Medical Xpress

Gene variants involved in stress responses affect 'post-concussive' symptoms

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Variations in a gene that affect the body's responses to stress influence the risk of developing so-called post-concussive symptoms (PCS) after car crashes, reports a study in *Psychosomatic Medicine: Journal of Biobehavioral Medicine*, the official journal of the American Psychosomatic Society.

The study provides new evidence that "post-concussive" symptoms are often unrelated to the severity of head or brain injury. "Rather, such symptoms appear to develop due to changes in the function of systems in the body that respond to stressful events," comments Dr. Samuel McLean of University of North Carolina, Chapel Hill, one of the study's key authors.

Stress-Related Gene Affects Symptoms after Car Accidents

The study included 943 adults who came to the emergency department after non-life-threatening motor vehicle collisions (MVCs). Patients with very severe head injury—causing prolonged loss of consciousness or marked memory loss (amnesia)—were excluded from the study.

After six and 12 months, the patients were examined for occurrence of "post-concussive" symptoms (PCS) such as headache, dizziness, and difficulty concentrating. Such symptoms commonly occur after traumatic and stressful events, and may persist for months or even years.

"Costs due to PCS have been estimated at over $17 billion annually in the United States alone," the researchers note.

Post-concussive symptom scores were highest in the hours after the accident, improved at six weeks, and generally stable after six months. Several specific patient characteristics were linked to chronic PCS, including patient-reported mental and physical health factors. However, post-concussive symptoms were not related to any of the crash-related factors analyzed—including head impact during collision.

Genetic testing was performed to determine if common genetic differences affecting the function of an important stress system in the body affect PCS outcomes. The results showed that individual differences in the "FK506 binding protein number 5" (*FKBP5*) gene significantly affected the risk of having persistent symptoms.

Although the findings are preliminary, they may have important implications for understanding and managing the problem of PCS after minor trauma. "More than 90 percent of individuals who come to the emergency department after motor vehicle collision are discharged to home after evaluation, and persistent PCS are common in this population," comments Dr. McLean. "Together with previous data, our study findings indicate that we should stop calling these symptoms 'post-concussive.'"

"The symptoms are very real, and they can really affect people's quality of life, but there is little evidence that they have anything to do with head injury in these patients," Dr. McLean adds. "This is very important, because we can't figure out how to better help prevent and treat such symptoms until we understand their cause." This study shows that a combination of genetic factors and a patient's mental and physical health are important predictors for long-term symptoms after a motor vehicle accident.

More information: "Association of Epidemiologic Factors and Genetic Variants Influencing Hypothalamic-Pituitary-Adrenocortical Axis Function With Postconcussive Symptoms After Minor Motor Vehicle Collision." DOI: 10.1097/PSY.0000000000000253

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