Latin American Journal of Pharmacy
(formerly *Acta Farmacéutica Bonaerense)*
Lat. Am. J. Pharm. **37** (10): 1938-44 (2018)

Received: May 8, 2018
Accepted: July 29, 2018

Pharmacokinetics of Isoniazid and Rifampicin-Loaded Bovine Serum Albumin Nanoparticles in Rabbits

Zhaohui GE [1,2] #, Rong MA [2] #, Guangxian XU [2], Jing BAI [2], Siming LIANG [2], Zhen CHEN [2], Qian WANG [3], & Wei MA [1] *

[1] *The First Affiliated Hospital of Xi' an Jiaotong University, Xi' an 710061, China*
[2] *General Hospital of Ningxia Medical University, Yinchuan 750004, China*
[3] *University of South Florida College of Pharmacy, Tampa, FL, USA*

***SUMMARY*. The aim of this study was to evaluate the pharmacokinetics of isoniazid and rifampicin-loaded bovine serum albumin nanoparticles (INH-RFP-BSA-NPs) in rabbits after intravenous administration. Sixteen New Zealand rabbits were randomly divided into experimental group (administration of INH-RFP-BSA-NPs) and control group (administration of equal amounts of INH and RFP). INH and RFP blood plasma concentrations and pharmacokinetic parameters (C_{max}, $t_{1/2}$, AUC, MRT, CL, Vss) were observed. Plasma INH and RFP concentrations remained relatively stable and could be detected in serum until 96 and 48 h after administration, respectively. Significant differences in pharmacokinetic parameters of RFP were observed between the INH-RFP-BSA-NP and control group ($P < 0.05$). Except C_{max} or CL of INH, significant differences in other indices existed between these two groups ($P < 0.05$). Intravenous administration of INH- and RFP-loaded nanoparticles can maintain effective blood plasma concentrations of INH and RFP for an extended period of time. INH-RFP-BSA-NPs have good and sustained *in vitro* release effects.**

RESUMEN. El objetivo de este estudio fue evaluar la farmacocinética de nanopartículas de albúmina de suero bovino cargadas de isoniazida y rifampicina (INH-RFP-BSA-NP) en conejos después de la administración intravenosa. Dieciséis conejos de Nueva Zelanda se dividieron aleatoriamente en grupos experimentales (administración de INH-RFP-BSA-NP) y grupo de control (administración de cantidades iguales de INH y RFP). Se observaron las concentraciones plasmáticas de INH y RFP y los parámetros farmacocinéticos (C_{max}, $t_{1/2}$, AUC, MRT, CL, Vss). Las concentraciones plasmáticas de INH y RFP se mantuvieron relativamente estables y pudieron detectarse en el suero hasta 96 y 48 h después de la administración, respectivamente. Se observaron diferencias significativas en los parámetros farmacocinéticos de RFP entre INH-RFP-BSA-NP y el grupo control ($P < 0.05$). Excepto C_{max} o CL de INH, existieron diferencias significativas en otros índices entre estos dos grupos ($P < 0.05$). La administración intravenosa de nanopartículas cargadas con INH y RFP puede mantener concentraciones efectivas de INH y RFP en plasma sanguíneo durante un período de tiempo prolongado. INH-RFP-BSA-NP tiene buenos y sostenidos efectos de liberación *in vitro*.

KEY WORDS: albumin, isoniazid, nanoparticles, pharmacokinetic processes, rifampicin.

# These authors contributed equally to this work
* Author to whom correspondence should be addressed. *E-mail:* drmawei60@163.com

ISSN 0326 2383 (printed ed.)
ISSN 2362-3853 (on line ed.)