

# Difference found in brain area linked to memory among college football players

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Preliminary research finds that within a group of collegiate football players, those who experienced a concussion or had been playing for more years had smaller hippocampal volume (an area of the brain important for memory) than those with fewer years of football experience, according to a study in the May 14 issue of *JAMA*. In addition, more years of playing football was correlated with slower reaction time.

The hippocampus is a brain region involved in regulating multiple cognitive and emotional processes affected by concussion and is particularly sensitive to moderate and severe [traumatic brain injury](#) (TBI). Emerging evidence suggests that the hippocampus is also vulnerable to mild TBI, as indicated by volume reduction and postconcussion abnormalities of hippocampal function. There are limited data on the long-term anatomical and cognitive consequences of concussion and subconcussive impacts on young athletes, according to background information in the article.

Rashmi Singh, Ph.D., of the Laureate Institute for Brain Research, Tulsa, and colleagues investigated the relationship between years of football playing experience and history of concussion with cognitive performance and [hippocampal volume](#) in collegiate [football players](#). The study included 25 players with a history of clinician-diagnosed concussion, collegiate football players without a history of concussion (n = 25), and non-football-playing, healthy controls (n = 25). High-resolution anatomical magnetic resonance imaging was used to quantify

[brain](#) volumes. Scores on a computerized concussion-related cognitive test were used to assess the athletes.

The researchers found smaller hippocampal volumes in [collegiate football](#) athletes compared with healthy control participants. Players with a history of concussion had smaller hippocampal volumes than players without [concussion](#). Number of years of football-playing experience was inversely associated with both hippocampal volume and reaction time.

"The present study design limits our ability to dissociate [regard as unconnected] among the many possible factors involved in these hippocampal volume findings, but our study should serve as an impetus for future longitudinal research to investigate the neuroanatomical and cognitive changes in young contact-sport athletes. The clinical significance of the observed hippocampal size differences is unknown at this time," the authors conclude.

**More information:** [DOI: 10.1001/jama.2014.3313](https://doi.org/10.1001/jama.2014.3313)

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