

Concussions in Teenagers Tied to Multiple Sclerosis Risk



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By [Gretchen Reynolds](#)

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Here's yet another reason to protect young athletes from head trauma: A large-scale new study found that concussions in adolescents can increase the risk of later developing multiple sclerosis. The risk of multiple sclerosis, or M.S., an autoimmune nervous system disorder with an unknown cause, was especially high if there were more than one head injury.

The overall chances that a young athlete who has had one or more head injuries will develop multiple sclerosis still remain low, the study's authors point out. But the risk is significantly higher than if a young person never experiences a serious blow to the head.

The drumbeat of worrying news about concussions and their consequences has been rising in recent years, as most of us know, especially if we have children who play contact sports. Much

of this concern has centered on possible links between repeated concussions and chronic traumatic encephalopathy, a serious, degenerative brain disease that affects the ability to think.

But there have been hints that head trauma might also be linked to the development of other conditions, including multiple sclerosis. Past studies with animals have shown that trauma to the central nervous system, including the brain, may jump-start the kind of autoimmune reactions that underlie multiple sclerosis. (In the disease, the body's immune system begins to attack the fatty sheaths that enwrap and protect nerve fibers, leaving them vulnerable to damage and scarring.)

Some past epidemiological studies of people also have noted an increased incidence of M.S. in adults who experience head trauma. These studies typically were small-scale, though, and looked at the issue in adults.

But with more and more young people, including children, being diagnosed with concussions, some experts have begun to wonder if there might be links between an injury early in life and a later diagnosis of M.S.

So for the [new study, which was published last month in Annals of Neurology](#), scientists at Orebro University and the Karolinska Institute in Sweden and other institutions decided to look at the medical histories of every person in Sweden who had been given a multiple sclerosis diagnosis since 1964, when the diagnosis began to be reported to a national medical database.

They found 7,292 men and women who had been given M.S. diagnoses through the end of 2012.

Then, to provide a contrasting cross-section of these patients' peers, they matched each of those with M.S. with 10 other Swedes who shared their age, gender and county of residence, pulling this data from another database about every Swedish citizen. In total, the scientists analyzed data involving more than 80,000 people.

Finally, the researchers looked into whether any of these people had visited a Swedish hospital for treatment of a concussion or broken bone when they were young. (The Swedes keep extensive health databases.)

The researchers included the information about broken bones because the symptoms of M.S. often begin to affect people years before a diagnosis and can include clumsiness and falls. If people had stumbled and incurred head injuries because they had early M.S., then their disease might be contributing to their concussions and not the other way around, a statistical issue known as reverse causation.

In that case, however, people with M.S. should also have a high incidence of broken bones because of their falls. So the researchers looked at a range of bone injuries as a way to assess the likelihood that reverse causation might be responsible for their injuries.

They also homed in on concussions that occurred when the people in the study were young, dividing that time frame into concussions among children younger than 11, and adolescents between ages 11 and 20.

Then they analyzed the numbers. The results were concerning. Adolescents who had experienced one concussion were about 22 percent more likely to later develop M.S. than those who had not had such head trauma. The risk rose by about 150 percent if a young person had sustained multiple concussions.

Interestingly, concussions experienced during childhood did not contribute to a greater risk of M.S. later.

The findings suggest that “there could be a link” between head injury during adolescence and the development of M.S. as an adult, says Scott Montgomery, a professor of clinical epidemiology at Orebro University, who led the study.

Adolescent brains seem to be less physiologically resilient than those in younger children, he adds, making them potentially more vulnerable to long-term consequences from concussions than children. The youngsters also might have experienced milder concussions, since they are smaller and would likely hit with less impact.

Still, the absolute incidence of M.S. among young people in the study who had had a concussion remained small, Dr. Montgomery says, and many of those who had been injured in adolescence never developed the disease. It is probable, he says, that other factors are involved, including an underlying genetic susceptibility to the condition that, in some young people, might be awakened by a blow to the head.

The study also was observational, meaning that it can link concussions in youth to a greater risk for M.S., but not prove that one causes the other.

The findings remain important and cautionary, however.

“Physical activity and participation in sports should be encouraged in young people,” Dr. Montgomery says. “But we should try to minimize the risk of young people experiencing head injuries.”

And for those who might have had a concussion or three during youth, “talk with your doctor,” Dr. Montgomery says, “especially if you are experiencing any symptoms” of M.S., such as double vision, dizziness or balance problems. These conditions do not necessarily indicate a developing problem, he says, but should be assessed.