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Development, Characterization and Pharmacokinetics of Olmesartan-loaded Solid Lipid Nanoparticles

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Drugs with low aqueous solubility not only give low oral bioavailability but provide high inter-and intra-subject variability. Solid lipid nanoparticles (SLN) have gained much interest as potential drug carriers for lipophilic drugs. Olmesartan medoxomil (OLM) belongs to Class II drugs under Biopharmaceutical Classification Systems. The objective of the present study was to optimize and investigate the release kinetics of OLM loaded SLN formulations in order to ascertain the potential of SLN as a delivery system. Olmesartan medoxomil loaded solid lipid nanoparticles was prepared by hot homogenization and ultra-sonication method. Particle sizes, polydispersity index, were used to characterize the formulations. Fourier transform infrared spectroscopy (FTIR) and differential scanning colorimetry (DSC) analyzes were carried out on the pure drug, excipients and SLN formulations. The drug content and entrapment efficiency in the formulations were determined.. The drug release kinetics data of the formulations were analyzed using different kinetics models. The results showed the particle size range of 122.8-135.0 nm, and polydispersity index range of 0.208-0.239. The entrapment efficiency was in range of 94.5-96.8 %. FTIR spectroscopy showed no chemical nteraction between drug and the excipients. The in-vitro drug release study demonstrated that drug-loaded formulations gave higher drug release than olmesartan medoxomil.

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