

Evaluating the Concussed Athlete: Co-Occurring Psychiatric Conditions Predict Psychological Function and Recovery

Jeremy P. McConnell¹, Cali A. VanValkenburg¹, Vincent C. Nittoli², Adam W. Shunk², Courtney D. Jensen¹. ¹University of the Pacific, Stockton, CA. ²St. Vincent Sports Performance, Indianapolis, IN.

(No relevant relationships reported)

More than 35 million American children ages 5 to 18 and approximately 400,000 collegiate athletes engage in organized sports. Sport participation bears a risk of traumatic brain injury (TBI). The annual incidence of sport-related TBI exceeds 1.5 million and is increasing among youth athletes. Many sufferers of TBI present with co-occurring psychiatric conditions, such as anxiety, depression, and learning disabilities. The effect of these conditions on diagnosis and prognosis remains largely unexplored.

PURPOSE: To assess the effect of co-occurring conditions on TBI symptoms in youth athletes.

METHODS: We analyzed 80 student-athletes (primary education through college) who underwent comprehensive evaluation following a TBI. Medical histories were collected, neuropsychological tests were conducted, and co-occurring psychiatric conditions were diagnosed. Co-occurring conditions were 1) attention deficit and hyperactivity disorders, 2) anxiety disorders, 3) depression and mood disorders, 4) adjustment disorders, and learning disabilities. Tests of behavior and cognitive function were 1) the ImPACT test, and 2) the Behavior Assessment System for Children 2nd Edition (BASC). Linear regressions tested the effect of co-occurring conditions on psychological and behavioral outcomes.

RESULTS: Subjects were 16.0 ± 2.6 years of age, 56.3% were male, and 72.5% were diagnosed with ≥ 1 co-occurring condition. Linear regressions revealed the number of diagnoses to predict poorer visual motor speed ($p=0.031$), poorer reaction time ($p=0.010$), and, summarizing speed and accuracy indices, poorer performance on the cognitive efficiency index ($p=0.043$). The number of co-occurring conditions was also a significant predictor ($p<0.05$) of 13 individual BASC categories and all BASC composite assessments, indicating poorer behaviors and attitudes.

CONCLUSION: TBI associates with acute neural deficits and psychological changes. We found that co-occurring psychiatric diagnoses may compound these complications in youth athletes. When appraising the severity of a TBI in this population, a comprehensive psychiatric evaluation may be warranted to understand and accurately characterize the scope and prognosis of the condition.

Seasonal Distribution Of Cold Weather Injuries In The U.s. Army

David W. DeGroot, FACSM¹, Catherine Rappole², Robyn Martin³. ¹Tripler Army Medical Center, Honolulu, HI. ²Army Public Health Center, Aberdeen Proving Ground, MD. ³Naval Health Research Center, San Diego, CA.

(No relevant relationships reported)

The incidence of and risk factors for cold weather injury (CWI) in the US Army have been well characterized. Unlike the 'heat season,' when the risk of heat illness is highest and application of risk mitigation procedures is mandatory, there is no definition of the 'cold season' and the proportion of CWI that occur outside of a defined cold season is unknown.

PURPOSE: To identify the cold season and to determine the within-year seasonal distribution of CWI at select Army installations.

METHODS: The 10 US Army installations with the highest frequency of CWI from 1 July 2008-30 June 2013 were identified and used for analysis. In- and out-patient CWI data (ICD-9-CM codes 991.0-991.9, first, second or third diagnoses only) were obtained from the Defense Medical Surveillance System. Piecewise regression analysis was utilized to determine the critical cut points at which trends in CWI significantly increased or decreased, indicating the start and end, respectively, of the cold season. The proportional distribution of EHI within the cold season, overall and by installation, was determined.

RESULTS: During the study period there were 1,012 CWI and the overall rate was 0.79 per 10,000 person-months. The highest rate occurred during the month of February (2.16 per 10,000 person-months) and the installation with the highest rate was Ft Drum, NY (5.40 per 10,000 person-months). There was at least one CWI during every week of the year during the 5 year study period. Piecewise regression analyses indicated that on average the cold season started during week 14 (Sept 30) and ended during week 39 (March 24). Using this definition, 83.2% (842/2012) of CWI occurred during the cold season. The longest cold season occurred at Ft Wainwright, AK (34 weeks) and the shortest at Ft Carson, CO (17 weeks), illustrating the considerable variability between locations.

