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FORMULATION DEVELOPMENT AND INVITRO EVOLUTION OF SUSTAINED RELEASE VERAPAMIL HCL MATRIX RELEASE TABLETS BY USING DIFFERENT NATURAL POLYMERS

Santhoshi, Ekshitha.G, Rajkiran.K
Department of Pharmaceutics, Sri Sivani College of Pharmacy, India

Abstract

Various natural polymers will be used in the formulation and evaluation of the sustained release (SR) matrix tablets of Verapamil Hydrochloride (HCl) in this study to provide controlled drug release over a longer period of time. Verapamil HCl, a calcium channel blocker with a short half-life, requires frequent dosing, which can be overcome by developing sustained release formulations. Due to their biocompatibility, non-toxicity, and capacity to regulate drug release, natural polymers like Okra gum, Xanthan gum, and Guar gum were chosen as matrix-forming agents. The sustained release matrix tablets were prepared using the wet granulation method and subjected to various pre-compression and post-compression evaluation parameters, including flow properties, hardness, friability, weight variation, drug content, and swelling index. In-vitro drug release studies were conducted using USP dissolution apparatus in 0.1N HCl and phosphate buffer pH 7.4 to simulate gastrointestinal conditions.The results revealed that formulations containing Okra gum and Xanthan gum in optimized concentrations showed sustained drug release up to 12 hours with controlled swelling behavior, adhering to zero-order and Higuchi kinetics, suggesting diffusion as the primary mechanism of release. Among all formulations, the combination of natural polymers provided a synergistic effect, significantly retarding drug release compared to single polymer systems.The study came to the conclusion that natural polymers are promising excipients for the development of Verapamil HCl sustained release matrix tablets because they provide advantages such as decreased dosing frequency, increased patient compliance, and pharmacokinetic profiles that are predictable.

Keywords: Verapamil Hydrochloride, Sustained Release, Natural Polymers, Okra Gum, Xanthan Gum, Guar Gum, Matrix Tablets, Controlled Drug Delivery, In-vitro Evaluation, Release Kinetics.

Biography

Santhoshi has her own experience in valuation and passion for ML and data. The research team built this model after many years of experience in research, evaluation, work in both hospitals and scientific laboratories. This approach meets all the requirements for precise, specific, sensitive diagnostics.

santhoshiclinical34@gmail.com

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