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Poster Presentation

Neuroprotective Effect of Estrogen against Brain Edema and Blood Brain Barrier Disruption: Roles of Estrogen Receptors α and β

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Abstract

Estrogen (E_2) has neuroprotective effects on blood-brain-barrier (BBB) after traumatic brain injury (TBI). In order to investigate the roles of estrogen receptors (ERs) in these kind of effects, ER-α antagonist (MPP) and, ER-β antagonist (PHTPP), or non-selective estrogen receptors antagonist (ICI 182780) were administered as regulators of CNS cytokines levels and neuroinflammation after TBI. MPP (150 µg/Kg), PHTPP (150 µg/Kg) or ICI_{182780} (4 mg/kg) was injecteddaily 48hr before TBI, then E_2 (33.3µg/Kg) or oil were administered 30 min after TBI. BBB disruption (Evans blue content) and brain edema (brain water content) were evaluated 5hr and 24hr after the TBI, respectively. Brain levels of anti-inflammatory (IL-10 and IL-1ra) and proinflammatory (IL-1β, IL-6, and TNF-α) cytokines were quantified 24hr after TBI induced by Marmarou's method. Results revealed that, in the presence of each selective estrogen receptor antagonist there was a significant increase of IL-10 and significant decrease of IL-1β, IL-6, and TNF-α 24hr after TBI but there is no significant differences between the results of combined use of selective receptor antagonists and the non-selective one. Taken together, these studies identified a dramatic cytokine-mediated neuroinflammatory response that is regulated through both ER-α and ER-β receptors. This may suggest a therapeutic potential in the brain trauma for ER-specific agonists.

Keywords ER-α Agonist, ER-β Agonist, Cytokines, Neuroinflammation, Estrogen.

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