A Helmet-Less Tackling Training Intervention to Decrease Head Impacts in American Football
Myers JL, Swartz EE, Broglio SP, Cook SB, Cantu RC, Ferrara M, Guskiewicz KM: University of New Hampshire (Durham, NH)

Context: In an attempt to reduce acute and chronic brain injury risk in American football, researchers and stakeholders have sought improvements in helmet technology, limiting the number of contact practices, and altering game rules. However, these do not directly address the fundamental cause of injury: impacts to the head. In addition, the concept of risk compensation suggests that wearing a helmet contributes to the behavior of engaging the head in tackling and blocking. Objective: To study the effectiveness of a novel helmetless-tackling intervention to reduce head impact exposure in college football players. Design: Prospective, randomized controlled investigation. Setting: NCAA FBS Division I collegiate football. Participants: Fifty subjects with at least two years eligibility were stratified by position (offense, defense) and randomized equally (n=25) to treatment or control groups. Interventions: The treatment consisted of Helmetless Tackling Training (HuTT™) drills performed twice per week during the pre-season (3 weeks) and once per week throughout the competitive season (16 weeks). Drills involved executing tackling techniques against an upright pad or padded shield held by a teammate at 50-75% effort without helmets and shoulder pads. The control group underwent non-contact football skills at the same frequency and duration. Both treatment and control activities were supervised by the football coaching staff following standardized instruction. Subjects were assigned an xPatch™ impact sensor which was worn to record head impacts sustained during each practice and game. Subject attendance was recorded for all team activities associated with risk exposure. Main Outcome Measures: Frequency of all impacts ≥10g threshold of linear acceleration were filtered and exported into spreadsheet format. Frequency of head impacts per athlete exposure (AE) were compared between groups at three time-points (pre, mid, and end of season) using repeated measures analysis of variance (ANOVA). Significant interactions and main effects (P<.05) were followed with dependent and independent t-tests. Results: The HuTT™ intervention resulted in a 28% reduction in head impact frequency/AE (13.84±7.27 versus 9.99±6.10) at the end of the season, while the control group frequency remained the same (P=.009). By the end of the season, the intervention group experienced an average of 30% fewer impacts/AE (9.99±6.10 versus 14.32±8.45) compared to the control group (P=.045). Conclusions: While a helmet is necessary during full contact practices and games, it also imparts a false sense of security that enables impacts to the head. These data suggest that practicing tackling and blocking under a controlled, supervised environment improved tackling behavior by reducing head impact frequency in collegiate football players after one season. Future research is necessary to determine the effect with football participants on other levels of play (youth, high school). Funding: NATA Research and Education Foundation. Word Count: 437.