International Journal of Pharmaceutical Research and Applications
Volume 6, Issue 6 Nov-Dec 2021, pp: 156-158 www.ijprajournal.com ISSN: 2249-7781

Formulation and Evaluation of Fast dissolving tablets of Clomipramine hydrochloride

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Date of Submission: 05-11-2021 Date of Acceptance: 20-11-2021

I. INTRODUCTION

Oral route of administration is the most popular method in drug administration. Fast dissolving tablets dissolves in patient mouth within a few seconds or chewing and aids in patient suffering from dysphagia. Some drugs are dissolved in mouth, pharynx and esophagus as the saliva passes down the stomach[1,2,3]. The various solid dosage forms like tablets, powders, capsules which can be administered orally. Specially in case of old age patients, paedetrics and bed ridden patients the drug cannot be given in oral dosage forms. Powders cannot be administered accurately might be spilled. With new approaches like mouth dissolving tablets and immediate release tablets have solved these problems to an extent[4,5,6]. Some drug get dissolved in pharynx and oesophagus hence the bioavailbility is increased. Clomipramine Hydrochloride is tricyclic antidepressants. It is used for treatment of obseesive compulsive disorder, panic disorder, major depressive disorder, and chronic pain. It is also effective in premature ejaculation.

II. MATERIALS AND METHODS

Clomipramine was supplied by Sigma Aldrich. Croscarmellose sodium and crospovidone was provided by Eden Pharma. All the ingredients provided was of pharmaceutical grade. Other materials and solvents was of analytical grade.

Table 1: Formulation of fast disintegrating tablet of Clomipramine

Formulation	F1	F2	F3	F4	F5	F6
Clomipramine	10	10	10	10	10	10
Avicel PH101	54	54	54	53	53	53
Starch	30	30	30	30	30	30
Crosscarmellose sodium	4			6		
Crosspovidone		4			6	
Sodium Starch Glycolate			4			6
Magnesium stearate	1	1	1	1	1	1
Talc	1	1	1	1	1	1
Total weight	100	100	100	100	100	100

Experimental Work:

The excipients was mixed uniformly excluding magnesium stearate and mannitol. The powder was then evaluated for various parameters such as thickness, hardness, friability and uniformity of weight, disintegraton time, wetting time, drug content and in vitro dissolution study.

Table 2: Evaluation of blend properties:

Formulation	Bulk Density	Tapped Density	Angle of Repose	Carr's Index	Haussner Ratio
F1	0.425±0.02	0.515±0.05	28.85±0.01	17.48%	1.21
F2	0.435±0.02	0.522±0.5	29.67±0.02	16.67%	1.20
F3	0.430±0.01	0.524±0.5	31.06±0.01	17.94%	1.22
F4	0.415±0.03	0.532±0.5	32.08±0.01	21.99%	1.28
F5	0.432±0.04	0.525±0.5	28.45±0.02	17.14%	1.20
F6	0.430±0.04	0.540±0.5	29.67±0.04	20.00%	1.25

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Thickness:
Vernier calipers was used to determine the thickness of tablets[7]. Five tablets from each batch were used and average value was calculated.

Hardness:
The hardness of tablets was determined using the Monsanto hardness tester.

Friability:
Twenty tablets were weighed and placed in the roche fibrialator and apparatus was rotated at 25 rpm for 4 minutes.

Uniformity of weight:
Twenty tablets were randomly selected from each batch individually weighed the average weight and standard deviation of 20 tablets was calculated.

Disintegration test:
Disintegration test was performed on disintegration apparatus. In dissolution medium 0.1N HCl, the tablets are placed.

Dissolution studies:
The USP dissolution testing apparatus II was used to calculate rate of release of Clomipramine. The dissolution test was performed using 900ml of 0.1N HCL at 37± 0.5 ºC and 100 rpm. 5ml of sample the solution was withdrawn from dissolution medium after every 2min for 30min. The samples were replaced with fresh dissolution medium[11,12]. Then the samples were filtered through watmann filter paper. The Absorbance of solution was noted at 273 nm using UV spectrophotometer. Drug release cumulative percentage was calculated.

Accelerated Stability Studies:
The tablets were placed at 40±2ºC and 75±5 %RH for duration of one month. After every month samples were periodically tested for various tests and drug release study.

Evaluation of fast disintegrating tablets:

Tablet thickness:
Thickness of formulation F1 to F6

Uniformity of weight:
Uniformity of weight was noted for all the tablets of each batch as per IP limits

Hardness:
The hardness was found to be in range of 3.54 ± 0.01 to 3.82 ± 0.01.

