People diagnosed with traumatic brain injury may have increased risk of Parkinson’s disease, shows study

April 19, 2018

People who have been diagnosed with a mild concussion, or mild traumatic brain injury, may have a 56 percent increased risk of developing Parkinson’s disease, according to a study published in the April 18, 2018, online issue of *Neurology*®, the medical journal of the American Academy of Neurology.

“Previous research has shown a strong link between moderate to severe traumatic brain injury and an increased risk of developing Parkinson’s disease but the research on mild traumatic brain injury has not been conclusive,” said senior study author Kristine Yaffe, MD, of the University of California, San Francisco, the San Francisco Veterans Affairs Medical Center, and a member of the American Academy of Neurology. “Our research looked a very large population of U.S. veterans who had experienced either mild, moderate or severe traumatic brain injury in an effort to find an answer to whether a mild traumatic brain injury can put someone at risk.”

Moderate to severe traumatic brain injury was defined as a loss of consciousness for more than 30 minutes, alteration of consciousness of more than 24 hours or amnesia for more than 24 hours. Mild traumatic brain injury was defined as loss of consciousness for zero to 30 minutes, alteration of consciousness of a moment to 24 hours or amnesia for zero to

24 hours.

For the study, researchers identified 325,870 veterans from three U.S. Veterans Health Administration medical databases. Half of the study participants had been diagnosed with either a mild, moderate or severe traumatic brain injury and half had not. The study participants, who ranged in age from 31 to 65, were followed for an average of 4.6 years. At the start of the study, none had Parkinson's disease or dementia. All traumatic brain injuries were diagnosed by a physician.

A total of 1,462 of the participants were diagnosed with Parkinson's disease at least one year and up to 12 years after the start of the study. The average time to diagnosis was 4.6 years.

A total of 949 of the participants with traumatic brain injury, or 0.58 percent, developed Parkinson's disease, compared to 513 of the participants with no traumatic brain injury, or 0.31 percent. A total of 360 out of 76,297 with mild traumatic brain injury, or 0.47 percent, developed the disease and 543 out of 72,592 with moderate to severe traumatic brain injury, or 0.75 percent, developed the disease.

After researchers adjusted for age, sex, race, education and other health conditions like diabetes and high blood pressure, they found that those with any kind of traumatic brain injury had a 71 percent increased risk of Parkinson's disease, those with moderate to severe traumatic brain injury had an 83 percent increased risk, and those with mild traumatic brain injury had a 56 percent increased risk of Parkinson's disease.

Researchers also found that those with any form of traumatic brain injury were diagnosed with Parkinson's disease an average of two years earlier than those without traumatic brain injury.

"This study highlights the importance of concussion

prevention, long-term follow-up of those with concussion, and the need for future studies to investigate if there are other risk factors for Parkinson's disease that can be modified after someone has a concussion," said lead study author Raquel C. Gardner, MD, of the University of California, San Francisco, the San Francisco Veterans Affairs Medical Center, and a member of the American Academy of Neurology. "While our study looked at veterans, we believe the results may have important implications for athletes and the general public as well."

One limitation of the study was that medical codes were used to identify people with traumatic brain injury and some cases may have been missed. In addition, mild traumatic brain injury may be underreported in those serving in combat.

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