The Relationship Between Reaction Time and Head Impact Volume in High School Football Players

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Evidence suggests that it is not only concussive impacts that affect a person’s neurocognitive functioning but also the accumulation of sub-concussive impacts that a person sustains.

Using the HITS system, a series of accelerometers located in the helmets of high school football players, we looked at the frequency and severity of impacts a player sustained during the course of a season.

CNS Vital Signs, a computerized neurocognitive assessment tool, was then used to assess the athlete’s reaction time.

The goal of this study was to determine if the preseason reaction time of an athlete affected their:

1. overall number of head impacts
2. average number of head impacts per practice
3. severity of average head impacts they sustained

By determining what puts a football player at risk for higher rates and levels of impact we could:

1. Implement an early intervention for safer technique
2. Tone an athletes skills so they are at less risk for head impacts
Results

- Despite our hypotheses, reaction time does not lead to an increase in overall impacts sustained, average hits per practice nor magnitude of hits sustained, leading us to believe there are other factors that exacerbate these conditions.

- Future research should continue to consider an athlete's change in neurocognitive functioning with respect to impacts received to help relate cognitive impairments to impact biomechanics.