



## **Inflammatory changes in optic nerve after closed-head repeated traumatic brain injury: Preliminary study.**

### **Purpose**

To investigate if inflammatory and degenerative changes following repeated mTBI (r-mTBI) may be present in htau mice, a transgenic mouse in which the non-mutated human tau gene is expressed on a null murine tau background.

### **Participants**

Young (15 weeks) and old (65-70 weeks) mice

### **How was the study conducted?**

Optic nerve neuropathic changes (cellularity, myelin content and astroglial reactivity) in the mice 24 hours after r-mTBI when compared to anesthesia only sham controls (r-sham).

### **Findings**

Increased cellularity and areas of demyelination were clearly detectable in the intracranial portion of the optic nerve in both young (10–15 weeks) and old (65–75) htau r-mTBI mice at 24 hours post-injury, in contrast to r-sham. Increased astroglial reactivity was also observed, together with increased tau phosphorylation. Localized inflammatory and degenerative response of the intracranial part of the optic nerve was detected in htau mice after r-mTBI. Further studies to clarify the cause and consequences of this phenomenon are warranted.

### **Military Impact**

If eventually confirmed in humans, these findings may potentially lead to better methods of determining the causes and consequences of mild repetitive brain injury.

*Tzekov R, Phifer J, Myers A, Mouzon B, Crawford F. Inflammatory changes in optic nerve after closed-head repeated traumatic brain injury: Preliminary study. Brain injury. 2016 Oct 14;30(12):1428-35.*