NEUROPROTECTIVE POTENTIAL OF SOLID LIPID NANOPARTICLES OF SESAMOL: POSSIBLE BRAIN TARGETING STRATEGY

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Objectives:

1. To produce Intracerebroventricular streptozotocin induced cognitive deficit in rats.

2. To assess the effectiveness of sesamol and its nanoformulation against the above mentioned model.

3. To perform behavioral, biochemical and inflammatory experiments.

Methods: Adult male Wistar rats were used. ICV injection of STZ was performed using stereotaxy.Rats were randomly divided into ten groups containing 5-8 animals in each group viz

1: Control animals received an equivalent volume of vehicle for streptozotocin i.e. artificial CSF (ACSF) on day 1 and day 3;

2: animals received intracerebroventricular injection of streptozotocin (ICV-STZ) 3 mg/kg on day 1 and day 3;

3, 4 & 5: ICV-STZ treated rats being administered sesamol (4, 8, 16 mg/kg respectively) for 21 days;

6: ICV-STZ treated rats received unloaded solid lipid nanoparticles (0 mg/kg) for 21 days;

7, 8 & 9: ICV-STZ treated rats were administered solid lipid nanoparticles loaded with sesamol (4, 8 & 16 mg/kg respectively) for 21 days;

10: ICV-STZ treated rats were administered Rivastigmine (1.5 mg/kg) as positive control for 21 days.

Results: SLNs sesamol and plain sesamol (4, 8 and 16 mg/kg) supplementation significantly and dose-dependently improved cognitive impairment, reduced acetylcholinesterase activity, attenuated oxidative-nitrergic stress and inflammatory cytokines in ICV-STZ administered rats. SLNs of sesamol in the dose of 16 mg/kg were found to be most potent in improving all behavioral and biochemical indices and the efficacy was comparable to rivastigmine.

Conclusions: SLNs sesamol could be used as potential therapeutic and brain targeting strategy to combat the global burden of Alzheimer's disease.