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ABSTRACT BOOK

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Formulation and Evaluation of Solid Lipid Nanoparticles for Solubility and Permeability Enhancement of Diuretic Drug

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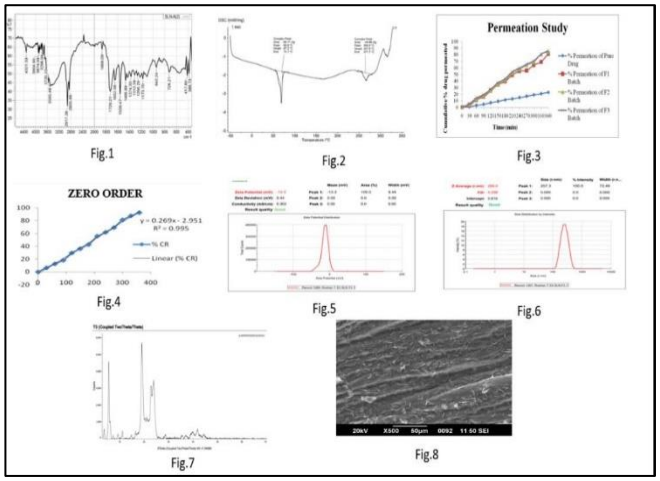
Keywords: Solid lipid nanoparticles, diuretic, microemulsion, solubility, permeability.

Aim and Objectives: The present investigation was aimed at formulating and evaluating the solid lipid nanoparticles for solubility and permeability enhancement of diuretic drug having low aqueous solubility and permeability.

Methodology: The solid lipid nanoparticles were prepared by using microemulsion method and were further evaluated for physicochemical characteristics such as % drug content, % entrapment efficiency, % drug loading, particle size, zeta potential, polydispersity index (PDI), % drug release and permeation study. Optimized batch was selected based on the obtained results and was subjected to FTIR study, differential scanning colorimetry (DSC), X-ray diffraction (XRD) and scanning electron microscopy (SEM) study.

Results and Discussion: The FTIR (Fig.1) and DSC study (Fig.2) showed that there is no interaction between drug and excipients. The % drug content, % entrapment efficiency, % drug release, % drug permeation (Fig.3), flux and permeability coefficient for optimized batch was found to be 94.75%, 90.52%, 92 . 43 % and 86 . 24 %, 166 . 14 µg/cm2h and 83 . 07 cm/ h respectively. The drug release was observed to follow zero order kinetics (Fig.4). The average particle size, zeta potential (Fig.5) and PDI (Fig.6) for optimized formulation was found to be 285nm, 13.3mV and 0.298 respectively. XRD study (Fig.7) indicated drug conversion into amorphous form. SEM (Fig.8) showed slightly irregular shape with a smooth surface and no crystal or aggregation of nanoparticles.



Conclusion: From the findings it is concluded that, prepared solid lipid nanoparticles enhanced solubility as well as permeability of poorly soluble diuretic drug Hydrochlorothiazide

References:

1. EI-Gizawy SA, El-Maghraby GM, Hedaya AA. Formulation of acyclovir-loaded solid lipid nanoparticles: design, optimization, and in-vitro characterization. Pharm Dev Technol. 2019; 24(10):1287-98.
2. Reddy AP, Parthiban S, Vikneswari A, Senthilkumar GP. A modern review on solid lipid nanoparticles as novel controlled drug delivery system. Int J Res Pharm Nano Sci. 2014; 3:313-25.
3. Mokale V, Khatumaria B, Verma U, Shimpi N, Naik J, Mishra S. Formulation and development of nanoparticles for quick and complete release of hydrochlorothiazide by nanonization technique. Micro Nanosyst. 2016; 6:109-17.

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