

Giobal Pharma Summit August 10-12, 2015 Philadelphia, USA

Protective effect of adenosine A1 agonists against pentylenetetrazole-induced convulsions

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Aim: Pentylenetetrazol (PTZ) is a commonly employed chemoconvulsant, used for screening drugs for anti-convulsant activity. The present study is aimed at investigating the differential effects of adenosine and the adenosine A1 agonist, N6-Cyclopentyladenosine (CPA) against seizures induced by pentylenetetrazole (PTZ).

Methods: This study was carried out by investigating the effect of pretreatment of rats with adenosine and CPA on pentylenetetrazoleinduced seizures. Acute toxicity of PTZ in rats was studied by determination of median convulsive dose (CD50) of PTZ alone and after pretreatment of rats with each of adenosine and CPA.

Results: Adenosine, when administered to rats i.p in a dose of 1000 mg/kg, 5 minutes prior to acute challenge with PTZ in a dose of 60 mg/kg, produced significant protection against PTZ-induced seizures. CPA, when administered i.p to rats in a dose of 10 mg/kg, 60 minutes prior to acute challenge with PTZ in a dose of 60 mg/kg, also showed significant protection against PTZ-induced seizures.

Conclusion: CPA significantly protected against seizures after acute PTZ administration and this indicates that the anti-convulsant effect of PTZ is via stimulation of A1 receptors.

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Development and characterization of lipid nanocarriers for spironolactone delivery: A comparative study of solid lipid nanoparticles (SLN) and nanostructured lipid carriers (NLC)

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Spironolactoe (SP) is a poorly water-soluble drug and oral intake as main route of this drug is reported to be associated with low and variable bioavailability and side-effects. SLN and NLCare colloidal carrier systems providing enhance and control drug bioavailability of some drugs. Regarding to the good solubility of SP in lipid materials, SLN and NLC seemed to be an excellent ways to overcome these issues. The SP loaded NLC with Compritol 888 ATO as solid lipid and different Oleic Acid (OA) as liquid lipid content and SLN without OA were prepared by probe ultrasonication method. The average size of the NLC decreased with increase the concentration of OA. All zeta potential of obtained formulations increased dramatically from -13.6 to -35.1 mV by increasing the OA content of nanoparticles. The drug entrapment efficiency with increasing the percentage of OA from 0 to 30 wt% in SLN/NLC increased from 77.1 to 90.6%, respectively. Differential Scanning Calorimeter (DSC) measurements indicated that the presence of OA reduced the melting temperature and melting enthalpy of solid lipid in NLC structure. Dissolution of SP-SLN and SP-NLC3 in 0.1M HCl was 4.8 and 6.5 times faster than raw drugs in 240 min respectively. The release of SP from NLC was higher than SLN due to 30% OA in lipid core. These results indicated that the SP loaded NLC containing 70:30 solid lipid to liquid lipid ratio is a suitable carrier of SP with improved drug EE and drug release properties.

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