25.263	0.000*
	6 th week	4.79	.331		
Pair 2	6 th week	4.79	.331	22.177	0.000*
	12 th week	6.03	.353		
Pair 3	Pre- Test	3.93	.279	32.965	0.000*
	12 th week	6.03	.353		

Table No. 04: T-Test for Lumbar Extension (unit - cm)

		Mean	Sdt. Deviation	t – value	Significance
Pair 1	Pre- Test	1.96	.307	20.732	0.000*
	6 th week	2.91	.302		
Pair 2	6 th week	2.91	.302	12.445	0.000*
	12 th week	3.64	.252		
Pair 3	Pre- Test	1.96	.307	23.684	0.000*
	12 th week	3.64	.252		

Table No. 05: T-Test for Lumbar Side Flexion (Right) (unit - degree)

		Mean	Sdt. Deviation	t – value	Significance
Pair 1	Pre- Test	14.85	2.368	10.671	0.000*
	6 th week	21.20	3.054		
Pair 2	6 th week	21.20	3.054	11.711	0.000*
	12 th week	27.00	2.368		
Pair 3	Pre- Test	14.85	2.368	16.809	0.000*
	12 th week	27.00	2.368		

Table No. 06: T-Test for Lumbar Side Flexion (Left) (unit - degree)

		Mean	Sdt. Deviation	t – value	Significance
Pair 1	Pre- Test	15.05	2.212	11.526	0.000*
	6 th week	20.10	2.954		
Pair 2	6 th week	20.10	2.954	10.899	0.000*
	12 th week	26.85	3.884		
Pair 3	Pre- Test	15.05	2.212	16.464	0.000*
	12 th week	26.85	3.884		

Discussion

Exercise therapy that consists of individually designed programs, including stretching or strengthening, and is delivered with supervision may improve pain and function in chronic nonspecific low back pain. Strategies should be

used to encourage adherence (Hayden JA et al., 2005).

There is conflicting evidence on the effectiveness of exercise therapy compared to inactive treatments for chronic low back pain. Exercise therapy was

more effective than usual care by the general practitioner and equally as effective as conventional physiotherapy for chronic low back pain and may be helpful for chronic low back pain patients to increase return to normal daily activities and work. Our study shows that lumbar flexion was statistically highly significant ($p < 0.001$) between pre and post test value (table 2). In this study the result shows that lumbar extension was statistically highly significant ($p < 0.001$) between pre and post test value (table 3).

Our study shows that lumbar side flexion on both right and left side were statistically highly significant ($p < 0.001$) between pre and post test value (tables 4 and 5). This indicates that a 12-week low-impact exercise program may have a positive effect on Range Of Motion at the lumbar spine in subjects with low back pain.

Conclusion

Thus this study concludes that Brent Brotzman Rehabilitation protocol is very effective in improving lumbar range of motion in professional fast bowlers with low back pain.

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