

SUSTAINED RELEASE FORMULATIONS OF METOPROLOL TARTARATE USING HYDROPHILIC MATRIX SYSTEM

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ABSTRACT

The Objective of the study is to design oral controlled drug delivery systems for highly water-soluble drugs, using Hydroxypropyl methyl cellulose (HPMC)- a non-ionic hydrogel. Metoprolol tartarate was chosen as a model drug because of its high water solubility¹. Matrix tablets containing about 35% of HPMC were prepared by wet granulation technique. The matrix tablets were evaluated for hardness, thickness, uniformity and subjected to *in vitro* drug release studies. The drug release from the metoprolol tartarate matrix tablets was according to Higuchi's laws showed a quicker release at the beginning and slower at the end which is a characteristic of an inert matrix with pores. The result indicated that HPMC is a potent carrier in the design of oral controlled drug delivery systems for highly water soluble drugs such as metoprolol tartarate.

Keywords: Metoprolol tartarate and hydrophilic matrix system.

INTRODUCTION

Sustained release dosage forms are now becoming increasingly popular. Matrix sustained release tablets have proved especially favourable, since they can be produced at relatively low cost using suitable excipients. Sustained release dosage form include single-unit and multi-unit forms as well as coated forms and matrix forms² But production of coated single unit forms has been regarded as a malpractice, as the risk of dose dumping due to an incorrectly applied coating, or damage to a coating was too high. Metoprolol tartarate is one of the most useful antihypertensive drug will plasma half life of 3-4 hr only.

EXPERIMENTAL

Materials

HPMC E15Lv, apparent viscosity 15cps (Loba Chemic, Mumbai). Metoprolol tartarate (Cipla Ltd, Ahmedabad).

Manufacture of Tablets

Metoprolol tartarate was granulated with HPMC, mixed with other excipients for 10 minutes and compressed into tablets with a force of about 10KN.

Tablet Composition

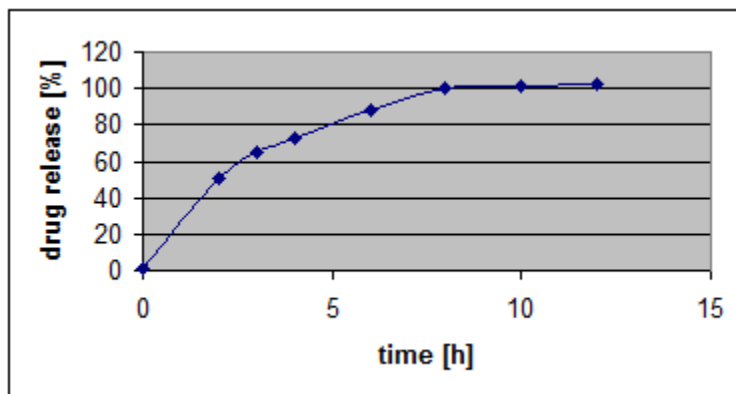
Metoprolol tartarate	200mg
Hydroxypropyl Methyl Cellulose	160mg
Starch	38.2mg
Lactose	38.2mg
Microcrystalline cellulose	22mg
Magnesium Stearate	2.2mg.
Total Tablet Weight	460.6mg

Determination of Tablet properties

Dimensions, weight, friability and hardness using vernier Caliper (Mitutoyo, Japan), Electronic Balance, (ANAMED instruments (P) Ltd.), Roche friabilator (for 4min, 25rpm) and ERWEKA TBT 28 apparatus (Erweka GmbH, Germany) respectively.

In vitro Drug Dissolution Studies

The dissolution experiment was performed in dissolution test apparatus (USP std.) paddle method, 100rpm, 37°C, using Phosphate buffer pH 6.8 for 2 to 12 hr³. The drug concentration was measured using a UV spectrophotometer (Genesys-2) at 254nm.



RESULTS AND DISCUSSION

Tablet parameters

Weight	460.6mg.
Diameter	12mm
Thickness	4mm
Form	Biplanar
Hardness	220 N
Friability	0.1%

The drug release from the matrix tablets was almost according to Higuchi's law showing a

quicker release at the beginning and slower at the end⁴. Controlled release of metoprolol tartarate for a period of more than 12 hrs was obtained.

Conclusion

Sustained release matrix tablet formulation showed good, physical tablet properties and dissolution rate. Thus HPMC can be used as a potent carrier in the design of oral controlled drug delivery systems for highly water soluble drugs such as metoprolol tartarate and an excellent in vitro dissolution rate can be obtained by slight modification of the above formula.

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