DEVELOPMENT AND EVALUATION OF COLON TARGETED MULTIPARTICULATE SYSTEM OF ONDANSETRON HYDROCHLORIDE

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INTRODUCTION

- The necessity and advantages of colon targeted drug delivery systems (CoDDS) have been well recognized and documented.
- In addition to providing more effective therapy of colon related diseases such as irritable bowel syndrome, inflammatory bowel disease including Crohn's disease and ulcerative colitis, CoDDS has the potential to address important unmet therapeutic needs including oral delivery of macromolecular drugs.
- Most of CoDDS have been generated as single unit dosage form, but multiparticulate system offer great advantages over the single unit system like less local irritation, no risk of dose dumping, less inter and intra-subject variability, reduced risk of systemic toxicity, improve bioavailability, flexibility in design, with some disadvantages like higher cost of production,

introduction continues…….

need of newer technology, lower drug loading etc.

- Moreover, multiparticulate systems are to be more uniformly dispersed in the gastrointestinal tract and also ensure more uniform drug absorption and shows better reproducible pharmacokinetic behavior than conventional (monolithic) formulations.

OBJECTIVE

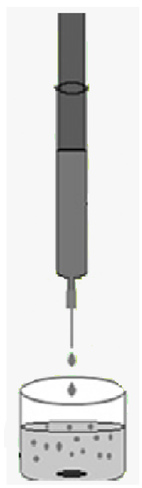
- The aim of present study was to develop multiparticulate systems (microbeads) using ondensetron hydrochloride dihydrate by ionotropic gelation method. The microbeads were formulated using sodium alginate as cationic polymer and calcium chloride dihydrate as cross linking agent. Further the microbeads were enteric coated with Eudragit® S100 to prevent premature release of drug in small intestine.

EXPERIMENTAL WORK

Preparation of drug loaded calcium alginate microbeads:

Homogeneous dispersion of Sodium alginate and ondensetron HCl in distilled water was extruded through 20 gauge needle

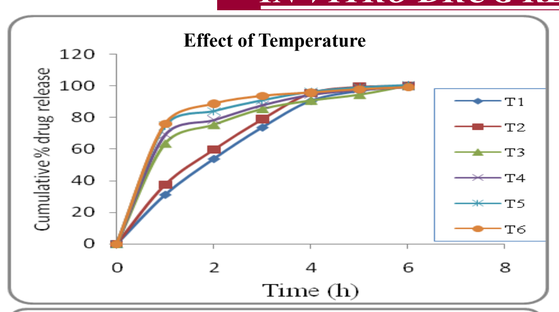
Calcium chloride dihydrate solution as cross linking agent with gentle agitation

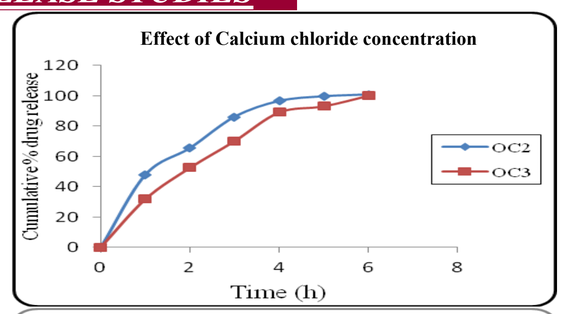


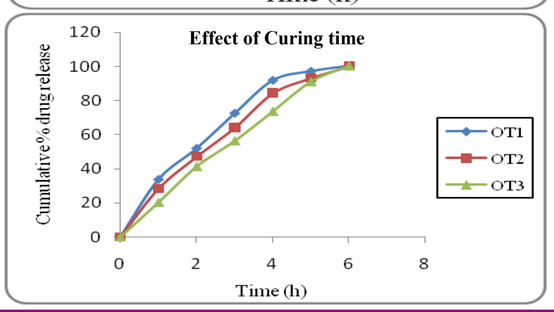
Beads formed are washed with distilled water, and first air dried at RT followed by oven drying at 50°C for 4 h

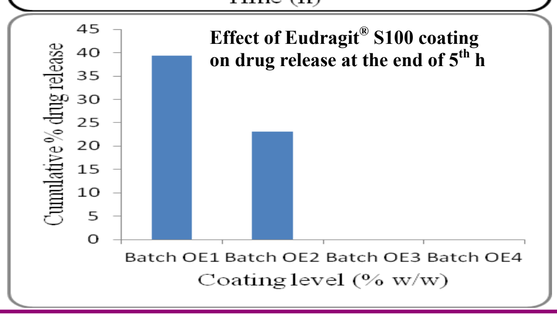
The beads were collected and kept in vacuum desiccators for two days to achieve constant weight.

