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Editorial Article

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Mild Brain Injury

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Editorial

The risk of developing an addiction to alcohol, tobacco, or drugs increases in the period immediately following mild traumatic brain injury (mTBI) but decreases over time, new research shows. The historical prospective study showed that in the short-term, individuals with mTBI had a significantly increased risk for alcohol dependence, nicotine dependence, and nondependent abuse of drugs or alcohol compared with a similarly injured non-mTBI comparison group. "Our findings suggest an increased risk for incidence of alcohol dependence, nondependent abuse of drugs or alcohol, and nicotine dependence during the first 30 days following mild TBI and a risk thereafter for alcohol dependence for at least 6 months after injury," the authors, led by Shannon C. Miller, MD, from the Veterans Affairs Medical Centre, Cincinnati, Ohio, write.

According to the investigators, addiction-related disorders have been linked to an increased risk for TBI caused by motor vehicle accidents and falls. However, they note, little research has assessed the reverse pattern. The investigators sought to assess possible associations between mTBI, commonly known as a concussion, and addiction-related disorders in active-duty US military personnel. The researchers used electronically recorded demographic, medical, and military data for more than one half million active-duty US Air Force service members. mTBI was identified using International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes listed by the Centres for Disease Control and Prevention in 2003. According to these codes, mTBI is defined as transient confusion or disorientation, memory loss, or brief loss of consciousness. The researchers selected 5065 incident cases among airmen who were on active duty for at least 180 days between October 1, 2001, and September 30, 2008. The comparison group included 44,733 airmen who were diagnosed with an outpatient injury to the torso, spinal cord, abdomen, pelvis, digestive tract, or genitourinary tract and were designated as the "other-injured group" for the purposes of the study. Time after mTBI was divided into 3 periods: 1 to 30 days, 31 to 179 days, and longer than 180 days. The researchers found that the hazard for alcohol dependence was significantly elevated for all 3 periods in the mTBI group compared with the other-injured group. The hazard for alcohol dependence was highest in the first 30 days following a diagnosis of mTBI (hazard ratio [HR], 3.48; 95% confidence interval [CI], 1.86 - 6.51). The likelihood of alcohol dependence decreased consistently with time. At 31 to 179 days post mTBI, the HR was 2.66 (95% CI, 1.86 - 3.81), and at 180 days or longer post mTBI, the HR was 1.70 (95% CI, 1.31 - 2.21). The pattern for nicotine dependence and nondependent abuse of drugs or alcohol was similar, with the highest HR for nicotine (HR, 2.03; 95% CI, 1.56 - 2.66) and for drugs or alcohol (HR, 2.11; 95% CI, 1.65 - 2.70) occurring within the first 30 days of mTBI. The study also showed a greater risk for opioid dependence or abuse in the 1- to 30-day period (HR, 6.14; 95% CI, 1.20 - 31.31) and also in the 31- to 179-day period (HR, 3.98; 95% CI, 1.14 - 13.93). However, these 2 HRs were based on only 3 and 4 diagnoses, respectively. Previous

research has indicated that the effects of mTBI resolve quickly, but the results of the current study suggest that alcohol dependence "may be a long-lasting adverse health outcome following mild TBI," the investigators write. “Given the increasing emphasis and awareness of mild TBI in both military and civilian populations, these findings may have far-reaching clinical and military readiness implications," the authors suggest. They add that their study has limitations, including the use of multiple ICD-9-CM codes to identify mTBI. They also suggest that the codes may not have been assigned accurately in all cases, but that the strategy of using the other-injured comparison group and the use of 3 different periods could mitigate these limitations. Dr. Miller and colleagues also caution against any cause-and-effect interpretations of the study results. "Although a causal mechanism seems biopsychosocial plausible, it is not clinically intuitive that hazard ratios would be elevated so soon after the incident mild TBI (within 30 days)," they write. They conclude that any alcohol or drug use after TBI is concerning because of the potential for reduced healing, risk for seizures and repeat TBI, and exacerbation of residual cognitive, emotional, and behavioural impairments. Further, the authors call for routine screening for addiction-related disorders after mTBI and for alcohol dependence screening to continue for at least 6 months following the injury.