International Standard Serial Number (ISSN): 2249-6807

International Journal of Institutional Pharmacy and Life Sciences 2(2): March-April 2012

INTERNATIONAL JOURNAL OF INSTITUTIONAL PHARMACY AND LIFE SCIENCES

Pharmaceutical Sciences **Research Article……!!!**

Received: 05-04-2012; Accepted: 12-04-2012

FORMULATION AND EVALUATION OF ACECLOFENAC WITH PARACETAMOL RAPIMELTS

Snehalatha*[1], B.Shivakumar[2], Manasa Gururaj[1]

1. P.G. Department of Pharmaceutics, S.J.M.College of Pharmacy, Chitradurga, Karnataka.

2. P.G. Department of Pharmachemistry, BLDEA'S College of Pharmacy ,Bijapur.

Keywords:

Rapimelts, Aceclofenac(ACE) with Paracetamol(PARA) , Primogel(CCS) , Ac-di-sol(SSG), Direct compression

For Correspondence:

Snehalatha

P.G. Department of Pharmaceutics,

S.J.M.College of Pharmacy,

Chitradurga, Karnataka.

E-mail:

sanjusammu.cta@gmail.com

ABSTRACT

The purpose of this investigation was to develop rapimelts of aceclofenac with paracetamol. Rapimelts of aceclofenac with paracetamol were prepared by direct compression technique using primogel and Ac-di-sol as superdisintegrants. The preformulation study includes the compatability of drugs with the polymers by using FTIR. The formulations were evaluated for weight variation, hardness, friability, drug content, wetting time, wetting volume, test for dispersion, *in-vitro* dissolution. The simultaneous estimation was carried out for the aceclofenac with paracetamol rapimelts by Spectrophotometric method at 274nm and243nm respectively. The formulation F2 with primogel with 5% concentration showed best results and rapid *in-vitro* dissolution. The results revealed that the tablets containing superdisintegrant primogel had a good dissolution profile. The drug content of all the formulations was within the acceptable limits of the United States Pharmacopoeia XXVII. The optimized formulation showed good release profile with maximum drug being released at all time intervals. The present study demonstrated potentials for rapid absorption, improved bioavailability, effective therapy and patient compliance.

INTRODUCTION

Many patients especially geriatrics and paediatrics find it difficult to swallow solid dosage forms like tablets and capsules. This may result in patient non-compliance and ineffective therapy. Hence to overcome this problem rapimelts were developed. Rapimelts are also known as mouth dissolving tablets; melt in mouth, orodispersible tablets or porous tablets[1,2,3]. Rapi melts are the solid dosage forms that disintegrate faster in the mouth within few seconds and thus are swallowed without the need of water. Disintegration produces finer particles resulting in a higher surface area and faster dissolution.[4,5] In the present study, rapimelts of aceclofenac with paracetamol were prepared using different superdisintegrants. The FTIR studies showed drug and carrier were compatible. Aceclofenac, a nonsteroidal anti-inflammatory drug (NSAID) has been indicated for various painful indications and proved as effective as other NSAID's with lower indications of gastro-intestinal adverse effects and thus, resulted in a greater compliance with treatment[5]. Aceclofenac is practically insoluble. For poorly soluble orally administered drugs, the rate of absorption is often controlled by the rate of dissolution[6]. Paracetamol is under class of paraminophenol derivative under the class of analgesic-antipyretic with poor anti-inflammatory action. Paracetamol is rapidly absorbed from the gastrointestinal tract but it is incompletely available due to first pass effect. Extensive metabolism occurs, predominantly in the liver, the major metabolites being the sulphate and the glucuronide conjugates[7]. The present study involves formulation and evaluation the effect of combination of aceclofenac and paracetamol rapi-melt tablets using two superior disintegrants Ac-di-sol, Crosscarmellose sodium.