IN VITRO DRUG RELEASE STUDIES

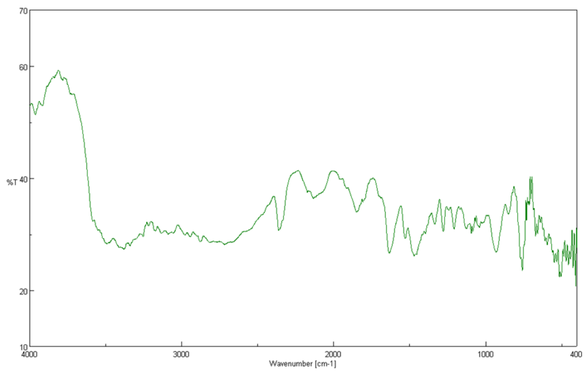




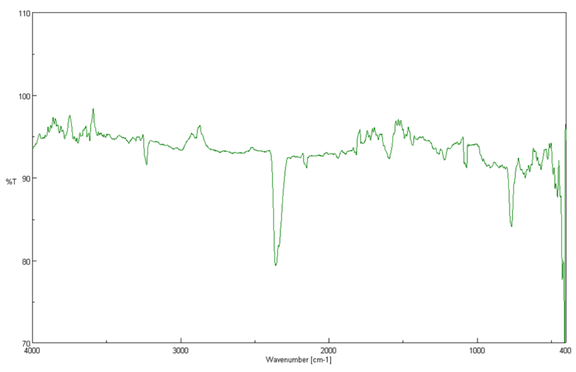




FT-IR SPECTRA

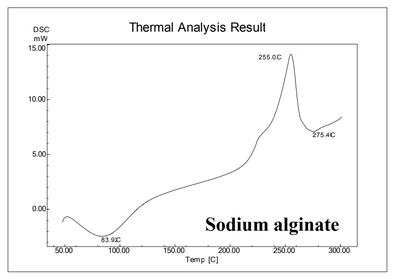


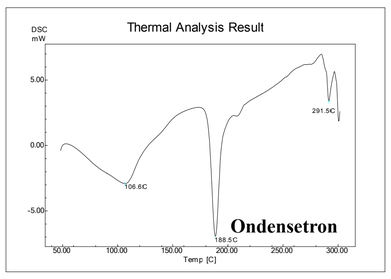
FT-IR Spectra of drug

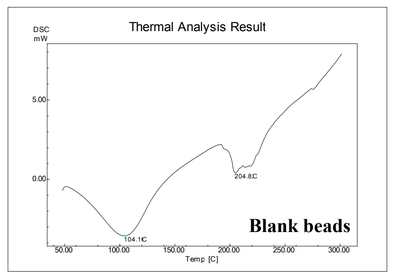


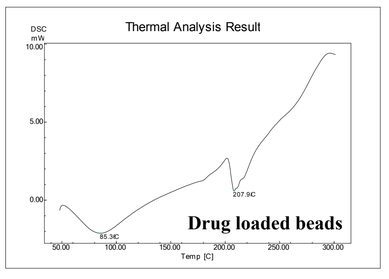
FT-IR Spectra of drug loaded microbeads

DIFFERENTIAL SCANNING CALOMERTY

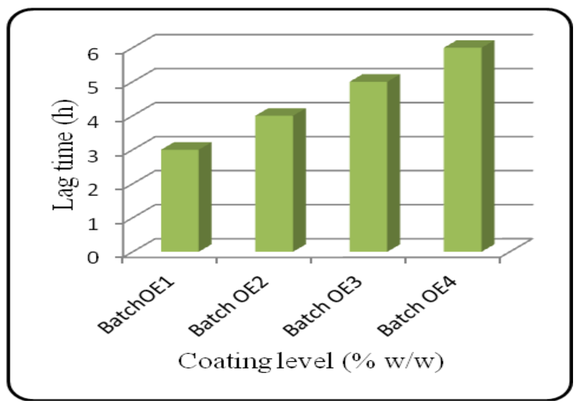


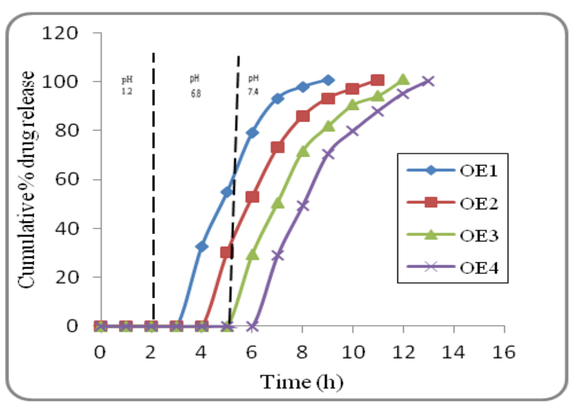




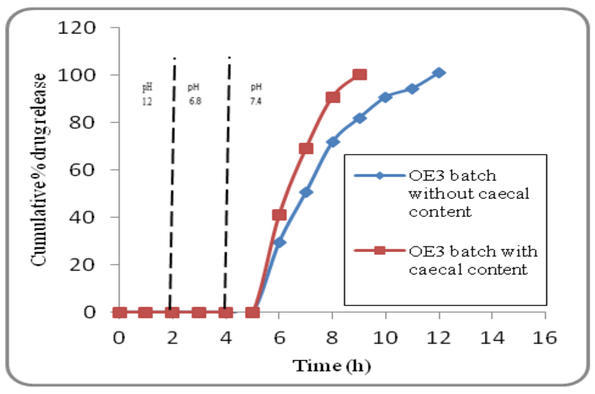


FORMULATION OF CoDDS

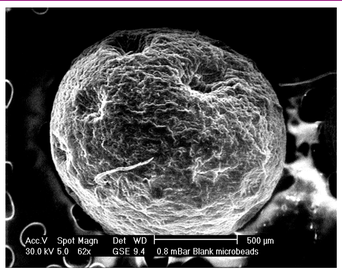




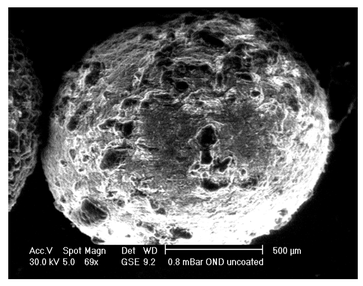
Effect of Eudragit® S100 coating on lag time and cumulative % drug release



Ex-vivo dissolution drug release profile of batch OE3



SEM of Blank microbeads



SEM of Drug loaded microbeads

CONCLUSIONS

- This study demonstrated that ondensetron hydrochloride dihydrate-loaded CoDDS exhibited promising targeting and hence may be used for irritable bowel syndrome. Sodium alginate is a biocompatible polymer could be useful for delivery of ondensetron hydrochloride dihydrate in the colonic region.

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