

Association Between Head Impact Kinematics and Physical Load Burden in Division I College Football Players

Bradley Lauck

BACKGROUND: Monitoring factors that contribute to repetitive head impact exposure (RHIE) in collegiate American football may provide necessary information to reduce the risk of injury. Interestingly, head impact frequency and physical demands vary across position groups and session types, but the effect of these factors on RHIE is poorly understood.

PURPOSE: Determine if physical load burden predicts RHIE, and examine gameplay characteristics that may affect physical load burden and RHIE.

METHODS: During the 2017-2021 football seasons, 15 offensive and defensive linemen, 11 linebackers and tight ends, and 15 defensive backs, running backs, and receivers, were prospectively observed (41 players in total). Participants wore halters embedded with Catapult Vector GPS monitoring system to quantify player load, and helmets equipped with Head Impact Telemetry System to quantify head impact kinematics.

RESULTS: Player load was associated with RHIE ($p R^2 = 0.31$; $p p = 0.025$). Both player load and RHIE was greater in games than practices ($p p = 0.343$).

CONCLUSION: Characteristics of physical load burden are associated with RHIE among Division I collegiate American football players.