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A new study published in the September issue of the *Journal of Alzheimer's Disease* reports that even a single mild explosion can cause changes in the brain that have similarities to those found in diseases like Alzheimer's disease and chronic traumatic encephalopathy.

Flying debris or getting thrown against other objects are not the only things that make explosions so dangerous. The primary shock waves that emanate from explosions also can kill a person if they are intense enough. However, most blast survivors experience less powerful shock waves that cause less severe immediate symptoms, such as temporary disorientation or headaches, but on the surface leave victims apparently unscathed. Scientists are especially concerned when these mild blast exposures happen repeatedly--likening them to the repetitive hits endured by boxers and other athletes.

"Some of the big questions in mild traumatic brain injury are about a molecule called tau" said Dr. David Cook of VA Puget Sound Health Care System and University of Washington. "In many brain diseases, tau gets chemically modified to create something called 'phospho-tau'. Phospho-tau is important because it is the starting building block of 'tau tangles', which can build up over time and damage brain cells."

The Seattle team used a rodent laboratory model to study brain changes caused by mild blast exposure. Dr. Cook noted, "We were a bit surprised to find that after only a single mild blast, phospho-tau remained elevated for at least a month."

"Tau pathology is part of end-stage TBI," said Dr. Iboja Cernak of the University of Alberta, Canada and a co-author on this report, "so, it is very interesting to discover that persistent phospho-tau increases also appear to be part of earlier phases of blast-induced neurotrauma".

These new findings raise the possibility that early-intervention with tau-based treatments may someday prove valuable in treating blast-induced neurotrauma.

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