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Development and progression of Alzheimer's disease in Sprague-Dawley rats administered with streptozotocin intrahippocampal

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Various animal models have been used to represent Alzheimer's disease (AD) in the quest to develop new treatment and to better understand the disease. The ideal AD model should mimic the pathological aspects of human AD. Streptozotocin (STZ), is a common compound injected intracerebroventrally to induce sporadic AD. However, the hippocampus holds a large amount of insulin receptors (IRs) which are very sensitive to STZ. Thus, the present study was conducted to investigate the effects of intrahippocampal (IH) STZ administration on memory impairment and formation of amyloid β (Aβ) at 3, 6 and 12 weeks post STZ-treatment. Sixty male Sprague-Dawley rats (350-450 g) were divided into groups of control (no treatment), sham-operated (received PBS) and IH-STZ treated (G3w, G6w and G12w). STZ (3 mg/kg; 5 µl) was administered bilaterally as a single injection into the dorsal hippocampus of the rats. The memory impairment was studied using Morris water maze test a week before sacrifice. The rats were sacrificed at week 3, 6 and 12 after STZ administration and present of Aβ plaques was identified using immunohistochemistry technique. All IH-STZ rats showed significant result in escape latency, total distance travelled and swimming speed ($p<0.05$) when compared to sham indicating memory impairment. In conclusion, STZ injected intrahippocampally developed memory impairment as early as two weeks after STZ treatment.

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