JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Formulation and Evaluation of Immediate Release Tablet on Hypertension

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Abstract: Now, the tablet is the most popular format because of its ease of self-management, productivity, and compactness. In some cases, more urgent action is required than with other treatments. Therefore, to overcome all the disadvantages, immediate-release tablets are used, which act very quickly after administration. Superdisintegrants used in development include polyplasdone, sodium starch glycolate, and cross-linked sodium carboxymethylcellulose. The main aim of this development is to improve the structure of the antihypertensive drug Olmesartan Medoxomil immediate-release tablets and to examine its evaluation and isolation. Equipment. The formulation is made by wet granulation. Dissolving olmesartan medoxomil in aqueous sodium hydroxide solution converts olmesartan medoxomil to its sodium salt, increasing drug release and product stability. Starch paste in distilled water is used as a binder. Crospovidone was used as a superdisintegrant. Lactose monohydrate and magnesium stearate were used as diluent and lubricant, respectively. Most cardiovascular diseases, such as high blood pressure and angina, require constant monitoring. Hypertension was defined as primary hypertension or secondary hypertension.

Keywords: Immediate Release, Polyplasdone, Superdisintegrant

I. INTRODUCTION

INTRODUCTION

A tablet is defined as a dosage form containing a drug, with or without suitable diluents, prepared by compression or molding. Tablets come in different shapes such as round, oval, cylindrical, triangular or oval. Depending on the chemicals in them, their size and weight will vary. High blood pressure (HTN or HT), also known as high blood pressure (HBP), is a chronic condition in which the blood pressure in the arteries is elevated. It usually does not cause symptoms. Diuretics, angiotensin converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs), and calcium channel blockers are all used to treat high blood pressure. Olmesartan Medoxomil is an angiotensin II receptor blocker used in the treatment of hypertension and heart disease. Patients with heart failure are recommended to take it orally and last at least one day. Among all methods, the oral method is the most preferred for use in patients.

Olmesartan Medoxomil selectively binds to the AT1 angiotensin II receptor, blocking the vasoconstrictive and aldosterone-releasing effects of angiotensin II. It relaxes blood vessels and lowers blood pressure. so, blood flows better from different organs and makes the heart beat better. Olmesartan reduces renal vascular resistance. Oral olmesartan medoxomil 10-40 mg daily is recommended for the treatment of hypertension in adults. Extensive evidence from several large studies and clinical trials confirms the antihypertensive efficacy and efficacy of oral olmesartan medoxomil as monotherapy or in combination with HCTZ in people with high blood pressure.

Materials and Methods:

Materials:

Ingredients	Category
Olmesartan Medoxomil	Drug/ API
Crospovidone	Disintegrating Agent
Starch	Binder
Povidone	Binding Agent
Talc	Glidant
Mg Stearate	Lubricant
Lactose Monohydrate	Diluent

Methods:

The conventional techniques used in the preparation of tablets are as follows:

1. Tablet Molding Technique
2. Direct Compression Technique

3. Granulation Technique
4. Mass Extrusion Technique

Formulation of Immediate Release Olmesartan Medoxomil tablet:

Step 1: Sifting of Raw Materials:

Olmesartan and Crospovidone weighed accurately and pass through the mesh number 44.

Step 2: Preparation of binder solution:

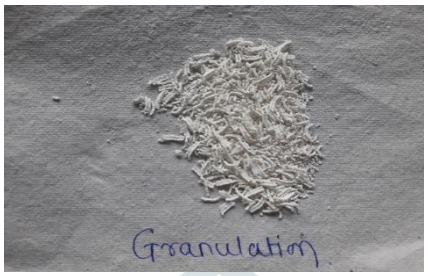
Starch and Povidone were taken into beaker and by adding distilled water side by side paste is prepared of appropriate thickness.

Step 3: Wet Granulation:

Transfer the sifted Olmesartan and Crospovidone into mortar pestle and add a prepared paste of starch side by side in the ingredients of mortar pestle and form a coagulant mass. Then pass the coagulant mass through sieve no 22 and granules were prepared.

Step 4: Drying:

Prepared granules were placed into a hot air oven for 5 to 10 minutes at 60° C.



Step 5: Sifting of extra granular materials:

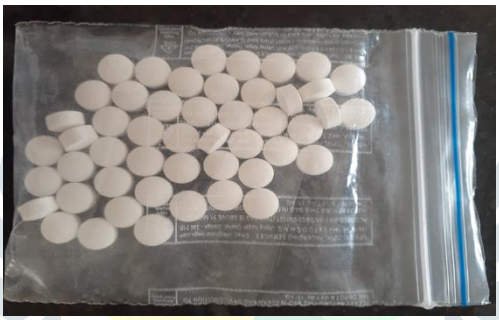
Other excipients like Crospovidone, povidone, lactose monohydrate, starch, talc, magnesium stearate was sifted to mesh size 44.

