

Just one concussion could raise Parkinson's risk

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If you've ever had a mild concussion, your risk of developing Parkinson's disease goes up by 56 percent, a new study of more than 300,000 U.S. veterans suggests.

"Upwards of 40 percent of adults have had a traumatic brain injury [concussion], so these findings are definitely concerning," said study author Dr. Raquel Gardner. She is an assistant professor of neurology at the University of California, San Francisco, and the San Francisco VA Medical Center.

But Gardner stressed that the findings don't mean everyone who has ever had a concussion is doomed to develop the degenerative neurological disorder that affects coordination of movement.

"Even in this study, the vast majority of veterans with traumatic brain injury (TBI) did not develop Parkinson's," she said.

Dr. Rachel Dolhun, vice president of medical communications for the Michael J. Fox Foundation for Parkinson's Research, pointed out the lifetime risk of Parkinson's is probably about 1 to 2 percent, so a greater than 50 percent increase in that risk isn't as alarming as it sounds.

"Having a TBI doesn't definitively equate with getting Parkinson's disease. The risk is still pretty small," Dolhun said.

But these findings do lend credence to the idea that some professional athletes have developed Parkinson's disease as a result of their athletic careers. The most famous is probably boxer Muhammad Ali.

Gardner explained that "we'll never know definitively, but it's absolutely a possibility. Many have suspected that his head injuries contributed to his Parkinson's disease, but it's impossible to say for sure."

Previous research has linked TBI and Parkinson's disease, but the new study's design and large size makes it "among the most definitive," according to Gardner.

Both Gardner and Dolhun said there are a number of plausible theories as to how a brain injury—even a slight one—might lead to Parkinson's.

Gardner said it's possible that traumatic brain injuries could cause abnormal proteins to accumulate in the brain. It's also possible that a brain injury might make the brain less resilient to aging, she suggested.

Dolhun said another possibility is that a head injury might cause damage to dopamine-producing cells (which are cells that don't function properly in Parkinson's disease).

The new study identified more than 325,000 veterans from three U.S. Veterans Health Administration databases. Half of this group had experienced a traumatic brain injury at some point in their lives. The TBIs were mild, moderate or severe. The other half of participants had never had a TBI. Some of their injuries were due to combat, but some were from falls or motor vehicle accidents.

Study volunteers were aged 31 to 65, and were followed for up to 12 years.

None of the vets had a diagnosis of Parkinson's when the study began. During the study, almost 1,500 were diagnosed with Parkinson's disease. Of those, 949 had previously had a traumatic brain injury.

The overall risk of developing Parkinson's in this group was slightly more than a half of 1 percent for those with a traumatic brain injury. For those without brain injuries, the risk of Parkinson's was just under one-third of 1 percent, the study found.

When the researchers compared those who had brain injuries to those who didn't, and controlled the data for other risk factors—such as age, sex, race, education and other health conditions—the overall risk of

Parkinson's disease was 71 percent higher for people who had any type of TBI.

The risk for those with a mild TBI (concussion) was 56 percent higher, and for those with moderate to severe TBIs, the risk was 83 percent greater, the findings showed.

Gardner said the study highlights the need to prevent head injuries. She also said that people should reassess their lifestyle and try to live as healthy as possible.

"A healthy lifestyle gives the brain an extra chance at being resilient," she noted.

Dolhun said that it's not clear exactly what causes Parkinson's or what can prevent it. But she agreed that the best advice right now is "to try to prevent TBIs and to practice good, solid healthy living with regular exercise and a healthy diet."

The study was published online April 18 in the journal *Neurology*

More information: Raquel Gardner, M.D., assistant professor, neurology, University of California, San Francisco, and San Francisco VA Medical Center; Rachel Dolhun, M.D., vice president, medical communications, the Michael J. Fox Foundation for Parkinson's Research; April 18, 2018, *Neurology*

Learn more about Parkinson's disease from the [Michael J. Fox Foundation for Parkinson's Research](#).

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