

Concussion History and Years of High-Risk Sport Participation on Cognitive Control

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Although increased attention has been devoted to sports-related concussions, much still remains unknown about this silent injury. A better understanding of the long-term effects of single and repetitive concussive and sub-concussive impacts on the brain is needed. It is also important to determine whether participation in high-risk sports results in future cognitive impairment. **PURPOSE:** To evaluate the relationship between sports-related concussion history and years of playing high-risk sport on neuroelectric and task performance indices of attention and cognitive control. **METHODS:** Eighty-two athletes (35 females; 20.5 ± 1.6 years) with variable histories of physician-diagnosed concussions completed an ImPACT, as well as a modified flanker task and an attentional blink paradigm while EEG data was collected. The type of sport played and number of years of participation were also reported to determine if cognitive impairments may result from long-term participation in a high-risk sport. We examined the N2 and P3 event-related potentials (ERPs) to assess cognitive control processes, while response time and accuracy were used as overt behavioral measures of cognition. **RESULTS:** No significant differences were found on the ImPACT or behavioral performance measures between athletes with and without a history of concussion, $p > .05$. No significant differences were found in behavioral performance measures between contact and non-contact sport athletes, $p > .05$. Bivariate correlations between years of high-risk sport participation and neuroelectric and behavioral measures of cognitive performance were also not significant, $p > .05$. N2 and P3 amplitudes were suppressed across both cognitive tasks in athletes reporting one or more concussions, suggesting persistent neuroelectric impairments, $p < .05$. **CONCLUSION:** The current findings suggest that individuals with a concussive history may experience impairments in cognition; however, differences in neuroelectric findings were not accompanied by differences in behavioral performance. These findings add to the growing evidence that concussions may result in persistent, but detectable decrements in cognition, which may not be observable with more traditional clinical evaluations.