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Workshop Presentation

A New Animal Model of Traumatic Brain Injury in Rat

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Abstract

This study was designed to develop a modified TBI weight drop model for induction of focal mild cerebral injury. A stereotaxic coupled weight drop device was designed. Principle arm of device carries up to 500g weights which their force was conveyed to animal skull through a thin nail like metal tip. To determine the optimal configuration of the device to induce mild TBI, six different trials were designed. The optimal configuration of the instrument was used for evaluation of behavioral, histopathological and molecular changes of mild TBI. Histological studies revealed a remarkable increase in the number of dark neurons in trauma site. TBI increased the expression of apoptotic proteins, Bax, Bcl2 and cleaved caspase-3 in the hippocampus. Our designed TBI device is capable to produce variable severity of TBI from mild to severe. The main advantage of the new TBI model is induction of mild local unilateral brain injury instead of traumatization of the whole brain. This model does not require craniotomy for induction of brain injury. This novel animal TBI model mimics human mild focal brain injury. This model is suitable for evaluation of pathophysiology as well as screening of new therapies for mild TBI. Details of this study were published (Ghadiri, et al. 2014).

Keywords: Mild TBI, Animal Model, Unilateral Brain Injury, Rats.

References

Ghadiri T, Sharifzadeh M, Khodaghali F, Modarres Mousavi SM, Hassanzadeh G, Zarrindast MR, et al. A novel traumatic brain injury model for induction of mild brain injury in rats. J Neurosci Methods. 2014; 15(233): 18-27.

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