A Systematic Review of Closed Head Injury Models of Mild Traumatic Brain Injury in Rodents

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Abstracts will be considered for both poster and platform presentations

Neurotrauma (TBI, spinal cord injury, etc.)

Mild TBI (mTBI) is a significant health concern. Animal models of mTBI are essential for understanding mechanisms, and pathological outcomes, as well as to test therapeutic interventions. A variety of closed head models of mTBI that incorporate different aspects (i.e., biomechanics) of the mTBI have been reported. The purpose of the current review was to compile a comprehensive list of the closed head mTBI rodent models, along with the common data elements, and outcomes, with the goal to summarize the current state of the field. Publications were identified from a search of PubMed and Web of Science and screened for eligibility following PRISMA guidelines. Papers were included that were closed head injuries in which the author's classified the injury as 'mild' in rats or mice. Injury model and animal-specific common data elements, as well as behavioral and histological outcomes, were collected and compiled from a total of 402 articles. Our results outline the wide variety of methods used to model mTBI. We also discovered that female rodents and both young and aged animals are underrepresented in experimental mTBI studies. Our findings will aid in providing context comparing the injury models and provide a starting point for the selection of the most appropriate model of mTBI to address a specific hypothesis. We believe this review will be a useful starting place for determining what has been done and what knowledge is missing in the field to reduce the burden of mTBI.

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