OBJECTIVE

1. Preformulation study of Paracetamol and Aceclofenac with disintegrants
2. To design and formulate aceclofenac with paracetamol rapimelts
3. To evaluate the rapimelts for various parameters

MATERIAL AND METHOD

Aceclofenac (Gift sample from Uforic Pharmaceuticals pvt. Ltd. Ankleshwar), croscarmellose sodium(yarrow chemicals, Mumbai) and Sodium starch glycolate (gift sample from micro labs, Banglore), Dextrose, magnesium stearate, sodium saccharine from S.D Fine Chem. Mumbai**.**

SIMULTANEOUS ESTIMATION OF ACECLOFENAC AND PARACETAMOL

Preparation of Standard Solutions[8]

Standard stock solution containing Aceclofenac (ACE) and Paracetamol (PARA) was prepared by dissolving 10mg of Aceclofenac and Paracetamol separately in 20ml of methanol and then

final volume of both the solutions was made up to 100ml with Glass distilled water to get stock solution containing 100µg/ml of Aceclofenac and 100µg/ml of Paracetamol in two different 100ml volumetric flask.

Procedure for Determining the Sampling Wavelength for Simultaneous Analysis[8]

By appropriate dilution of two standard drug solutions with methanol: Glass distilled water, solutions containing 10µg /ml of Aceclofenac and 10µg/ml of Paracetamol were scanned separately in the range of 200-400nm to determine the wavelength of maximum absorption for both the drugs. Aceclofenac and Paracetamol showed absorbance maxima at 274nm and 248nm respectively.

EXPERIMENTAL METHODS

Tablets containing 100mg of Aceclofenac and 500mg of Paracetamol were prepared by direct compression method and the various formulae used in the study[9]. Total six formulations with different concentration of primogel (F1, F2, F3) and Ac-di-sol (F4, F5, F6) were prepared. The drug, diluents, superdisintegrants and sweetener are passed through sieve #60.All the above ingredients were properly mixed together (in a poly-bag). Talc and magnesium stearate were passed through sieve #30, mixed and blended with initial mixture in a poly-bag.[10] The powder blend was compressed in to tablets on ten station rotary punch-tableting machine(Rimek mini press-1, Model RSB-4, Karnavati Engineering, Ahmedabad). The prepared tablets were evaluated for various parameters like hardness, friability, wetting time, wetting volume, uniformity of dispersion, disintegration time, dissolution study and dissolution efficiency.[11, 12]

TABLE 1

FORMULATION FOR RAPIMELTS OF ACECLOFENAC WITH PARACETAMOL

INGREDIENTS	F1(mg)	F2(mg)	F3(mg)	F4(mg)	F5(mg)	F6(mg)
Aceclofenac	100	100	100	100	100	100
Paracetamol	500	500	500	500	500	500
S.S.G	32	40	48	---	---	---
C.C.S	---	---	---	8	16	24
S.S	10	10	10	10	10	10
Starch	3	3	3	3	3	3
M.S	2	2	2	2	2	2
Dextrose	153	145	137	---	---	---
Lactose	---	---	---	177	168	161

(S.S.G-Sodium Starch Glycolate, C.C.S-Crosscarmellose Sodium, S.S-Sodium Sachharin, M.S-Magnesium Stearate)

TABLE 2 PRECOMPRESSIONAL EVALUATION OF POWDER BLEND:

Formulations	Bulk Density (gm/ml)	Tapped Density(gm /ml)	Angle of Repose$^{(0)}$	Carr's Index	Test for dispersion	Hausner's ratio
F_1	0.58±0.06	0.66±0.075	27.06±1.67	12.26	Passes	1.137
F_2	0.61±0.04	0.69±0.064	24.17±1.75	10.14	Passes	1.131
F_3	0.64±0.04	0.72±0.047	24.51±1.42	11.11	Passes	1.251
F_4	0.61±0.04	0.69±0.064	25.23±1.23	11.5	Passes	1.131
F_5	0.6±0.034	0.69±0.027	26.73±1.37	13.0	Passes	1.151
F_6	0.67±0.04	0.67±0.047	26.38±1.42	10.0	Passes	1.000

mean±SD,n=3(all the values are the average of three determinations)

