

# Reduced non-dominant lumbar multifidi cross-sectional area is a precursor of low back injury in cricket fast bowlers



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## INTRODUCTION

Low back injuries are common in fast bowlers.<sup>1</sup> The lumbar multifidi muscle (LM) is classified as a stabiliser of the lumbar spine – it functions in an anticipatory capacity and stabilises the lumbar spine prior to movement.<sup>2</sup> Limited LM function leads to less segmental stability increasing the risk to and the recurrence of low back pain. Various cross-sectional studies have found that LM cross-sectional area (CSA) is reduced in the presence of low back pain and that asymmetry in LM CSA is associated with low back injury.<sup>5</sup> If a difference in non-dominant vs dominant LM CSA as measured at the start of the cricket season is found to be associated with the incidence of injury during the cricket season, the measurement of LM CSA can be included in pre-season screening programmes. Consequent early identification of fast bowlers at risk of injury, can lead to effective preventative interventions.

## AIM

The aim of this study was to investigate side-to-side symmetry of LM CSA as a potential precursor of injury in cricket fast bowlers.

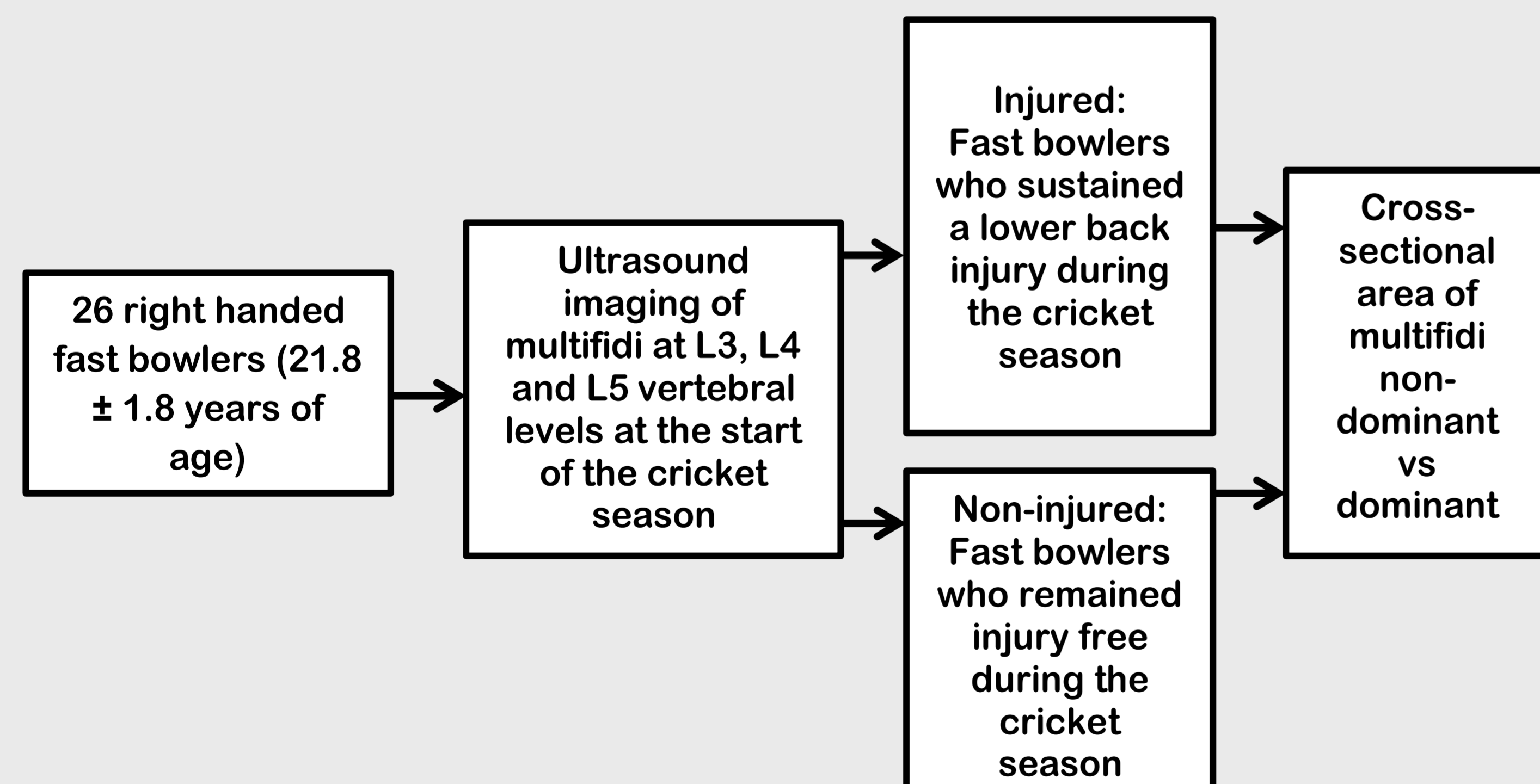
## METHODS

This study was a prospective cohort study

An injury was defined as a musculoskeletal condition that resulted in loss of at least one day of sporting activity or that occurred during a sporting activity that required medical attention and which forced the bowler to quit the activity. All bowlers were injury free at the start of the cricket season. Ethical clearance was obtained from the Human Research Ethics Committee of the University of the Witwatersrand (M10430).

The Wilcoxon matched pairs test was used to compare the LM CSA between the non-dominant and the dominant sides within the various groups. Statistical significance was set at  $p < 0.05$ .

