Workshop Presentation

Animal Models of Traumatic Brain Injury

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Abstract

Traumatic brain injury (TBI) leads to tissue damage by primary and secondary mechanisms. Several factors such as location, nature and severity of the primary injury, age, health, sex, medication, alcohol and drug use, and genetics influence the pathophysiology of TBI in clinic, so TBI is a heterogeneous event and consequently, TBI modeling faces some difficulties. In the fluid percussion injury model, a fluid pressure pulse is generated to the intact dura through a craniotomy and produces a combination of focal and diffuse neuronal injury. The controlled cortical impact injury model uses a pneumatic or electromagnetic impact device to drive a rigid impactor onto the intact dura and creates tissue loss, haematoma, axonal injury and concussion. In the penetrating ballistic-like brain injury, projectiles are transmitted with high energy to produce a cavity in a defined area of the brain. In the weight-drop model, a weight falls from specified height. In the blast brain injury model, trauma can be caused by the primary injury related to the blast. By choosing a proper animal model, we can address the biomechanical aspects of brain injury and assess the potential treatments.

Keywords: Traumatic Brain Injury, Animal Models.

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