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Formulation and Evaluation of Methyl Phenidate Sustained Release Tablets

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Abstract

Methyl phenidate is a medication that belongs to the drug class called central nervous system stimulants. Methylphenidate is prescribed for treating narcolepsy (uncontrollable sleepiness), and attention-deficit hyperactivity disorder (ADHD). The aim of the current investigation is to design oral twice a daily sustained release matrix tablets of methylphenidate 20mg, used for the treatment of narcolepsy and ADHD which can release the drug for 10 to 12 hours. The matrix tablets were prepared by the wet granulation method using varying concentrations of sustained release polymers HPMC, Eudragit and Ethyl cellulose. The compatibility of the drug with polymers and other excipients was ruled out by FT-IR studies and found to be compatible. The Methyl phenidate powder and the powder-blends of tablets were evaluated for their physical properties like angle of repose, bulk density and compressibility index and found to be good and satisfactory. The manufactured tablets were evaluated for in process and finished product quality control tests including appearance, dimensions, weight variation, hardness, friability, drug content uniformity, and in vitro drug release. The results of dissolution studies indicated all formulations released up to 12 hours and formulation containing ethyl cellulose (5%) i.e. F7 was the most successful formulation with 96.72% drug release at the end of 12 hours. Based on mathematical models the formulation F7 fitted into zero order and Korsmeyer-Peppas plot with 0.942 and 0.999 regression values respectively and show Fickian diffusion mechanism release.

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Keywords

Methyl phenidate, Sustain release tablets, In-vitro dissolution study.

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