Study procedures in terms of enrolment, assessment, allocation and analysis

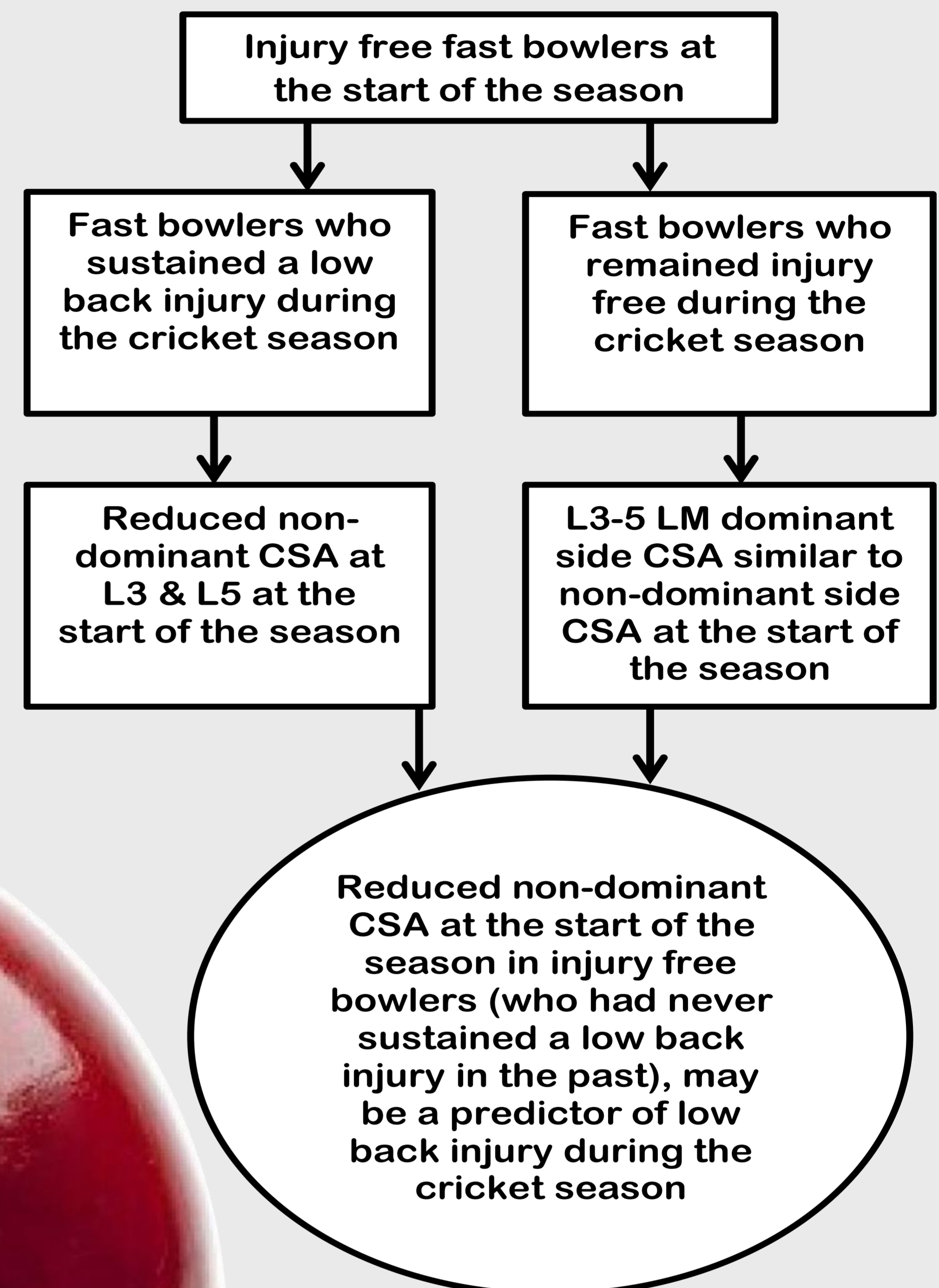


## ACKNOWLEDGEMENTS

I would like to acknowledge:

- The Carnegie Foundation, the National Research Foundation and the South African Society of Physiotherapy for funding.
- The fast bowlers who participated in this study for their time and enthusiasm.

## RESULTS



## LM CSA at L3, L4 and L5 at the start of the cricket season

	Non-dominant	Dominant	p-value
	Median (range)	Median (range)	
<b>Non-injured (n=10)</b>			
L3 (cm <sup>2</sup> )	7.41 (5.8)	7.58 (3.9)	0.80
L4 (cm <sup>2</sup> )	7.88 (3.23)	7.95 (3.54)	0.08
L5 (cm <sup>2</sup> )	7.27 (3.29)	6.97 (3.1)	0.37
<b>Lower back injured (n=5)</b>			
L3 (cm <sup>2</sup> )	5.80 (3.69)	7.38 (2.61)	0.04*
L4 (cm <sup>2</sup> )	8.35 (4.85)	7.80 (3.06)	0.67
L5 (cm <sup>2</sup> )	6.49 (2.10)	7.38 (3.54)	0.04*

## CONCLUSIONS

Even though the fast bowling action is an asymmetrical action, dominant and non-dominant LM CSA in injury free fast bowlers were similar. The lack of asymmetry between dominant and non-dominant LM CSA in the injury free fast bowlers may be because multifidi is classified as a stabiliser of the lumbar spine,<sup>2</sup> is responsible for creating stiffness of the lumbar motion segments and does therefore not adapt following long-term, unilateral, repetitive functional tasks.

Although all fast bowlers were injury free at the start of the season, those bowlers who ended up sustaining a low back injury during the cricket season had a smaller LM CSA at L3 and L5 on the non-dominant side. Hides et al.<sup>6</sup> suggested that the LM muscle does not recover spontaneously after remission of low back pain. It is therefore noteworthy that none of the bowlers, who sustained a low back injury during the season, had sustained a low back injury previously. It can thus be suggested that the CSA of LM should be further investigated as a potential precursor of low back injury.

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