TITLE:

Model Development And Mechanistic Studies Of Post Traumatic Epilepsy Associated With Repetitive Blast Exposure

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RESEARCH PROJECT DESCRIPTION (brief overview of background, hypothesis, methods, role of medical student, funding and relevant publications -- SHOULD NOT EXCEED ~ 250 WORDS)

Symptomatic epilepsy is epilepsy with a known cause that precipitates the chronic epilepsy period, typically characterized by two or more unprovoked spontaneous recurring seizures (SRS). Post-traumatic epilepsy (PTE) is a type of symptomatic epilepsy resulting from traumatic brain injury (TBI). In the civilian population, PTE accounts for 5% of all epilepsy and over 20% of symptomatic epilepsy. In the military population, it was shown between World War I through Middle East conflicts in the 1980s that 34-50% of soldiers with penetrating head injury developed PTE within 5-15 years. However, very little is known about the incidence of PTE associated with blast-induced TBI, especially repetitive exposure. Thus, with increased frequency of TBI from exposure to blast due to improvised explosive devices in current global conflicts and increased survivability associated with better body armor, it is important to start closing this knowledge gap. Hypothesis: PTE is associated with exposure to repetitive blast. Utilizing an Advanced Blast Laboratory Simulator, rodents will be exposed to mild to moderate blast overpressure daily for 3-5 days. Since the development of epilepsy in conjunction with TBI can take months to years, we will use a test for seizure susceptibility that predicts the development of epileptogenesis. The pentylenetetrazol (PTZ) test for seizure susceptibility will be employed at several time points following exposure to repetitive blast. The role of the medical student will be to assist in the repetitive blast and PTZ seizure susceptibility experiments. This study will be funded by the Department of Anesthesiology.