

## Effect of castration on memory impairment of Alzheimer disease in mature male rats

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**Background and Aims:** Several studies indicate that steroidal sex hormones have a protective effect in neurodegenerative events such as Alzheimer Disease (AD). The present study was designed to explore effect of testosterone in memory impairment induced by intra-cerebroventricular (icv) injection of streptozptocin (STZ) as a model of sporadic AD.

**Methods:** Study was carried out on male Wistar rats. Animals were divided randomly into 9 equal groups. Experimental model of AD was induced by icv injection of STZ at the dose of 3 mg/kg on day 1 and 3. STZ-induced memory impairment was assessed two weeks after the last dose of STZ by using a passive avoidance task (1 mA, 50 HZ for 3 seconds). The interval between the placement of animals in the illuminated chamber and the entry into the dark chamber was measured as a step-through latency (STL). Castration was performed by surgical removing of testis and behavioral study of memory impairment was done after 4 weeks.

**Results:** Results of this study showed that icv injection of STZ could induce marked ( $p < 0.05$ ) memory impairment at the dose of 3 mg/kg. Therefore, we used this dose of STZ for induction of experimental model of AD. Memory was worsened in castrated rats ( $P < 0.05$ ) when compared with normal and sham-operated animals. Testosterone replacement therapy (1 mg/kg, s.c, for 6 days) in 4 week castrated rats restored memory up to the level of control groups.

**Conclusions:** According to the obtained results it can be concluded that testosterone improves cognitive and memory impairment of AD. We suggest that testosterone replacement therapy may have beneficial effect in ameliorating memory impairments of senile patients suffering from AD. Further clinical studies should be carried out to prove possible useful effect of testosterone as an adjuvant therapy in AD.

**Keywords:** Memory impairment; Castration; Alzheimer disease; Passive avoidance task