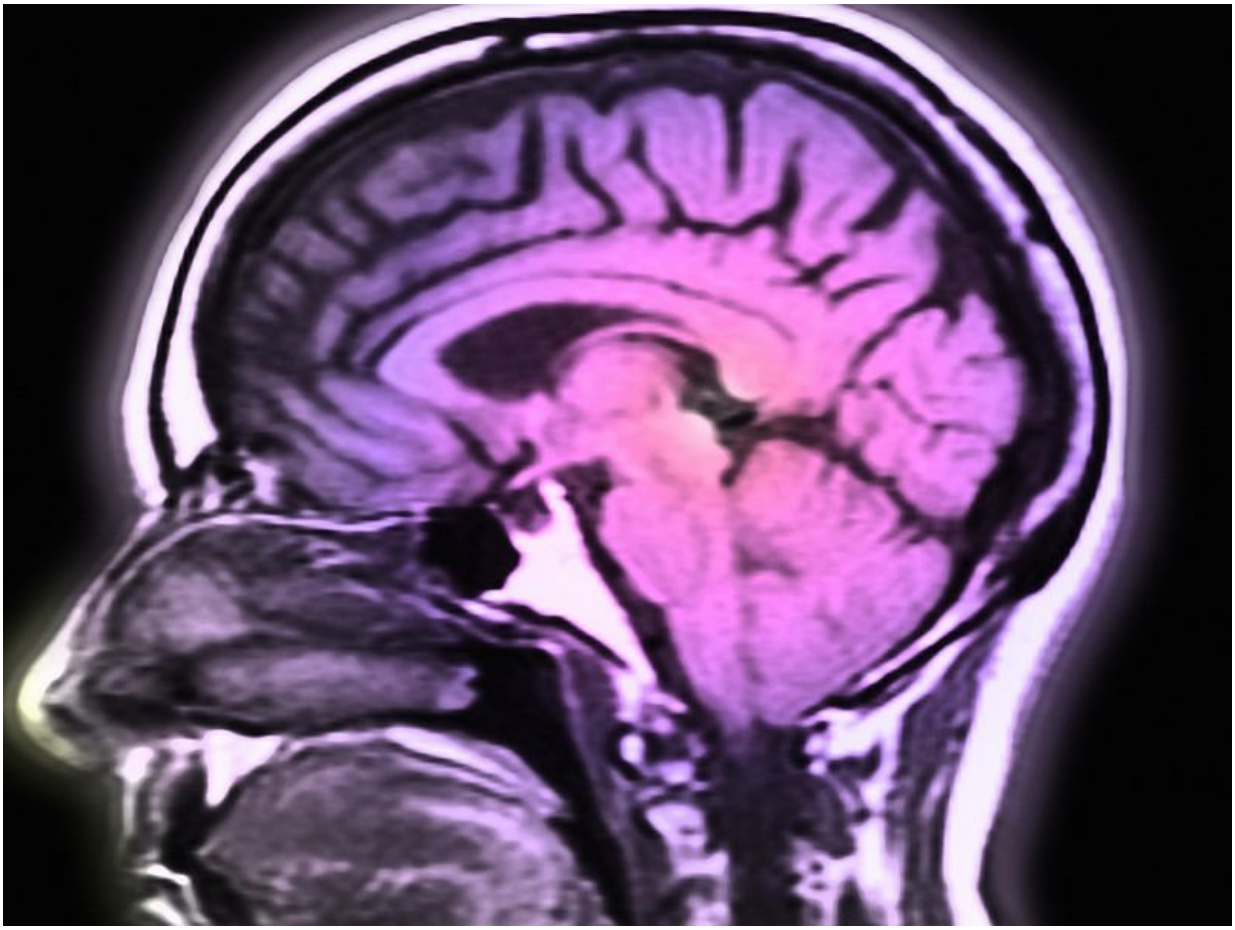
Closed-head injury may induce TBI even if no concussive Sx

January 23 2018



(HealthDay)—Closed-head impact injuries can induce pathologic

traumatic brain injury, independent of concussive signs, according to a study published online Jan. 18 in *Brain*.

Chad A. Tagge, from the Boston University School of Medicine, and colleagues examined post-mortem brains from teenage athletes in the subacute period after mild closed-head impact injury. A mouse model of lateral closed-head impact injury that uses momentum transfer to induce traumatic head acceleration was developed to examine causal mechanisms.

The researchers note that astrocytosis, myelinated axonopathy, microvascular injury, perivascular neuroinflammation, and phosphorylated tau protein pathology were found in the post-mortem brains. Abrupt onset, transient course, and rapid resolution of a concussion-like syndrome characterized by altered arousal, contralateral hemiparesis, truncal ataxia, locomotor and balance impairments, and neurobehavioral deficits was exhibited in unanesthesetized mice subjected to unilateral impact. There was a correlation for experimental impact injury with axonopathy, blood-brain barrier disruption, astrocytosis, microgliosis, monocyte infiltration, and phosphorylated tauopathy in cerebral cortex ipsilateral and subjacent to impact. Concussion-like deficits occurred after impact injury but not after blast exposure under experimental conditions. Compared with blast exposure, impact injury generated focal point loading on the head and seven-fold greater peak shear stress in the brain.

"These results indicate that closed-head impact injuries, independent of concussive signs, can induce traumatic brain injury as well as early pathologies and functional sequelae associated with chronic traumatic encephalopathy," the authors write.

More information: Abstract/Full Text