Medical Xpress

Study finds no correlation between brain function and head impacts after 2 seasons of tackle football

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Many parents, potential players and medical providers are increasingly wary of youth contact sports participation. The concern over the

potential short- and long-term effects of head impacts experienced by youth football players has likely driven decreasing participation, according to a group of researchers.

To date, most studies that have attempted to understand connections between neurocognitive function and sub-concussive head impacts have been retrospective—and inconclusive. Tracking athletes in real time can account for confounding factors such as pre-participation cognitive ability.

This was the idea behind a study led by Sean Rose, MD, pediatric sports neurologist and co-director of the Complex Concussion Clinic at Nationwide Children's Hospital. He collaborated with MORE Foundation, The Sports Neurology Clinic, and other researchers to follow more than 150 youth tackle football players ages 9 to 18.

Recently, they published the results of the first two years of the study in *Journal of Neurotrauma*, and the researchers plan to continue the study an additional two years. The data from the first season was published in 2018 in *Journal of Head Trauma Rehabilitation*.

"When trying to determine the effects of repeated, sub-concussive head impacts, prospective outcomes studies are an important addition to the existing retrospective studies," says Dr. Rose. "We designed this study to include a wide variety of neurocognitive outcomes tests, to give us new insights into how repeated hits might influence outcomes."

The pre and postseason assessments used to measure outcomes included:

- Neuropsychological (cognitive) testing
- Symptoms assessment
- Vestibular and ocular-motor screening
- Balance testing

- Parent-reported ADHD symptoms
- Self-reported behavioral adjustment

Sensors placed in the helmets recorded sub-concussive head impacts during practices and games. In the full 166 player group, a computerized test of processing speed declined over time. The other 22 outcome measures improved or did not change over time. Neither the total number of impacts nor the intensity of impacts correlated with change in outcomes from before season 1 to after season 2 in the 55 players who participated in both seasons of the study.

"So far, the study is showing us that sub-concussive impacts don't seem to be associated with changes in neurocognitive function over two seasons of youth football. And we're finding that other factors, such as ADHD and younger age are more predictive of worsening scores on our pre and post-season tests," says Dr. Rose. "However, we remain concerned about repetitive head impacts in children, and longer follow up times are necessary to look for delayed effects on neurocognition."

More information: Sean C. Rose et al, Neurocognitive Function and Head Impact Burden over Two Seasons of Youth Tackle Football, *Journal of Neurotrauma* (2019). DOI: 10.1089/neu.2019.6519

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