TABLE 3 POST COMPRESSIONAL EVALUATION OF FORMULATED TABLETS:

Formulations	Weight Variation*	Hardness (Kg/cm2)	Friability* (%)	*In vitro* Disintegration Time (seconds)	Wetting time (seconds)
F_1	799±0.5	3.8	0.72±0.07	40	57
F_2	798.9±0.45	3.6	0.56±0.12	28	49
F_3	799.1±0.43	3.5	0.65±0.02	34	61
F_4	798.8±0.44	3.7	0.60±0.11	39	103
F_5	799.4±0.40	3.6	0.58±0.06	30	65
F_6	799±0.5	3.9	0.57±0.21	43	80

*mean±SD, n=3(all the values are the average of three determinations)

FIGURE 1

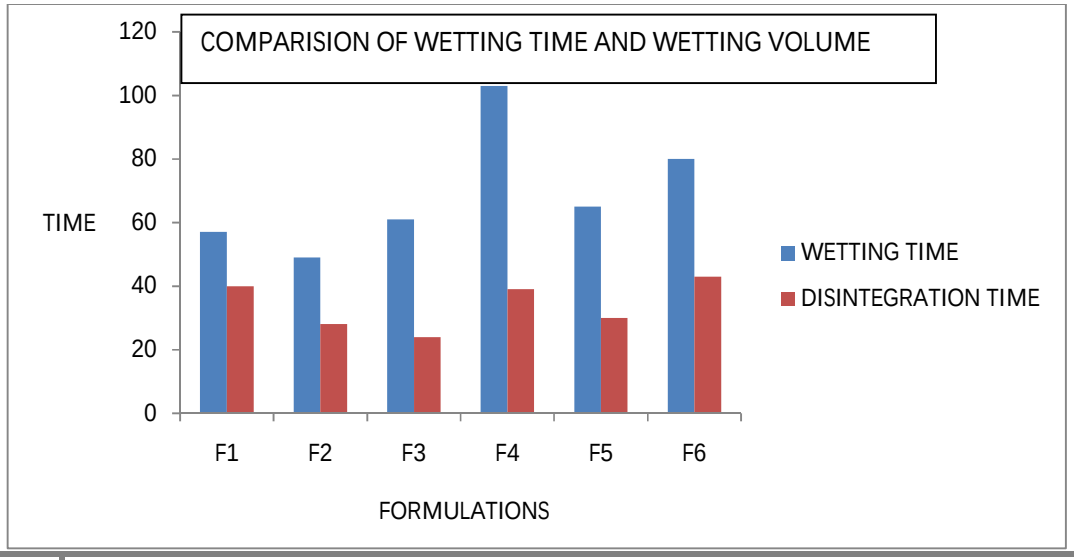


FIGURE 2

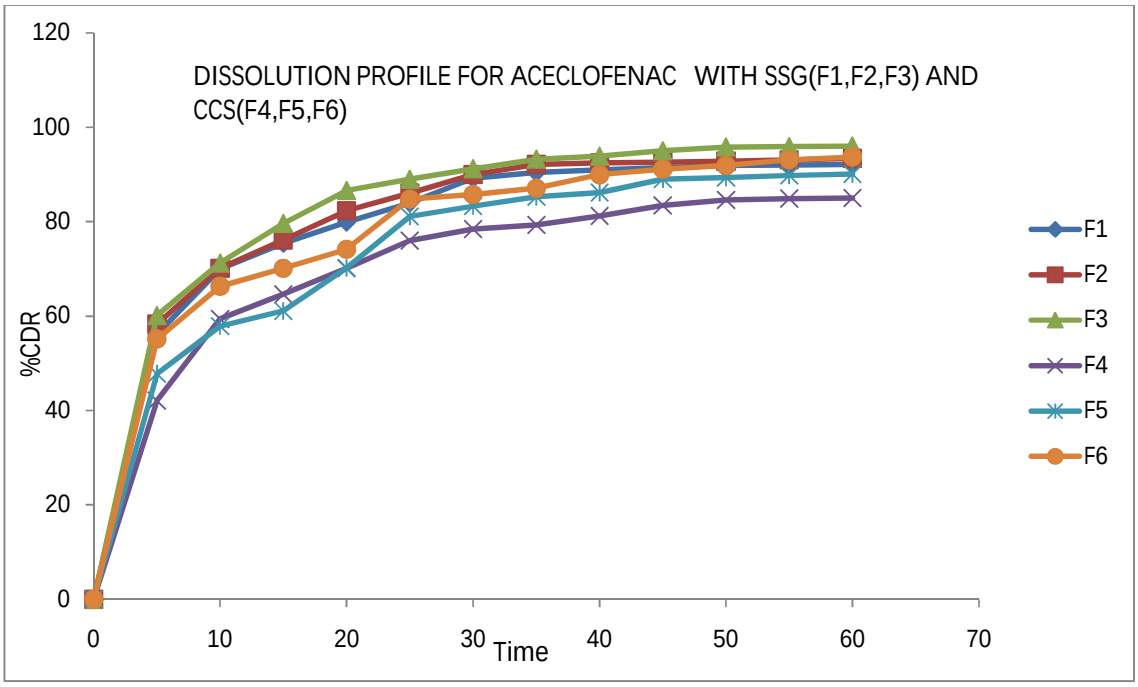
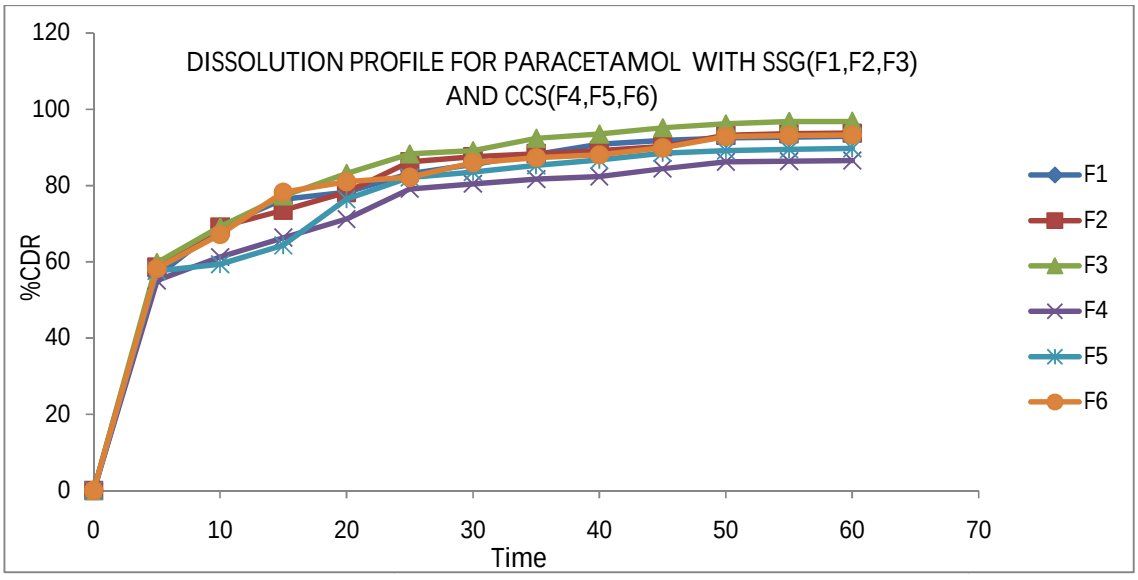


FIGURE 3



RESULTS AND DISCUSSION

The results reveal that all batches of aceclofenac with paracetamol rapimelts prepared by direct compression technique were within the limits for uncoated tablets as per Indian Pharmacopoeia. Hardness of tablets was found to be in range of 3.0 kg/cm^2 to 3.9kg/cm^2. Friability was observed between 0.61-0.72%. Thus the hardness and friability data indicates good mechanical resistance of tablets. The disintegration time was decreased when the concentration of primogel was 5%

per tablet (F2). Wetting time is determined to get idea of wetting lag time before disintegration. Wetting volume is done to check minimum volume of water required for wetting of tablets. By the mechanism of swelling primogel and ac-di-sol shows its disintegration effect. The formulation having 5% of primogel showed best results when compared to other formulations with Ac-di-sol. It was seen that almost 80% of drug was released in first fifteen minutes. Thus the release rate of aceclofenac with paracetamol rapimelts was significantly enhanced by formulating rapimelts by using superdisintegrants.

