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Formulation & *In-vitro* evaluation of mucoadhesive microspheres of Pyridostigmine bromide for intra nasal drug delivery

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Pyridostigmine bromide used for the treatment of Myasthenia Gravis. It is poorly absorbed from GIT and has a less bioavailability of 6-7 % of the administered dose. Hence its bioavailability can be improved by formulating as mucoadhesive microspheres which are administered through intra nasal route. Microspheres were formulated using emulsification solvent evaporation method then we characterized it by FT-IR and SEM. Evaluation has been done for its swelling properties, particle size analysis, entrapment efficiency, drug loading and in-vitro mucoadhesion studies. The suitability of the microspheres for the release of drug studied by in-vitro release at optimum pH. FTIR studies showed that there is no interaction between drug and polymers. The mean particle size of all formulations were in the range of 305.32µm - 366.96µm. The values for entrapment efficiency and drug loading were in the range of 71% to 79% and 7.1 to 7.9% respectively. The in-vitro mucoadhesion studies of all formulations were in range of 82.9 to 99.01 %. The degree of swelling of all the batches were in the range of 1.03 to 1.68. SEM of formulations indicated that the microspheres were discrete, uniform and spherical with a smooth surface. It was evident from the in-vitro dissolution data that all the formulations released more than 80% of drug by 8 hours, with the highest release of 90.62%. From the result it has been deduce that this novel drug delivery system of mucoadhesive microspheres not only prolongs the duration of action but also reduces the frequency of usage.

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