Formulation and Evaluation of Metoclopramide Solid Lipid Nanoparticles for Rectal Suppository

Radwa A. Mohamed, Haidy A. Abass, Mohamed A. Attia, Ola A. Heikal

Abstract:

Objectives: The purpose of this study was to formulate and characterize metoclopramide solid lipid nanoparticles (MCP-SLNs) and incorporating it into suppository bases for treatment of nausea and vomiting, produced with chemotherapeutic agents, using one dose per day. Methods: MCP-SLNs was prepared using high shear homogenization (hot homogenization) technique using different surfactants (tween 80, poloxamer 407, poloxamer 188 and cremophore) in two different concentrations (2.5% and 5%) then solid lipid nanoparticle (SLN), whose release percentage above 50%, was incorporated into suppository for treatment of nausea and vomiting. The prepared SLN and suppositories were then evaluated and characterized. Key findings: Formulation of poloxamer 407 with compritol and drug (F9) produced highest in-vitro % release (80%). Transmission electron microscopy showed that SLN had round and spherical shape in form of solid dispersion or drug-enriched core. Particle size analysis of SLN showed a size range of 24.99–396.8 nm. Negative zeta potential proves complete drug entrapment. In-vivo study of MCP-SLN suppositories produced the same %GE as the market metoclopramide (MCP) suppository (Primperan) with sustained release effect. Conclusion: MCP-SLN suppositories (formula F) can reverse decrease in %GE because of emesis with sustained release effect. So it succeeded to be an alternative to MCP suppositories with no multiple dosing.

Published In: