Bulletin of Faculty of Pharmacy, Cairo University (2015) **53**, 195–205

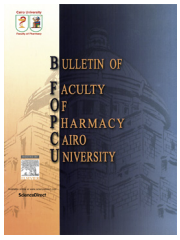
HOSTED BY

ELSEVIER

Cairo University

Bulletin of Faculty of Pharmacy, Cairo University

www.elsevier.com/locate/bfopcu
www.sciencedirect.com



REVIEW ARTICLE

A review on controlled porosity osmotic pump tablets and its evaluation

Chinmaya Keshari Sahoo [a,*], **Nalini Kanta Sahoo** [b], **Surepalli Ram Mohan Rao** [c], **Muvvala Sudhakar** [d], **Kokkula Satyanarayana** [e]

[a] *Department of Pharmaceutics, Osmania University College of Technology, Osmania University, Hyderabad, Telangana 500007, India*
[b] *MNR College of Pharmacy, Fasalwadi, Sangareddy, Medak, Telangana 502294, India*
[c] *Dept. of Chemical Engineering, Osmania University College of Technology, Hyderabad, Telangana 500007, India*
[d] *Department of Pharmaceutics, Malla Reddy College of Pharmacy, Maisammaguda, Secunderabad, Telangana 500014, India*
[e] *Department of Pharmacognosy, Princeton College of Pharmacy, Korremula, Ghatkesar, R.R. District, Telangana 500088, India*

Received 17 May 2015; accepted 18 October 2015
Available online 3 November 2015

KEYWORDS

Osmotic drug delivery system;
Osmosis;
CPOP;
Microporous;
Zero order

Abstract Conventional drug delivery system provides an immediate release of drug which does not control the release of the drug and does not maintain effective concentration at target site for a longer period of time. Hence to avoid the shortcomings there is development of various controlled drug delivery systems. Among these osmotic drug delivery system (ODDS) utilizes the principle of osmotic pressure and delivers drug dose in an optimized manner to maintain drug concentration within the therapeutic window and minimizes toxic effects. ODDS releases drug at a controlled rate that is independent of the pH and thermodynamics of dissolution medium. The release of drug from ODDS follows zero order kinetics. The release of drug from osmotic system depends upon various formulation factors such as solubility, osmotic pressure of the core components, size of the delivery orifice and nature of the rate controlling membrane. Controlled porosity osmotic pump (CPOP) contains drug, osmogens, excipients in core and a coating of semipermeable membrane with water soluble additives. In CPOP water soluble additives dissolve after coming in contact with water, resulting in an in situ formation of a microporous membrane. The present study gives an idea about osmosis, CPOP, components of CPOP and its evaluation.

* Corresponding author.
E-mail address: Id-sahoo.chinmaya83@gmail.com (C.K. Sahoo).
Peer review under responsibility of Faculty of Pharmacy, Cairo University.

http://dx.doi.org/10.1016/j.bfopcu.2015.10.004

Contents

1. Introduction

Oral route[1] is a convenient route for the administration of various drugs because of low cost and ease of administration to the patients. But conventional drug delivery system does not control the release of drug and provides immediate release of drug. The rate and extent of drug absorption from conventional formulations change significantly depending on factors such as physicochemical properties of the drug, presence of excipients, physiological factors such as presence or absence of food, pH of gastrointestinal (GI) tract, GI motility[2]and so on. To overcome these shortcomings researchers have focused on the development of novel drug delivery system[3] (NDDS). Among various designs of NDDS available in the market per oral controlled release system provides improved patient compliance, convenience and reduction in fluctuation in a steady state plasma level.[5] In Controlled drug delivery system (CDDS) there is a maximum utilization of drug optimizing reduction in total amount of dose and delivers short biological half life of drugs.[4] CDDS offers temporal and spatial control