

Changes in muscle activation following balance and technique training and a season of football

Anterior Cruciate Ligament (ACL) injuries are common in the sport of Australian football. In an attempt to prevent these injuries exercise training programs focused on balance and sidestepping technique have been developed. The aim of this investigation was to determine if performing an injury prevention exercise program consisting of balance and technique training alongside typical Australian football training can alter muscle activation patterns during planned and unplanned side stepping activities. Through evaluation of muscle activation patterns, researchers can assess if the training program led to adaptations in the muscle's ability to provide support to the knee. If a muscle better supports the knee during planned and unplanned side stepping task, the athletes risk of injury will be reduced.

In this investigation, two groups of players were biomechanically assessed in a laboratory. A group of 16 players completed typical Australian football training without any specific balance and technique training. Another group completed a specific balance and technique training program as part of their warm-up. Both groups had muscle activation assessed during planned and unplanned sidestepping tasks at the beginning and end of the community football season. Results of this investigation indicated that the balance and technique training did not significantly improve activation of the muscles supporting the knee greater than when football training alone was performed. However, an interesting finding was that following a season of Australian football, muscle activation was significantly lower and valgus loading (a significant risk factor for ACL injury) was 80% greater than at the start of the season.

How this research can be of use:

- In this population of community Australian football players balance and technique training did not improve muscle activation.
- Biomechanical risk factors associated with ACL injuries were significantly greater at the end of the season than at the start. Therefore, players may potentially be at a greater risk of ACL injuries later in the season.

Published source:

[Donnelly CJ, Elliot BC, Doyle TLA, Finch CF, Dempsey AR, Lloyd DG. Changes in muscle activation following balance and technique training and season of Australian football. *Journal of Science Medicine in Sport*.](#)

Funding The PAFIX study was funded by a nationally competitive research grant from the (Australian) National Health and Medical Research Council (NHMRC)—Project ID 400937; The Australian Centre for Research into Injury in Sport and its Prevention (ACRISP) is one of the International Research Centres for Prevention of Injury and Protection of Athlete Health supported by the International Olympic Committee (IOC). CFF was supported by an NHMRC Principal Research Fellowship (ID: 565900).