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A new experimental protocol for hemorrhage research using traumatic brain injury animal model induced by controlled cortical impact

Youngmin Bu, Hyejin Joo, Jinhyun Bae, Yumi Bang, Junseon Lee, Byoung Dae Lee, Beomjun Lee, Jaewoo Park and Kyungjin Lee
KyungHee University, South Korea

To date, the targets in TBI researches might be neuronal cell focused targets including neuronal apoptosis, neuroinflammation. Whereas, another important phenomenon might be cerebral hemorrhage (Hrr) which, by itself, adversely affects the cerebral vasculature and neurons by deleterious mechanisms and formed space occupying hematoma. However, there has been few researches about those. Therefore, in the current study, we'd like to suggest new protocol for the evaluation of hrr in TBI model. Controlled cortical impact induced TBI model was induced by impactor (Leica) with the set condition. Mice was fixed with transcranial perfusion at 1, 3, 5 and 7 days after TBI. Mice head was decapitated and post-fixed for 24 hours. Brain was then isolated with the skull remained and post-fixed again for 24 hours. Hrr was measured by image J (NIH) after taking photos in the middle of brain slicing using Cryocut. Hemorrhage was occurred simultaneously with impact and located parietal cortex and the surrounding-area of hippocampus. The color of the Hrr was bright red before 3rd day, but it turns to dark red color and formed hematoma after 3rd day. In addition, hemorrhage reached peaked at 3rd day and then gradually decreased to normal range on the 7th day. We found that one natural compound of herbal medicine increases the blood clearance at five days after TBI. In conclusion, the current method might be useful to investigate Hrr-related pathological or pharmacological researches in the field of TBI.

ymbu@khu.ac.kr

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