CONCLUSION

It was concluded that superdisintegrants addition technique is a useful method for preparing rapimelts by direct compression method. It is observed that optimized formulation (F2) which showed rapid disintegration contained 5% of primogel. Hence combination of aceclofenac with paracetamol rapimelts can be formulated by simple technique for effective in treatment of pain and inflammation and it can be administered without water for better patient compliance.

AKNOWLEDGEMENT

The authors are thankful to Dr.Shivamurthy Murugha Sharanaru, President, S.J.M Vidya Peetha for providing all necessary facilities through the Principal, S.J.M college of Pharmacy, Chitradurga and also thankful to Uforic Pharmaceuticals pvt. Ltd. Ankleshwar for providing the gift sample of aceclofenac and paracetamol.

REFERENCES

1. Rakesh Pahwa, Moan Piplani, Prabodh C Sharma, Dhirender KAushik and Sanju Nanda. Orally disintegrating tablets friendly to paediatrics and geriatrics. Arch Apl Sci Res. 2010;2(2):35-48
2. Sandeep Divate, Kunchu Kavitha, Ganesh Nanjan Sockan, fast disintegrating tablets – an emerging trend, IJPSRR, 2011; 6(2): 18-22.
3. Reeta Rani Thakur, Mridul Kashi**.** An unlimited scope for novel formulations as orally disintegrating systems: Present and future prospects. JAPS. 2011;1(1):13-14.
4. Tanmoy Ghosh, Amitava Ghosh, Devi Prasad. A review on new generation orodispersible tablets and its future prospective. Int J Pharm Sci. 2011;3(1):1-7.
5. V.Dhikav, S.Singh,K.S.Anand**.** Newer non-steroidal Anti-inflammatory Drugs- A review of their therapeutic potential and adverse drug reactions. JIACM.2002; 3(4):332-38.
6. Siraj Shaikh, Sayyed Nazim, Afsar Shaikh, Tarique Khan, Patel M. Siddik, Quazi Majaz, Shailesh Chalikwar, Design and characterization of orodispersible tablets of Aceclofenac, IJAPS. 2010; 1: 364-368.

7. Laurence.L.B,John.S.L,.Keith.L.P .Goodman and Gillman's, the pharmacological basis of therapeutics, Mcgraw hill Medical publishing division:2006,11th edition; 671-96.
8. Pawar V.T, Pisahwikar S.A, More H.N. Spectrophotometric estimation of aceclofenac and paracetamol from tablet dosage form. Curr Pharm Res. 2010;1(1):25-29.
9. Shaikh Siraj, Sayyed Nazim, Gomase Pravin,Shaikh Afsar, Quazi Majaz. Formulation and evaluation of aceclofenac fast dissolving tablets. IRJP. 2011;2(1):100-105.
10. Avani R. Gosai, Sanjay B.Patil and Krutika K .Sawant. Formulation and Evaluation of orodispersible tablet of ondansetron HCl by direct compression using super disintegrants. IJPSN. 2008;1(1):106-111.
11. Tejveer Kaur , Bhawandeep Gill, Sandeep Kumar, G.D. Gupta. Mouth Dissolving Tablets :A Novel Approach to Drug delivery. Int J Curr Pharm Res. 2011;3(1):1-7.

    P.S. Mohanchandran , P.G. Sindhumol ,T.S. Kiran. Superdisintegrants: an overview. IJPSRR. 2011;6(1):105-9.