



Abstract

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Project Title: THE EFFECT OF APOE ON OUTCOMES IN TBI ADULTS

Abstract: *DESCRIPTION (As Adapted from the Investigator's Abstract): Mortality and morbidity of patients following a traumatic brain injury (TBI) remain extremely high. TBI induces neuronal injury as evidenced by a misalignment and compaction of the neurofilaments and dispersion of the microtubules within the axon that effect neurotransmission. Apolipoprotein E (ApoE) is responsible for the transportation of lipids within the brain, assists in neurotransmission and maintains the structural integrity of the microtubule within the neuron. The genotype for ApoE (APOE) has been linked to microtubule regeneration and permeability within the neuron contributing to brain edema, which plays a major role in outcomes after TBI. We hypothesize that individuals with the APOE4 allele will have greater difficulty in rebuilding microtubules as compared to those without APOE4 alleles and this difference will be observed by clinical manifestations of decreased flow, metabolism and altered neurotransmission. Thus, the purpose of this study is to examine APOE genotype and its relationship to the cerebrovascular, metabolic and neurotransmitter responses and functional outcomes following a TBI. The research questions are: 1) Is there a difference in the intracranial pressure (ICP), cerebral perfusion pressure, cerebral blood flow, arterial-jugular venous oxygen difference, arterial-jugular venous glucose difference, cerebral oxygen metabolism and lactate/pyruvate ratio during the first 5 days following TBI between patients with and without APOE4 alleles while controlling for intensity of ICP therapy? 2) Is there a difference in aspartate and glutamate levels in the cerebrospinal fluid during the first 5 days following TBI between those patients with and without APOE4 alleles? 3) Is there a difference in the functional outcomes (mortality, and neuropsychologic evaluation measured using the Glasgow Outcome Scale, Disability Rating Scale and the*

Neurobehavioral rating scale) at 3 and 6 months after TBI between patients with and without APOE4 alleles? If the hypotheses are supported and there are genetic differences in the brain's tissue metabolism and blood flow response following TBI that impact on outcomes, the results could lead to a new vista of nursing, medical and pharmacologic therapies.

Thesaurus Terms:

*apolipoprotein E, brain injury, functional ability, genotype, trauma allele, aspartate, brain circulation, brain metabolism, cerebrospinal fluid, genetic susceptibility, glutamate, intracranial pressure, longitudinal human study, neural transmission, oxygen consumption
adult human (19+), clinical research, human subject, neuropsychological test*

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