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FORMULATION AND *IN VITRO* EVALUATION OF ETORICOXIB SOLID DISPERSION BY USING HYDROPHILIC POLYMERS

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INTRODUCTION

Etoricoxib is a selective COX-2 inhibitor, belongs to BCS class II drugs. Soild dispersion techniques can be used to increase the dissolution and absorption of insoluble drugs. Numbers of insoluble drugs have been shown to improve their dissolution character when converted to solid dispersions.

Objective

In the present investigation, an attempt was made to improve the dissolution rate of Etoricoxib through the preparation of Solid Dispersion with hydrophilic polymer like PEG 6000, PEG 4000 and mannitol. The prepared dispersion were evaluated for their physiochemical and dissolution characteristics.

Experimental Methods

The solid dispersions of Etoricoxib with PEG 6000, PEG 4000 and mannitol were prepared by melting method in different ratio of drug: polymer (1: 1, 1: 3, 1: 5). A required amount of various proportions were melted in a china dish over a water bath maintained at about 50-60°C to get a molten mass through mixing. Then the molten mixture was cooled and solidified immediately in an ice bath with vigorous stirring. The hardened mass was then powdered in a mortar, sieved through a 80µ sieve screen and stored in a screw-cap vial in desiccator at room temperature.

After all formulations, evaluated for various characteristics like Wettebility studies (Methylene blue as dye) Solubility studies and *in vitro* Dissolution studies using distilled water as media.

Table 1.

Sl. No	Formulation Code	Name of the carriers	Drug:carriers
1	F1	PEG6000	1:1
2	F2	PEG6000	1:3
3	F3	PEG6000	1:5
4	F4	PEG4000	1:1
5	F5	PEG4000	1:3
6	F6	PEG4000	1:5
7	F7	MANNITOL	1:1
8	F8	MANNITOL	1:3
9	F9	MANNITOL	1:5

RESULTS AND DISCUSSION

Etoricoxib solid dispersions were successfully prepared using various hydrophilic polymer like polyethylene glycols (PEG 6000 & PEG 4000) and mannitol in the ratios (1:1, 1:3,1:5) by melting method. The dispersion F3 containing drug: PEG 6000 in 1:5 ratio shows acceptable dissolution compared to the PEG 4000 then mannitol then pure drug. From solubility studies, it was found that F3 shows highest solubility (5. 32mg/ml) that other formulations and pure etoricoxib (2.29mg/ml). From the wettability studies it was found that F3 show less wetting time (33 sec) than other formulations and pure etoricoxib 14 minutes. From the dissolution studies of all formulation, F3 (drug: PEG 6000 in 1:5 ratio) shows highest % of drug release 99.03% in 15 minute than other formulation and pure drug (50. 80%, 60 minutes) From wetability studies, solubility studies and dissolution studies, its was found that F3 is the best formulation as compared to other formulations and pure etoricoxib.

Table: 2.

Formulation Code	Solubility Result (mg/ml)	Wetting time (in seconds)	%Dr (in 30 minutes)
Pure Drug	2.29 mg/ml		33.33
F 1	4. 31 mg/ml	90	72.27
F 2	4. 78 mg/ml	67	94.39
F 3	5.32 mg/ml	33	99.03 (in 15 min.)
F 4	3.69 mg/ml	123	63.30
F 5	4.41 mg/ml	106	77.40
F 6	4.89 mg/ml	51	95.51
F 7	2.86 mg/ml	180	52.24
F 8	3.31 mg/ml	138	72.71
F 9	3.94 mg/ml	83	94.87

CONCLUSION

It is concluded that, Drug: PEG 6000 in 1:5 ratio prepared by melting method gives highest drug release (99.03%, in 15 minute), than PEG 4000, mannitol and pure drug (33.33%, in 30 minute). The dissolution of all the preparation follows first order release kinetics.

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