

KNEE JOINT POSITION SENSE IS NOT DECREASED BY FOOTBALL MATCH-INDUCED FATIGUE



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Introduction

Proprioception is an important element of both static and dynamic balance, and may play an important role in preventing acute injuries. Furthermore, the incidence of re-injuries and the cause of chronic injuries may be attributed, to a greater extent, to a deficit in proprioception. In the present study, we intended to verify to what extent a football match affects proprioception.

Methods

Thirteen youth male football players (Mean±SD: 16.9±0.3 yrs; 173±8 cm; 66.8±8.4 kg) completed a football match (90min duration). Joint position sense (JPS) was used to measure the proprioception capacity in a closed kinetic chain technique, before and immediately after the football match. Four reflective markers were fixed with double-sided adhesive tape to the skin of the lateral thigh and leg over the apex of the greater trochanter, the iliotibial tract level with the posterior crease of the knee when flexed to 80°, the neck of the fibula, and the prominence of the lateral malleolus. Each player tried to reproduce the target position in three consecutive active trials.

A two-dimensional automatic digitizing module (50Hz) of the Ariel Performance Analysis System (APAS) software (Ariel Dynamics, USA) was used to measure the angle of the knee from videotape records of the target and the response positions.

Each response position was determined as the average of 5 consecutive angles. Absolute, relative, and variable angular errors were reported as outcome variables. Additionally to JPS measurements, dominant-leg standing balance (flamingo test) and vertical jump performance (countermovement jump test; CMJ) were assessed pre- and post-match. Descriptive statistics were used and presented as mean ± SD. Paired t-tests were performed to compare pre- and post-match performance. Statistical significance was set at $P < 0.05$.

Results

After the football match, a significant decrease in absolute error (pre: 8.04±4.90°; post: 4.10±4.06°; $P = 0.016$) was observed, whereas no significant differences were found in both relative (pre: 5.15±8.08°; post: 2.54±5.26°; $P = 0.24$) and variable angular (pre: 2.93±1.30; post: 2.38±1.97°; $P = 0.28$) errors.

Looking to pre- to post-match percentages of change, a significant decrease of the relative error was observed from pre- to post-match (97.66%; $P = 0.04$).

However, postural balance showed no significant differences between pre- and post-match (pre: 11.5±3.8 falls; post: 11.7±5.6 falls; $P = 0.82$), whereas CMJ increased by 5.79% (pre: 35.4±4.8 cm; post: 37.5±5.2 cm; $P = 0.04$).

Conclusion

After the football match, it was found an increase in the positioning accuracy in reproducing the target knee position. This indicates that a football match leads to an improvement in proprioception, eventually as a response to the increase in the acuity of the sensorimotor system of the players. Additionally, the football match did not impair postural balance, whereas vertical jump performance improved pre- to post-match.

Altogether, these findings suggest that match-related proprioception changes are less likely to be related to the increment of the number of injuries in the last periods of the football match.