



BOOK OF ABSTRACTS

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DESIGN AND CHARACTERIZATION OF GELLAN GUM BASED NASAL MUCOADHESIVE MICROSPHERES OF DONEPEZIL HCl BY SPRAY DRYING TECHNIQUE

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Aim- The aim of this study was to design, develop and evaluate nasal mucoadhesive microspheres of donepezil HCl by using gellan gum as a natural polymer.

Objectives- The major objectives of designing mucoadhesive drug delivery system were to reduce nasal mucociliary clearance of the drug, to improve contact time of drug molecule with nasal mucosa, to increase systemic absorption of a drug candidate and to optimize the formulation based on the various evaluation tests.

Methodology- In the present study spray drying method was used for the formulation of mucoadhesive microspheres, which produces dry powder particles of controllable particle size, shape, form, moisture content and other specific properties irrespective of dryer capacity and heat sensitivity.

Results and Discussion- Drug-Polymer interaction study such as FTIR, DSC and XRD revealed that both the drug and excipients were compatible with each other and no interaction was found in between them. Based on other parameters such as particle size $14.36 \pm 0.25 \mu\text{m}$, production yield $23.75 \pm 0.23\%$, entrapment efficiency $86.48 \pm 2.13\%$, drug loading $35.28 \pm 2.50\%$, mucoadhesion strength $80.30 \pm 2.10 \%$ and swelling index 0.42 ± 0.03 batch G1 was optimized by applying 3^2 full factorial design. Batch G1 showed good results for in-vitro drug release i.e. $93.38 \pm 1.26 \%$ at 240 min and 84.92% drug release for ex-vivo permeation study at 240 min.

Conclusion- Microscopic observations for histological study indicated that the formulation has no significant effect on the microscopic structure of sheep nasal mucosa.

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