Concussion Increases Lower Extremity Musculoskeletal Injury Risk after Return-to-Play among Collegiate Athletes
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Context: Current research is beginning to uncover the long lasting neurological effects of concussions. Some of these studies have found concussion’s effects on cognition and emotions. However, few have investigated or found neuromuscular impairments that may lead to increased risk of debilitating musculoskeletal injuries. **Objective:** To determine if collegiate athletes are at increased risk of acute lower extremity musculoskeletal injury during the 90-day period following return-to-play from concussion. **Design:** Medical records review for concussion and lower extremity musculoskeletal injuries to create retrospective cohort study. **Setting:** Division one University athletics program. **Patents or Other Participants:** Records from 272 division one collegiate athletes (male= 208, female= 64, age= 19.9 years) participating during the years of 2011-2014 were reviewed. Each concussion incident was paired with up to three non-concussed subjects at the time of the concussion incident. The control subjects were matched with concussed subjects based on sport, gender, position and game play. **Interventions:** Concussion cases were reviewed for lower extremity musculoskeletal injuries during the time period between their return-to-play date and the 90-day period after the return-to-play date. Congruently, the non-concussed subjects paired with the concussion case were reviewed for lower extremity musculoskeletal injuries during the same time period. A lower extremity musculoskeletal injury was defined as an acute fracture, muscle strain or ligament sprain of the hip, groin, thigh, knee, shank, ankle and foot resulting in time loss of participation in team practices and or competition. **Main Outcome Measures:** The number of lower extremity musculoskeletal injuries sustained during the 90-day period after the concussion case’s return-to-play date was recorded for each concussion case and their respective non-concussed matched controls. A conditional logistic regression was used to compare concussed subjects to their corresponding matched controls to assess the association between concussion and subsequent risk of acute lower extremity musculoskeletal injuries. **Results:** The odds of sustaining a lower extremity musculoskeletal injury were 2.66 times higher in concussed athletes than in their non-concussed counterparts (Odds ratio: 2.66; 95% confidence interval= 1.12, 6.28; p=.026). The incidence of lower extremity musculoskeletal injury during the 90-day period after the return-to-play date was higher in concussed athletes (15/87; 17%) as compared to matched controls (16/189; 8%). **Conclusion:** Concussed collegiate athletes were at a greater risk for lower extremity musculoskeletal injuries after being cleared to return-to-play than non-concussed collegiate athletes. These results support recent research that the effects of concussion last longer than clinical symptoms and signs illustrating that more research is needed on proper return-to-play criteria for collegiate athletes.