CONCLUSIONS: Our data suggest that the risk of CWI exists year round at select Army installations, though further research sub-grouped by type of CWI is warranted. Based on the piecewise regression analysis, we recommend that the 'cold season' starts 1 October and continues through March, as ~83% of CWI occurred during this period.

Incidence and Severity of Game-Related College Football Thoracoabdominal Injuries on Artificial versus Natural Grass

Theresa M. Gustavson, Michael C. Meyers, FACSM, Shad K. Robinson. Idaho State University, Pocatello, ID.

Reported Relationships: T.M. Gustavson: Contracted Research - Including Principle Investigator; Partial support by FieldTurf USA.

In the past, serious injuries have been attributed to playing on artificial turf. Newer generations of artificial turf, however, have been developed to duplicate the playing characteristics of natural grass. No long-term studies have compared articular and muscle trauma of the thoracoabdominal region between the two surfaces.

PURPOSE: To quantify incidence and severity of game-related thoracoabdominal collegiate football injuries on artificial turf vs natural grass.

METHODS: A total of 24 universities were evaluated over 8 competitive seasons for injury incidence rates (IIRs) across injury severity, injury category, injury mechanism and situation, primary type of injury, anatomical location, type of tissue injured, elective imaging and surgical procedures, and turf age.

RESULTS: Of the 1,237 collegiate games documented, 628 (50.8%) were played on artificial turf vs 609 (49.2%) played on natural grass. A total of 379 thoracoabdominal injuries were reported with 147 (38.8%) occurring on artificial turf, and 232 (61.2%) on natural grass. MANOVAs per 10 games indicated a significant playing surface effect by injury severity ($F_{2,379} = 7.505$; $P = .001$), primary type of injury ($F_{12,379} = 4.412$; $P = .000$), tissue type ($F_{3,379} = 9.412$; $P = .000$), elective imaging and surgical procedures ($F_{3,379} = 3.517$; $P = .007$), and turf age ($F_{2,379} = 91.093$; $P = .000$), but not by injury category ($F_{3,379} = 2.175$; $P = .089$), injury mechanism ($F_{3,379} = 1.439$; $P = .133$), or injury situation ($F_{8,379} = 1.329$; $P = .181$). Univariate analyses indicated significantly lower ($P = .05 - .0001$) IIRs across severity, both in 1st degree, 2.1 (95% CI, 1.8-2.5) vs 2.9 (2.5-3.2), and 2nd degree IIRs, 0.1 (95% CI, 0.1-0.2) vs 0.7 (0.5-0.9); defensive positions, 0.8 (95% CI, 0.6-1.1) vs 1.4 (1.2-1.7); contusions, 1.3 (95% CI, 1.1-1.6) vs 2.0 (1.7-2.3); muscle, 2.0 (95% CI, 1.7-2.3) vs 3.0 (2.6-3.4); MRI, 0.1 (95% CI, 0.0-0.2) vs 0.2 (0.1-0.4); and turf lasting 4-7 years, 0.8 (95% CI, 0.6-1.1) vs 0.9 (0.7-1.2), and 8+ years 0.1 (95% CI, 0.1-0.2) vs 0.5 (0.4-0.8) when comparing artificial turf vs natural grass, respectively.

CONCLUSION: Since minimal differences existed between artificial turf and natural grass over an 8-year period of competitive play, artificial turf is a practical alternative when comparing thoracoabdominal injuries in collegiate football.

Racquet Sport-Related Injuries Treated in United States Emergency Departments, 2007-2016

Andrew McBride, Morteza Khodaei, 80045, FACSM. University of Colorado - Denver, Aurora, CO. (Sponsor: Morteza Khodaei, FACSM)

(No relevant relationships reported)

PURPOSE: Racquet sports, especially tennis, have grown in popularity in the United States. There are limited studies analyzing injuries in badminton, squash, and other lesser-known racquet sports. We aimed to analyze the injury pattern in all racquet sports that resulted in the United States emergency department (USED) visits.

METHODS: This was a retrospective analysis of National Electronic Injury Surveillance System data on racquet-sport related injuries that presented to USEDs for the past 10 years.

RESULTS: From 2007-2016, there were 8,024 cases of racquet-sports related injuries that presented to USEDs. The majority of these injuries were in men (61%). Caucasians had the highest percentage of injuries (47%) followed by African Americans (7%) and Asian Americans (3%). Sprain/strain were the most common types of injuries (34%) followed by fracture (13%) and contusion/abrasion (12%) The body part most frequently injured was the ankle at 13% followed by facial injuries at 10%. Over 93% of injuries were treated and