Football Medicine Strategies for Knee Injuries

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HISTORY OF HAMSTRING INJURIES IS ASSOCIATED WITH POOR CONTROL OF LUMBAR EXTENSION

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Introduction

Movement control tests can identify uncontrolled movement (UCM) in people with and without musculoskeletal pain. A link has been established between aberrant movement control (uncontrolled movement) and risk of injury (Roussel et al 2009). The presence of uncontrolled movement may also be a potential predictor of re-injury.

A battery of movement control tests has been designed to identify the site, direction and threshold of aberrant movement control (UCM) in professional footballers (The Football Matrix).

Hamstring injuries are one of the most common injuries in footballers. This study explores the association of aberrant movement control with a history of injury in professional footballers.

Methods

Ninety male professional footballers from two UK premier league football clubs and one Dutch football club were screened with The Football Matrix Movement and Performance Screen.

The Football Matrix uses a series of twenty multi-joint functionally relevant movement control tests that identify the site, direction and threshold of uncontrolled movement. These movement control tests are based on the theory of movement dissociation (Sahrmann 2002). The Movement and Performance Screen includes 5 tests to identify low threshold uncontrolled movements, 5 tests to identify high threshold uncontrolled movements, 5 sport relevant (high threshold) tests and 5 tests to identify restrictions. The tests identify specific sites of UCM (e.g. low back, scapula, hip). They further classify the direction of the UCM at the problem site (e.g. low back - flexion, scapula - forward tilt). In addition, this classification process evaluates the threshold of control failure as being either low threshold (related to movement coordination and timing) or high threshold (related to strength or speed deficiencies). The MPS identifies multiple movement weak links that are classified in terms of their site, direction and threshold of uncontrolled movement. Each movement weak link is prioritised as high risk (fix now) or low risk (fix soon).

Each player reported history of injury(s).

An exploratory analysis was undertaken to identify if the failure of any particular test (site, direction and threshold of uncontrolled movement) was associated with a history of previous injury.

Results

99% of this group of professional footballers failed tests of lumbopelvic movement control tests. The sites and direction of uncontrolled movements for the low back and hip and the high risk areas are detailed in Table 1. 79% of these footballers demonstrated uncontrolled lumbar extension in the series of high threshold tests (strength and speed) of lumbopelvic movement control.

Knee pain was the most common reported previous injury (47%). Hamstring injury was the second most common reported previous injury (20%). Neither of these injuries varied in prevalence by Club (P>0.05).
Uncontrolled low back extension (high load) showed a significant association with a history of a hamstring injury (P>0.05).

Uncontrolled Movement		**Low Threshold**		**High Threshold**	
Site	**Direction**	**(L)**	**(R)**	**(L)**	**(R)**
Low Back	Flexion	30%	30%	30%	30%
	Extension	70% *	78.9% *	70% *	78.9% *
	Rotation	82.2% *	74.4% *	84.6% *	81.1% *
	Sidebend	54.40%	46.70%	92.2% *	80.0% *
Hip	Flexion	35.60%	36.70%	88.9% *	87.8% *
	Rotation	26.70%	28.90%	73.3% *	80.0% *

Table1. Frequency of failed tests of Site, Direction & Threshold for the low back and hip. (***** indicates high risk)

Conclusions
Uncontrolled movement is frequently observed in professional footballers. Uncontrolled high threshold lumbopelvic extension shows a significant association with a history of hamstring injury. The Football Matrix Movement and Performance Screen can identify uncontrolled movement. Further research should analyse movement control retraining following injury, and explore how movement control retraining can be used to prevent injuries.

References
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