Optimization and Characterization of Primaquine Loaded Solid Lipid Nanoparticles (SLN) For Liver Schinonticide Targeting By Freeze Drying

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Abstract

The aim of this study was preparation of a liver schinonticide Primaquine phosphate (PQ) directly to the hepatocytes using solid lipid nanoparticles (SLN). The PQloaded solid lipid nanoparticles (PQ-SLNs) were prepared by a modified solvent emulsification evaporation method based on a water-in-oil-in-water (w/o/w) double emulsion and dried freeze drying (PQ-SLNFD) to obtain the nanoparticles. The mean particle size, zeta potential, drug loading, and encapsulation efficiency of the PQSLNFD were 236nm, +23 mV, 14%, and 75%, respectively. A spherical morphology of PQ-SLNFD was seen by scanning electron microscope had traces of drug crystals.

In vitro, release profile depicted a steady drug release over 400 hours for PQ-SLNFD. Differential scanning calorimeter thermograms demonstrated presence of drug in drug-loaded nanoparticles along with disappearance of decomposition exotherms, suggesting increased physical stability of drug in prepared formulations. The nanoformulated PQ was 20% more effective as compared with conventional oral dose when tested in Plasmodium berghei-infected Swiss albino mice. This study established an effective process of developing a nanomedicine delivery system for PQ.

Keywords: double emulsion, solid lipid nanoparticles, freeze dried

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