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PATELLAR CARTILAGE VOLUME OF THE BACK LEG VERSUS THE HIGHER LOADED FRONT LEG IN CURRENT ELITE MALE ENGLISH CRICKET FAST BOWLERS

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Abstract:

Purpose: The aim of this study was to determine if the fast bowling action in cricket causes a positive adaptive response to increase patellar cartilage volume in the higher loaded front leg versus the back leg.

Methods: Eleven healthy elite male English cricket fast bowlers between the ages of 17 and 26 were studied. Three-dimensional sagittal FIESTA (fast imaging employing steady state acquisition) MRIs of both knees were acquired at 3 T. Manual segmentation was used to analyse scans of the front and back leg patellar cartilage volumes. Compartmental cartilage volume was calculated for each player using medial and lateral patellar cartilage compartments, where the medial compartment included the patellar ridge. A Wilcoxon rank sum test was used to compare the compartmental and total volumes of the front and back leg patellar cartilage.

Results: The cricket fast bowlers included in this study had played an average of 3.9 years at an elite level. The MRIs were acquired after the conclusion of the most recent season. The most significance was seen in the medial compartment, with a median front leg medial cartilage volume of 1992.0 mm³ versus a back leg medial cartilage volume of 2441.8 mm³ (p=0.2773). The total front leg patellar cartilage volume had a median value of 4623.3 mm³ versus a back leg volume median value of 4604.9 mm³ (p=0.4478). Full results are shown in the table.

Conclusions: In this sample of elite male English cricket fast bowlers, there was no statistically significant difference in patellar cartilage volume in the front versus the back leg. This suggests that, although the patellar cartilage in these athletes does not significantly increase in response to the increased force experienced in the front leg, the bowling action does not significantly decrease patellar cartilage volume. Future work should analyse the medial and lateral femorotibial cartilage compartments in addition to patellar cartilage in order to examine whether a positive adaptive response is seen in the cartilage of the whole knee of the front leg in this population.

Front and back leg patellar compartmental cartilage median values [standard deviation] and p-values

Patellar Cartilage Compartment	Front leg, mm ³ (Median [SD])	Back leg, mm ³ (Median [SD])	p-value
Medial	1992.0 [469.2]	2441.8 [570.9]	0.2773
Lateral	2446.2 [424.1]	2425.2 [411.4]	0.7227
Total	4623.3 [844.6]	4604.9 [808.0]	0.4478

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