Bulletin of Pharmaceutical Research 2011;1(2):10-4
An Official Publication of Association of Pharmacy Professionals
ISSN: 2249-6041 (Print)

RESEARCH ARTICLE

IN VIVO ASSESSMENT OF ATORVASTATIN NANOEMULSION FORMULATION

Rajendra Chouksey[1]*, Anand Kumar Jain[2], Harish Pandey[3] and Ankur Maithil[3]

[1]*Department of Pharmaceutics, School of Pharmacy, Gyan Vihar University, Jaipur-302 017, Rajasthan, India*
[2]*Department of Pharmacy, Gajaraja Medical College, Gwalior-474 006, Madhya Pradesh, India*
[3]*Department of Pharmaceutics, Sri Satya Sai College of Pharmacy, Sehore-466 001, Madhya Pradesh, India*

**E-mails*: chouksey_rajendra@yahoo.com
Tel.: +91-9993815318

Received: June 30, 2011 / Revised: July 22, 2011 / Accepted: July 25, 2011

Atorvastatin is one of the most important hypolipidemic drug available today and circumventing the major problem of its poor bioavailability remains a big challenge to pharmaceutical scientists. The objective of the present study was to carry out pharmacokinetic studies of nanoemulsion formulation of atorvastatin (AT) in order to assess the *in vivo* performance of developed formulation. Optimized formulation was selected for *in vivo* study on the basis of higher drug release, optimum globule size, minimum polydispersity value, lower viscosity, and overall lower surfactant and co-surfactant concentration and exhibited better bioavailability as compared to pure drug.

Key words: Nanoemulsion, Atorvastatin, *In vivo* studies, Bioavailability.

INTRODUCTION

Nanoemulsions being colloidal nanodispersions of oil in water (or water in oil), thermodynamically stabilized by an interfacial film of surfactant(s) and co-surfactant(s) have revealed tremendous potential in nanoengineering of various inorganic materials (Date and Patravale, 2004). Droplet size in thermodynamically stable nanoemulsions is usually 10-100 nm (Sintov and Shapiro, 2004). The homogeneous systems that can be prepared over a wide range of surfactant concentrations and oil to water ratios (1:4) are all fluids of low viscosity. Nanoemulsion provides ultra low interfacial tension and large *o/w* interfacial areas. Nanoemulsions have a higher solubilization capacity than simple micellar solutions and their thermodynamic stability offers advantages over unstable dispersions, such as emulsions and suspensions, because they can be manufactured with little energy input (low energy emulsification techniques/heat or mixing) and has a long shelf life. The nanosized droplets leading to enormous interfacial areas associated with nanoemulsions would influence the transport properties of the drug, an important factor in sustained and targeted drug delivery (Swarbrick and Boylan, 1994). The attraction of *o/w* nanoemulsion systems lies in their ability to incorporate hydrophobic drugs into the oil phase thereby enhancing their solubility. Nanoemulsions have been reported to make the plasma concentration profiles and bioavailability of drugs more reproducible (Kawakami *et al* 2002; Constantinides, 1995; Lawrence and Rees, 2000).

The design of effective formulation for drugs has long been a major challenge, because drug efficacy can be severely limited by instability or poor solubility in the vehicle. Although solid dispersion is one of the most widely used technique for solubility enhancement (Pabreja and Dua, 2011; Dahiya and Kaushik, 2010), nanoemulsions being a versatile technology have the greater potential to increase the bioavailability of drug in many ways. They act as supersolvents for poorly soluble drugs. Nanoemulsions have a higher solubilization capacity than simple micellar solutions and their thermodynamic stability offers advantages over