Friability:
The friability percentage was less than 1% . The values obtained lies within 0.498 to 0.417

Disintegration test:
Almost immediate disintegration was noted from tablet of each batch. With increase in concentration of the disintegrants, the disintegration time decreased. Crosspovidone showed better results rather than the croscarmellose sodium. It was due to the rapid uptake of water from the medium which resulted in swelling and burst effect. The disintegration time was inversely propotonal to crosspovidone concentration being used. When the concentration of croscarmellose sodium increases the disintegration time decreases.

Percentage drug content:
The drug content of the tablets were found to be between which was within acceptable limits.

Effects of disintegrants on release of Clomipramine:
Almost 100% of drug was released in all formulations 25,19,15,14 minutes respectively. Itt was observed from the various disintegrants such as Sodium Starch glycolate, croscarmellose sodium, crosspovidone.. Crosspovidone shows faster disintegration time as in comparison to others. It may be due to reason of high water uptake anf low gelling capacity of crosspovdone. When the concentration of crosspovidone increases there was decrease in disintegration time and increase in the dissolution of drug. Therefore formulation F5 having disintegrant crosspovidone in the concentration of 6% was the optimized formulation.

Table 3: Evaluation of physical properties of fast disintegrating tablets

Formulation	Thickness	Hardness	%Friability	DT (sec)	%drug content
F1	1.65±0.06	3.54±0.01	0.498	20.34±1.2	99.23±0.17
F2	1.61±0.06	3.53±0.04	0.470	17.66±0.82	99.45±0.02
F3	1.67±0.05	3.90±0.03	0.431	21.35±0.54	99.18±1.08
F4	1.62±0.05	3.80±0.04	0.476	17.67±0.67	99.56±1.12
F5	1.64±0.06	3.05±0.02	0.448	13.33±1.00	99.79±0.56
F6	1.61±0.06	3.82±0.01	0.417	18.67±0.75	98.79±0.56

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III. CONCLUSION:

Thus from above it can be concluded that the crosspovidone is having better disintegrant property than that of croscarmellose sodium and sodium starch glycolate and higher concemtration of crosspovidone gives better dissolutiuon and disintegration profile. Stability studies shows that there was no significant changes in hardness, friability, drug content and dissolution profile of the selected formulation. Thus crosspovidone can be successfully used in the formulation of fast disintegrating talets.

REFERENCES:

[1]. S.C. Porter. Am. Pharm Rev., 85, (2001) 28-35.
[2]. B.S. Kuchekar, A.C. Badhan, H.S. Mahajan, Pharma Times, 35 (2003) 1-8.
[3]. P. Mahaveer, M.K. Gupta, B. Anil, S. Natasha, A. Dilip, Der Pharmacia letter, 3, 2 (2011) 108-118.
[4]. S. Vijay, P. Anil, P. Kamal, AAPS Pharma Tech, 9, 1 (2008) 87-94.
[5]. R.N. Raghavendra, K.K. Ravi, C.M. Setty, R.K. Purushotham, Int. J. Pharm. Pharm. Sci., 1, 1 (2009) 79-87.
[6]. S.R. Levis, P.B. Deasy, Int. J. Pharm, 230 (2001) 25-33.
[7]. D.N. Mishra, M. Bindal, S.K. Singh, S.G.V. Kumar, Indian Drugs, 42, 10 (2005) 685-687.
[8]. L.H. Reddy, B. Ghosh. Indian J. Pharm. Sci, 64, 4 (2002) 1-3.
[9]. D. Bhowmik, B.K. Jayakar, S. Kumar. Int. J. Pharma. Rec. Res., 1, 1 (2009) 31-40.
[10]. G. Sameer, Yi-Ying Yu, K. Ajay. Int. J. Pharm., 365 (2009) 1
[11]. S. A. Sreenivas, P. M. Dandagi, A. P. Gadad et al., "Orodispersible tablet: new-fanged drug delivery system—a review,"Indian Journal of Pharmaceutical Education and Research, vol. 39, no. 4, pp. 177–181, 2005.
[12]. D. Bhowmik, B. Chiranjib, Krishnakanth, Pankaj, and R. M. Chandira, "Fast dissolving tablet: an overview," Journal of Chemical and Pharmaceutical Research, vol. 1, no. 1, pp. 163–177, 2009.