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FORMULATION AND EVALUATION OF CHLORZOXAZONE MICROSPHERES BY THERMAL CHANGE METHOD

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ABSTRACT

The present work was carried out to prepare chlorzoxazone microsphere using ethylcellulose as carrier and to evaluate it in vitro studies.the prepared microsphere were evaluated for drug content, particle size distribution, and compared with market tablets. the percentage of entrapment obtained was 87%.in vitro release studies were carried out in phosphate buffer of ph 7.4 for period 4 hrs and 47,38,41% of drug released from 1,2,3 gm of ethyl cellulose respectively for 4 hrs.

INTRODUCTION

Microencapsulation is a process of applying a thin coatings to small particles of solids containing one (or) more drugs and dispersions. The core material referred as nucleus (or) fill and the coating as wall (or) shell. Microsphere can be defined as solid approximately spherical particles ranging from 1 to10,000 um.they are made of polymeric, waxy or protective material i.e Biodegradable synthetic polymers and modified natural products such as starch ,ethyl cellulose, Protein ,gums ,fat and waxes. the natural polymer include alubumin and gelation. the synethic polymer include polylactic acid and polyglycolicaci. targeting is the controlled distribution of drug carrier in the body for specific sites.it not only reduce the dose of drug reaching to the effective biological sites rapidly but also reduced toxicity.various attempt made in the field of targeting but in the past few years, pharmacist have focused there research in colloidal drug delivery system/colloidal carrier like liposomes, microsphere and nanoparticles as targeting carrier which has given selective targetting .ethylcellulose is used as hydrophobic agent. Chlorzoxazone microsphere were used for delivery of systemic mastocytosis ulcerative colitis in sufficient amount for a desired period of time without any severe side effect. microsphere drug administration offer a number of advantages in therapeutics,where the controlled release of drug delivery as well as the predicatable and reproducible drug release kinetics is a important features of them. The aim of present work to investigate the possibility of obtaining a prolonged, relatively constant effect level of chlorzoxazone from the microsphere formulation using ethyl cellulose as carrier .The dosage regimen of Chlorzoxazone is four times a day. So Chlorzoxazone is chosen as a drug for the formulation of microspheres in order to to increase the duration of action of drug. Equivalent to 100mg of drug (chlorzoxazone) and the polymer (ethyl cellulose) were taken.The 100mg of ethyl cellulose and cyclohexane was heated in a water bath.The temperature was gradually raised to 70°C over a period of 20 minutes under constant stirring. Drug was dispersed slowly and temperature maintained at 80°C for 30 minutes. Slowly cooled with constant stirring.The temperature is reduced to 20°c.The microspheres were obtained by filtration and it is dried. The prepared microsphere were first evaluated for drug content to estimate the amount encapsulated. The microspheres equivalent to 100mg of chlorzoxazone were tied in muslin cloth and placed in basket of USP XXII dissolution test apparatus at a rotational speed of 50 rpm maintained at 37±1° in 900ml of phosphate buffer of PH 7.4. Sample of 5ml were withdrawn at hourly interval and filtered through Whatmann filter paper no.44 replacing the same volume with fresh dissolution medium. After each sampling the drug content was determined in the filtrate after suitable dilution spectrophotometrically at 282nm. To confirm that drug is not interacting with the polymer under experimental conditions and shelf life. Chlorzoxazone was mixed with ethyl cellulose in the ratio of

1:3 and dissolved on methanol. The solvent was then evaporated over a water bath and the residue thus obtained was analyzed for IR using KBr pellets. The IR absorption spectra of all the formulation were run between 600- 4000/cm.the percentage of drug entrapment was found to be 87% for all the formulation. IR studies revealed that there is no interaction between drug and polymer,the invitro dissolution release studies,the pure drug release 94.72% of drug with in 4 hr and the marketed drug release 93% with in 4 hrs.the microsphere formulated of chlorzoxazone using ethylcellulose retard the release of chlorzoxazone from the microsphere and produce sustained action. the microsphere prepared with 1gm of ethyl cellulose release 48,19% chlorzoxazone at 4hr.and 2gm ,3gm of ethylcellulose microsphere release the drug chlorzoxazone 37.62% ,41.82%at 4hrs For the preparation of chlorzoxazone standard curve,The United States Pharmacopeia was followed.

Materials and Methods

100mg of drug (chlorzoxazone) was accurately weighed and dissolved in phosphate buffer (P^H – 7.4) in a 100ml standard flask and make up the volume with buffer. From this 10ml was pipetted out and diluted to 100ml with buffer. From this 1ml, 2ml, 3ml , 4ml, 5ml samples were pipetted out into different 50ml standard flask and make up the volume with buffer. The absorbance was measured at 282nm. Beer's law was found to obey in the range of 1 to 10 mg/ml.

DRUG CONTENT ESTIMATION

It was determined according to I.P. The absorbances were measured and the percentage of drug content was determined in the following table.

S.No	Ratio	% drug content
1.	1:1	89.26%
2.	1:2	86.74%
3.	1:3	85.32%

Table-1

IR studies revealed that there is no interaction between drug and the polymer.

3. IN-VITRO DRUG RELEASE

The formulated microsphere drug release was studied in phosphate buffer of P^H – 7.4 for a period of 4 hrs. The release rate of the microspheres was determined in the following table.

PLANE DRUG

S.No	Time in min	%drug release
1.	15	22 %
2.	30	48 %
3.	45	76 %
4.	1 hr	94 %

Table-2

S.No	Time in hrs	%drug release
1:1	4 hrs	48 %
1:2	4 hrs	37%
1:3	4 hrs	41%

Table-3

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