

**Results** Respiratory viruses were detected in 35%, 36% and 25% of the athletes, the staff members and the controls, respectively. Ten out of 26 (38%) athletes and 6 out of 36 (17%) staff members and 3 out of 52 (6%) controls experienced symptoms of respiratory infection. Asymptomatic infections were identified in 4%, 19% and 21%, respectively. The etiology of respiratory infections was detected in 84% of the cases. Four virus clusters were identified caused by rhinovirus, coronavirus 229E and NL63 and respiratory syncytial virus B. The clinical presentation of the infections in athletes was mild and the median duration of symptoms was 5.5 days. One athlete lost a competition due to a viral respiratory infection.

**Conclusions** The athletes had a 6-fold increase in risk of illness compared to normally physically active controls. The athletes had significantly less asymptomatic infections compared to staff and controls. Despite the infection prevention protocols, viruses circulated actively within the team.

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ABSTRACT WITHDRAWN

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#### DOES ACUTE FATIGUE NEGATIVELY AFFECT THE LOWER EXTREMITY INJURY RISK PROFILE? A SYSTEMATIC AND CRITICAL REVIEW

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**Background** Acute fatigue is hypothesized to alter injury risk profiles by affecting intrinsic risk factors (i.e. postural control, hamstring strength). However, no systematic overview exists that merges the insights of prospective lower extremity injury risk profiling with the effect of acute fatigue on functional test performance.

**Objective** The objective of this review was to identify the influence of acute fatigue on prospectively determined modifiable intrinsic risk factors for lower extremity injuries and to determine if individual fatigue outcomes should be integrated within an athlete centred injury risk profile and prevention strategies.

**Design** Systematic review

**Methods** PubMed (MEDLINE), Web of Science, PEDro, and Cochrane Library were searched until 29 May 2019. Studies were eligible when the study outcomes encompassed intrinsic modifiable risk factors, an acute fatigue intervention, and included healthy athletes or physically active people. Intrinsic modifiable risk factors were identified through recent systematic reviews and meta-analyses. Referenced original research papers were used to determine outcome measures associated with increased injury risk.

**Main Outcome Measurements** Acute fatigue effect on the intrinsic modifiable risk factors for lower extremity injuries.

**Results** Forty studies reported acute fatigue effects on modifiable risk factors, with eight studies matching all criteria for data-extraction. Acute fatigue can decrease single leg postural control, decrease ankle joint position sense, decrease isokinetic strength of hamstring and quadriceps muscles and can affect isokinetic H:Q ratios.

**Conclusions** Acute fatigue affects prospective intrinsic modifiable risk factors, indicating an altered injury risk profile for lateral ankle sprain, patellofemoral pain syndrome and hamstring injuries when fatigued. Current data does not allow conclusions for non-contact ACL injury risk. Clinicians should consider acute fatigue responses as part of injury risk profiling strategies. Future research should allow for individual fatigability as a relevant injury risk outcome and merge insights from athlete centred injury risk profiling and fatigue research.

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#### A SYSTEMATIC VIDEO ANALYSIS OF THE MECHANISM OF INJURY OF ACHILLES TENDON RUPTURES

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**Background** There is currently limited evidence identifying the mechanism of Achilles tendon rupture (ATR). Identification of this mechanism would aid rehabilitation and injury prevention strategies.

**Objective** Determine the movement pattern (mechanism of injury) for ATRs.

**Design** A systematic video search was completed of all publicly available videos capturing ATR. Identified videos were then analysed in slow motion by three blinded reviewers.

**Setting** Subjects of any athletic level participating in sporting events where included.

**Patients (or Participants)** Any subject suffering a verifiable ATR captured on video. Ruptures were verified either by self-report or media release in the case of athletes. A total of 495,120 eligible videos were identified, with 57 separate ATR events being retained for data analysis.

**Interventions (or Assessment of Risk Factors)** An initial review was used to develop an understanding of important variables. These included Ankle, knee, Hip and trunk movements, Plantar flexor muscle activity (eccentric/concentric), contact/non-contact, sporting activity, age, gender and where possible activity duration prior to rupture.

**Main Outcome Measurements** Identification of the mechanism (description of the movement pattern associated) ATR.

**Results** A total of 57 subjects with confirmed ATR were identified. Various sports were associated with ATR's, field sports accounted for 27 whilst other sports accounted for 30. High load eccentric activity of the plantarflexor muscles was identified as occurring in all injuries. This was associated with dorsiflexion of the ankle and concurrent knee extension in 100% of subjects. Hip extension was only identified in 86% of subjects and 91% of ATR's were non-contact.

**Conclusions** The injury mechanism for Achilles tendon rupture involves dorsiflexion of the foot with knee extension, whilst the plantarflexor muscles are eccentrically contracting. Further research is required to determine if the addition of a similar movement/motor control task would improve rehabilitation or serve as an injury prevention strategy.