

485 LATERAL LIGAMENT COMPLEX ANKLE SPRAIN EPIDEMIOLOGY: UNITED STATES COLLEGE ATHLETES, 2009/10–2014/15

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Background Lateral ligament complex (LLC) ankle sprains are among the most common injuries in United States (US) college athletes. But, there is limited information about the specific epidemiology of such injuries.

Methods De-identified data from the National Collegiate Athletic Association (NCAA) Injury Surveillance Program (ISP) was analysed for 25 sports from the 2009/10–2014/15 academic years. Analyses were limited to injuries diagnosed as LLC sprains. Descriptive statistics include frequencies, rates per 10,000 athlete-exposures (AE), and rate ratios (RR) with 95% confidence intervals (CI).

Results LLC sprain was the most common injury diagnosis in 25 NCAA sports, with 2,429 reported in the sample from the study period. This results in a LLC sprain rate of 4.95/10,000 AEs and a national annual estimate of 16,022 LLC sprains in NCAA athletes. The sports with the highest LLC sprain rates were men's/women's basketball (11.96 and 9.50/10,000 AE, respectively), and men's/women's soccer (7.43 and 8.36/10,000 AE, respectively). Football had the largest national estimate in NCAA athletes (3,606 per year), despite having a moderate LLC sprain rate (6.87/10,000 AE). Most LLC sprains occurred during practices (57.3%); however, the LLC sprain rate was higher in competition than in practice (RR = 3.29; 95% CI: 3.03–3.56). Overall, 44.3% of LLC sprains required participation restriction time under 24 hours; 33.7%, 1–6 days; 15.7%, 7–21 days; and 3.6%, over 21 days. In total, 11.9% of LLC sprains were recurrent. The sports with the largest proportion of recurrent LLC sprains were women's basketball and women's outdoor track and field (both 21.1%). The most common injury mechanisms for LLC sprains were player contact (41.4%), and non-contact (27.4%).

Conclusions LLC sprains are the most common injury in US college athletes. Nearly 20% require at least 7 days of participation restriction time. Future research and interventions should address men's/women's soccer and basketball.

486 SURVIVAL ANALYSIS IN SPORTS INJURY RESEARCH: A SYSTEMATIC REVIEW

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Background International literature recognises that sports people who have sustained an injury have a high likelihood of a subsequent injury, either of the same type again or a different one. Taking into account the dependency of subsequent injuries within athletes is important, otherwise, results have greater precision than is warranted and there is possible biasing of results away from the null. Survival methods for recurrent events data can be applied to take into account the potential statistical relationships between subsequent injuries. Various survival analysis approaches exist and the selection of a correct model is important. The aim of this systematic review was to identify and evaluate the appropriate use of survival analysis methods in sports injury incidence studies.

Methods The review was performed and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) Statement, comprising a traditional systematic search of literature and a hand search of key sports medicine journals. Descriptive data on the studies were extracted (e.g. aim, setting, follow up) along with detailed information on the reported survival analysis methods. The appropriateness of selected models, and their reporting, were examined in-depth.

Results There were 699 publications screened from which 123 were included for further review. Studies were mainly focused on the reported time to first injury (n = 53%) or the time to recover/return to play after injury (19%). Recurrent or subsequent injuries were only considered in 10% of papers. Graphical approaches (Kaplan-Meier curves) were most commonly used (51% of studies), along with simple univariate (30%) and Cox-regression techniques (88%).

Conclusions While a number of researchers have used survival methods for analysis of sports injury data, there is scope for improvement in the statistical approaches used and, specifically, in the reporting of subsequent injuries.

487 PILOTING INJURY SURVEILLANCE SYSTEM IN SAUDI ARABIA

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Background The Injury & Accidents Prevention Program (IAPP) of Saudi Health Ministry designed an Injury Surveillance System with the aim to gather regular ongoing information for prevention and control of injuries and efficient use of resources. World Health Organisation, Ministry of Interior, Traffic Police, Saudi Red Crescent and other partners were involved during the process.

Method This system was piloted in selected health regions, involving a multistage stratified random sample. In first stage, half of 20 health regions were selected, followed by random selection of 14 health facilities, stratified by sub-sector and facility level health. Two physicians were trained from each selected health facility on the predesigned tool and procedures; they collected the data and regularly transferred to IAPP through Regional Coordinators, for entry and analysis.

Results Seven health regions reported 10008 injuries including 74.5 % males (mean age 23.3 ± 15.9); mostly (81%) 35 years or less. About 76% injury cases were unintentional and 35% occurred at home followed by workplace (20%) and roads (19%). Less than 5% of the injuries were severe in nature and 25% moderate; mainly occurred due to falls (31%), blunt force (20%) and traffic crashes (15%). Injuries mainly resulted into closed wounds (44%), open wounds (29%) and fractures (14%).

Discussion Pilot was intended to test the system and identify procedures that could be improved before scaling up; at this stage the cases do not represent total injuries reporting to health facilities. Implementing the surveillance system across the Kingdom would be challenging, but will generate useful information for decision making.

Conclusion The pilot identified efficiency of the surveillance system and its capacity to capture injury cases reporting to health facilities, but necessitates including paramedics for workload distribution; and requires more ownership from regional offices.