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Formulation development and characterization of selegiline loaded nanoparticles For the effective management of parkinson's disease

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ABSTRACT

Controlled drug release system is one of the most favorable techniques of novel drug delivery system owing to its reproducibility and ease of formulation. Nanotechnology is very useful for controlling the drug release and thus improving the pharmacokinetic and pharmacodynamic properties of the drug. The technique improves patient compliance by reducing both dose and the frequency of administration and thus minimizing the local as well as systemic toxic effects. The aim of the present research work was to formulate and evaluate nanoparticles of Selegiline, an Anti-Parkinson Drug by using the Emulsion solvent evaporation method. Selegiline has a very short half-life of 1.5-3.5 hour with bioavailability oral 10%. Sustained release nanoparticles of Selegiline were prepared to increase the drug residence time in gastrointestinal tract and thus improving the bioavailability of drug. The nanoparticles were prepared by using Chitosan and Carbopol 940 as polymers. Different formulations were prepared with varying concentrations of Chitosan and Carbopol 940 in order to achieve the optimum particle size and maximum encapsulation efficiency. The particle size of nanoparticles was found to be in the range of 0.181±0.051 nm to 0.390±0.101 nm. Drug encapsulation efficiency ranged between 58.1±0.651 percent to 82.9±1.216% with controlled drug release up to 99.29% in phosphate buffer pH 6.8, 12 hrs. FT-IR studies showed that the drug and polymers were compatible. The results of Nanoparticles indicated that optimized formulation exhibited excellent properties.

Keywords: Nanoparticles, Chitosan, Carbopol 940, Selegiline and Emulsion solvent evaporation method.