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Effect of some psychoactive agents on memory in rats with regard to aluminum-induced dementia

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Alzheimer's disease (AD) is a chronic, progressive, neurodegenerative disorder of the brain. AD is the most common type of dementia. The major histopathological features of AD are neuritic (or 'senile') plaques, neurofibrillary tangles, and a loss of neurons and synapses. The degeneration of cholinergic neuronal systems, in particular those projecting from the basal forebrain to the hippocampus and cerebral cortex, is a consistent feature in the neuropathology of AD. These systems play an intrinsic role in learning and memory processes and the degree of cholinergic degeneration has been shown to correlate with the loss of cognitive function. Memory deficit is not a unitary phenomenon in AD. Up to 90% of patients with dementia develop significant behavioral problems during the course of their illness. Behavioral and psychiatric symptoms as delusions, hallucinations or agitation develop in as many as 60% of community-dwelling dementia patients. The term "behavioral and psychological symptoms of dementia" (BPSD) has been proposed to describe the spectrum of non-cognitive manifestations of dementia. Antipsychotics are frequently added to anti-Alzheimer's therapy to control BPSD, Haloperidol and risperidone are typical and atypical antipsychotics, respectively. Here we are interested in studying the behavioral effects of these antipsychotic agents in rats with AD disease, and their influence during treatment of these rats with memantine, a NMDA receptor blocker used in management of AD.

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Design, formulation and *in vitro* characterization of Irbesartan solid self-nanoemulsifying drug delivery system (S-SNEDDS) prepared using spray drying technique

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In this study, a novel liquid SNEDDS containing Irbesartan was formulated and further developed into a solid form by spray drying technique using Aerosil 200 as solid carrier. Results showed that the mean droplet size of all reconstituted SNEDDS was found to be in the nanometric range with optimum PDI values. All formulae also showed rapid emulsification time, good optical clarity and high drug content; and were found to be highly stable. Transmission electron microscopic images showed the formation of spherical and homogeneous droplets with a size smaller than 50 nm, which satisfies the criteria of nanometric size range required for nanoemulsifying formulae. *In vitro* release of IRB from SNEDDS formulae showed more than 99% of IRB release in approximately 90 minutes. Optimized SNEDDS formulae with the smallest particle size, rapid emulsification time, best optical clarity and maximum drug content and rapid *in vitro* release were selected to be developed into solid self-nanoemulsifying drug delivery system (S-SNEDDS) using spray drying technique. The prepared S-SNEDDS formulae were evaluated for flow properties, differential scanning calorimetry (DSC), scanning electron microscopy (SEM), reconstitution properties, drug content and *in vitro* dissolution study. Reconstitution properties of S-SNEDDS showed spontaneous self-nanoemulsification and no sign of phase separation. DSC thermograms revealed that IRB was in solubilized form and FTIR supported these findings. SEM photographs showed smooth uniform surface of S-SNEDDS with less aggregation. Results of the *in vitro* drug release showed that there was great enhancement in dissolution rate of IRB.

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