

# Brain changes found in small study of former NFL players

January 7 2013, by Carina Storrs, Healthday Reporter

---



White matter damage could be at the root of mental deficits among retired players, researcher says.

(HealthDay)—In a small study of former NFL players, about one quarter were found to have "mild cognitive impairment," or problems with thinking and memory, a rate slightly higher than expected in the general population.

Thirty-four ex-NFL players took part in the study that looked at their mental function, [depression symptoms](#) and [brain images](#) and compared them with those of men who did not play professional or college football. The most common deficits seen were difficulties finding words and poor [verbal memory](#).

Twenty players had no symptoms of impairment. One such player was

Daryl Johnston, who played 11 seasons as fullback for the Dallas Cowboys. During his accomplished career as an offensive blocker, Johnston took countless hits to the head. After he retired in 2000, he wanted to be proactive about his [brain health](#), he told university staff.

All but two of the ex-players had experienced at least one concussion, and the average number of concussions was four. The players were between 41 and 79 years old.

The study was published online Jan. 7 in the *JAMA Neurology*.

The current study provides clues into the [brain changes](#) that could lead to these deficits among NFL athletes, and why they show up so many years after the head injury, said study author Dr. John Hart Jr., medical science director of the Center for BrainHealth at the University of Texas at Dallas.

Hart and his colleagues did advanced MRI-based imaging on 26 of the retired NFL players along with 26 of the other participants, and found that former players had more damage to their brain's white matter. White matter lies on the inside of the brain and connects different [gray matter](#) regions, Hart explained.

"The damage can occur from [head injuries](#) because the brain is shaken or twisted, and that stretches the white matter," Hart said.

An expert on sports [concussion](#) is familiar with the findings.

"The most important finding is that [the researchers] were able to find the correlation between white matter changes and cognitive deficits," said Kevin Guskiewicz, founding director of the Center for the Study of Retired Athletes at the University of North Carolina at Chapel Hill.

The imaging tests also revealed differences in blood flow to certain areas of the brain among the athletes who had cognitive impairments, with regions involved in word finding associated with increased blood flow and regions linked to naming and verbal memory associated with drops in blood flow.

The fact that some areas are getting more blood than expected suggests that there is active [white matter](#) damage going on in these areas, and that they are trying to compensate with more blood flow, Hart said. If the damage had already been done, or if it was associated with normal aging, you would expect to see only drops in [blood flow](#), he added.

Hart said he hopes that these imaging tests will prove useful for diagnosing athletes with cognitive impairments, although he pointed out that the tests used in the current study were only for research purposes.

Guskiewicz said there could be a real-world benefit.

"Seeing changes early, at age 45 or 50, might allow us to intervene through cognitive rehabilitation or some sort of medication," Guskiewicz said. "Often when these things are diagnosed, it is too late."

The new study also found that four players had fixed cognitive impairment, which had probably not changed since their head injury, and two had dementia, which was a rate similar to the general population. In all, eight players were diagnosed with depression, and three of those also had cognitive deficits.

The fact that many of the players in the study did not go on to develop any kind of deficit suggests that there are other factors involved, such as environmental or genetic factors, Hart said.

The current study did not find a relationship between the number of

concussions that a player experienced and whether they went on to develop a cognitive impairment.

Age definitely contributed to mental shortcomings, Hart said. While the average age of former players with a [cognitive impairment](#) was 67, players without an impairment and healthy control participants were 55 and 60 years old on average.

"With better equipment and resting people right after an injury, it may be that when guys nowadays age, [these impairments] won't be present," said Guskiewicz, who is a member of the NFL head, neck and spine committee.

Ex-Cowboy Johnston is now working with the Center for BrainHealth to recruit other former [players](#) to get evaluated, UT Dallas staff said.

**More information:** You can find more about cognitive impairment at the [U.S. National Institute on Aging](#).

Copyright © 2013 [HealthDay](#). All rights reserved.

Citation: Brain changes found in small study of former NFL players (2013, January 7) retrieved 18 April 2024 from <https://medicalxpress.com/news/2013-01-brain-small-nfl-players.html>

|  |
|--|
| <p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p> |
|--|