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Effects of muscarinic receptors blocking on recovery of tacrine-loaded magnetic chitosan in brain damaged Rat by stz

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Objective: Alzheimer's disease is a progressive neurodegenerative disease with impairment of memory and cognition is apparent. Important changes are central cholinergic system deficits, presynaptic cholinergic neurodegeneration in forebrain, cholinergic transmission deficiency in the cerebral cortex and hippocampus. Relationship between cholinergic dysfunction and disease is a logical reason for the use of tacrine as a choline esterase. In this study because of the probable effects of tacrine on muscarinic receptors in new shape of drugs, the effects of receptor blocking by stz injection into the cerebral ventricles were measured in Alzheimer's disease model.

Methods: Stz injection into the cerebral ventricles with 48 hours interval and intravenous injection tacrine-loaded magnetic chitosan were done. Then an appropriate magnet (400 G) was placed to the animal's head for an hour. To muscarinic receptors blocking intra peritoneal scopolamine injection was used. Tests used in these experiments were Morris water maze (spatial memory assessment), Real time-PCR (gene expression levels of app and seladin-1, TUNEL staining (apoptotic cells).

Results: Tacrine-loaded magnetic chitosan in brain-damaged rat by stz improved spatial memory, increased the level of seladin-1 gene expression and decreased app gene expression and cell apoptosis. Injection of this drug with scopolamine produced the opposite effect.

Conclusion: Tacrine-loaded magnetic chitosan through muscarinic receptors signaling pathway improves its recovery affects in Alzheimer's rat models.

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