International Journal of Pharmaceutical Sciences and Nanotechnology
Volume 10 • Issue 1 • January – February 2017
MS ID: IJPSN-11-09-16-BHIKSHAPATHI

Research Paper

Erythrocytes as Carriers of Indinavir: Preparation, Characterization, *In vitro* and *In vivo* Pharmacokinetic Evaluation in Rats

D. V. R. N. Bhikshapathi[1*], A. Shiva Krishna[1], M. Ramesh[2], V. V. Rajesham[1], G. Suresh[1] and S. Jyothi Sri[3]

[1]CMR College Pharmacy, Kandlakoya, Medchal road, Hyderabad-501401, Telangana state, India, [2]Jubilant Biosys Limited, Yeshwanthpur, Bengaluru-560022, Karnataka state, India, and [3]MLR College of Pharmacy, Dundigal, Hyderabad-500043, Telangana state, India.

Received November 09, 2016; accepted December 12, 2016

ABSTRACT

Indinavir is a protease inhibitor of the human immunodeficiency virus. Indinavir is commercially available as capsule of 200 mg and 400 mg. Adult dose is 800 mg every 8 h. i.e., 2400 mg per day is equivalent to 6 capsules per day. No other dosage form is available in the market. Sustained release dosage form of indinavir can produce maximum therapeutic effect with minimum side effects and achieve better patient compliance. Various carriers have been used for the drug targeting among which cellular carriers such as erythrocytes offer greater potential advantages than other system. The drug is never free in circulation thus reducing toxicity and the drug half-life in circulation increases thus kinetic patterns. Antiretroviral-loaded erythrocytes offer a promising therapy against HIV owing to their potential to deliver this kind of drugs to macrophages and reticulo-endothelial (RES) tissues. The aim of the present investigation was to develop and optimize antiretroviral indinavir encapsulated in rat erythrocytes. In this study, the encapsulation of indinavir by rat erythrocytes prepared and compared with indinavir dissolved in normal saline. The prepared formulations were administered to rats by intravenous route and plasma samples was analysed by LC-MS/MS technique. The pharmacokinetic parameters were calculated using Winnonlin software. The prepared indinavir loaded erythrocytes showed enhanced bioavailability in equal dose due to higher extent of absorption owing to its retention in erythrocytes and releasing the drug slowly. Indinavir demonstrated a sustained release from loaded erythrocytes over a period of 36 h, which suggests a potential use of the erythrocyte as a slow systemic release system for antiretroviral drugs.

KEYWORDS: Indinavir; erythrocytes; LC-MS/MS; Reticulo-endothelium system; HIV.