COMMUNICATION

Very Rapid Dissolution Is Not Needed to Guarantee Bioequivalence for Biopharmaceutics Classification System (BCS) I Drugs

H. KORTEJÄRVI,1,2 R. SHAWAHNA,2,3 A. KOSKI,1 J. MALKKI,1 K. OJALA,1 M. YLIPERTTULA2

1Research and Development, Orion Pharma, P.O. Box 65, 02101 Espoo, Finland
2Division of Biopharmaceutics and Pharmacokinetics, University of Helsinki, P.O. Box 56, FIN-00014 Helsinki, Finland
3Faculty of Pharmacy & Alternative Medicine, The Islamia University of Bahawalpur

ABSTRACT: Currently, the EMEA, FDA, and WHO as regulatory authorities accept rapidly dissolving (>85% dissolved in 30 min) biopharmaceutics classification system (BCS) I drug products for biowaiver candidates. In the draft EMEA guideline the requirement has been set tighter, that is, the drug product should be very rapidly dissolving (>85% dissolved in 15 min) to be eligible for a biowaiver. Pharmacokinetic modeling of 32 BCS I drugs was performed to demonstrate that very rapid dissolution is not necessary to guarantee bioequivalence for them. Rapid dissolution and similar dissolution profiles are sufficient criteria for all BCS I drugs.

INTRODUCTION

Biopharmaceutics classification system (BCS) I drugs are currently accepted as eligible for biowaivers. For these drugs, in vitro dissolution studies can be used as surrogate for in vivo bioequivalence studies. In the draft EMEA guideline on the investigation of bioequivalence, BCS I drugs are accepted as biowaiver candidates if the drug product is very rapidly dissolving (>85% dissolved in 15 min) to be eligible for a biowaiver. Pharmacokinetic modeling of 32 BCS I drugs was performed to demonstrate that very rapid dissolution is not necessary to guarantee bioequivalence for them. Rapid dissolution and similar dissolution profiles are sufficient criteria for all BCS I drugs. © 2009 Wiley-Liss, Inc. and the American Pharmacists Association J Pharm Sci 99:621–625, 2010

Keywords: bioequivalence; biopharmaceutics classification system (BCS); dissolution rate; absorption; solubility

MATERIALS AND METHODS

Biopharmaceutical Classification

Simulations were performed with 32 BCS I drugs from the WHO model list of essential medicines. The selection of BCS I drugs was based on the