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Short Communication

Formulation and Evaluation of Beta-Cyclodextrin Complex Tablets of Ibuprofen

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ABSTRACT

The objective of present study is to prepare complexes of ibuprofen with Cyclodextrin in molar ratio by co-precipitation method. The inclusion complexes was further formulated into tables by direct compression technique using superdisintegrants in order to increase the solubility of ibuprofen for improvement of dissolution rate and bioavailability. The prepared Tablets were evaluated for various pharmaceutical characteristics viz. hardness, % Friability, drug content and *in-vitro* release profiles

Keywords: Beta-Cyclodextrin (β-CD), Ibuprofen, Inclusion complex

1. INTRODUCTION

Cyclodextrins are cyclic oligosaccharides, containing six, seven or eight glucopyranose units (α, β or γ respectively) obtained by the enzymatic degradation of starch. Cyclodextrins are able to form inclusion complexes with poorly water-soluble drugs and have been shown to improve pharmaceutical properties like solubility, dissolution rate, bioavailability and stability. β-cyclodextrin (β-CD) appears most useful as a pharmaceutical complexing agent because of its complexing ability, low cost and other properties. Ibuprofen a non-steroidal anti-inflammatory drug was

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selected as a model drug, which is a propionic acid derivative used in the treatment of rheumatoid arthritis and osteoarthritis. [1, 2]

In the present study attempt has been made to prepare, formulate and characterize inclusion complexes of ibuprofen with β-CD and was further formulated into tablets by direct compression technique.

2. MATERIALS AND METHODS

2.1 Materials

Ibuprofen and β-cyclodextrin were obtained from Yarrow chem; Sodium starch glycolate and talc and Magnesium stearate were purchased from Loba chemie; Micro crystalline cellulose was purchased from Merck.

2.2 Method [3]

Ibuprofen was dissolved in ethanol at room temperature and β -Cyclodextrin was dissolved in distilled water. Ibuprofen and β-Cyclxodetrin (1:1M) mixture was stirred at room temperature, for one hour and then slowly evaporated on a boiling water bath. The inclusion complex precipitated as a crystalline powder was pulverized and passed through sieve No. 80 and stored in desiccators till free from any traces of the organic solvent.

The complex of ibuprofen and β-Cyclxodetrin was prepared into tablets by direct compression methods (containing 200 mg of ibuprofen) using sodium starch glycolate, microcrystalline cellulose, talc and magnesium stearate as excipients. Three batches (F1, F2, and F3) were prepared and variations were amount of sodium starch glycolate and microcrystalline cellulose used.

3. RESULTS AND DISCUSSIONS

The results were shown on table 1 and figure 1. From the literature review it was seen that the solubility of ibuprofen drug in water is very low[4]. But when inclusion complex formation of β-cyclodextrin with ibuprofen occurred, then the solubility increases (done by phase solubility study). As a result dissolution rate of the formulations increases with slight addition of super disintegrates like sodium starch glycolate.

Table 1: Evaluation of Tablets containing Ibuprofen with β-Cyclxodetrin inclusion complexes

Formulation code	Hardness (Kg/cm)*	Friability (%)*	Drug content (%)*
F1	6.40±0.52	0.272±0.005	98.68±0.12
F2	5.75±0.82	0.268±0.006	97.59±0.36
F3	5.50±0.74	0.263±0.005	98.72±0.37

* All value are express as Mean± (t X SEM), n =10

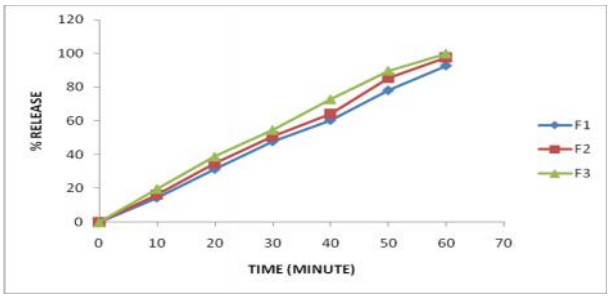

Fig 1: Comparative release profile of formulation F1 to F3

4. CONCLUSION

β-cyclodextrin can used to prepare inclusion complex of ibuprofen tablets with improved solubility. From the experiment it was seen that all the prepared three batches containing inclusion complex of tablets show good solubility and dissolution rate than pure drug. Therefore, long term stability study and clinical trial is required for future development of this dosage form.

5. ACKNOWLEDGEMENT

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