Step 6: Blending:

All the excipients and granules were blended together for 5-10 minutes.

Step 7: Compression:

Tablet machine was fixed with D type 8 mm die and punch. Lubricated granules were then compressed into 8 Station rotary tablet punching machine.



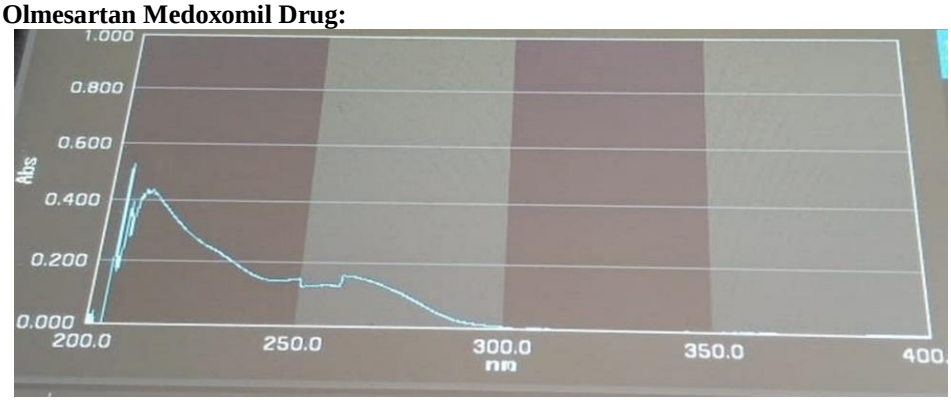
Formulation Table:

Ingredients	F1	F2	F3	F4	F5
Olmesartan Medoxomil	40	40	40	40	40
Crospovidone	40	-	60	48	55
Starch	-	25	-	32	-
Povidone	20	-	-	-	32
Talc	12	48	-	-	55
Mg Stearate	-	22	40	-	68
Lactose Monohydrate	138	115	110	130	-
Total weight	250	250	250	250	250

Evaluation Of Immediate Release Tablet of Olmesartan Medoxomil:

Preformulation Study:

UV Visible Spectrum of Olmesartan Medoxomil Drug:



Precompression Profile:

Table: Precompression Study of Immediate Release Tablet

Formulation	Bulk Density (gm/ml)	Tapped Density (gm/ml)	Hausner Ratio	Angle Of Repose (degree)
F1	0.443	0.568	1.282	31.4
F2	0.449	0.558	1.242	32.3
F3	0.432	0.643	1.292	31.2
F4	0.488	0.579	1.317	27.2
F5	0.473	0.583	1.224	28.9

Post compression Profile:

Table: Hardness of Olmesartan Medoxomil Tablet for Different Formulations

Sr No.	Formulation	Hardness (Kg/cm2)
1	F1	5.20
2	F2	5.60
3	F3	6.00
4	F4	5.40
5	F5	4.64
6	F6	6.20
7	F7	5.09
8	F8	5.32
9	F9	5.29
10	F10	5.40

Table: Thickness of Olmesartan Medoxomil Tablets for Different Formulations

Sr. No	Formulation	Thickness (mm)
1	F1	4.11
2	F2	4.15
3	F3	4.24
4	F4	4.31
5	F5	4.29
6	F6	3.95
7	F7	4.07
8	F8	4.16
9	F9	4.19
10	F10	4.26

Table: Friability of Olmesartan Medoxomil Tablets for Different Formulations

Sr. No	Formulation	Friability Of Tablets (%)
1	F1	0.79
2	F2	0.75
3	F3	0.68
4	F4	0.81
5	F5	0.83
6	F6	0.73
7	F7	0.65
8	F8	0.77
9	F9	0.66
10	F10	0.80

Table: Average Weight of Olmesartan Tablets for Different Formulations

Sr No	Formulation	Average Weight of Tablets (mg)
1	F1	233
2	F2	227
3	F3	240
4	F4	230
5	F5	260
6	F6	250
7	F7	270
8	F8	268
9	F9	272
10	F10	265

Table: Disintegration Time of Olmesartan Medoxomil Tablets for Different Formulations

Sr. No	Formulation	Disintegration Of Tablets (min)
1	F1	2.27
2	F2	2.08
3	F3	1.45
4	F4	1.52
5	F5	1.06
6	F6	1.02
7	F7	0.51
8	F8	0.41
9	F9	0.47
10	F10	0.53

Table: Standard Curve of Olmesartan Medoxomil in 0.1N HCl (pH 1.2) Buffer Medium:

Sr No	Concentration	Absorbance at 650 nm
1	0	0
2	5	0.186
3	10	0.345
4	15	0.522
5	20	0.715

Table: In Vitro Dissolution Profile of Formulation F1 In 0.1N HCl (pH 1.2) Buffer Medium

Sr No	Times In Minutes	Cumulative Percentage of Drug Released
1	0	0
2	15	34.4

3	30	50.7
4	45	70.4
5	60	83.1

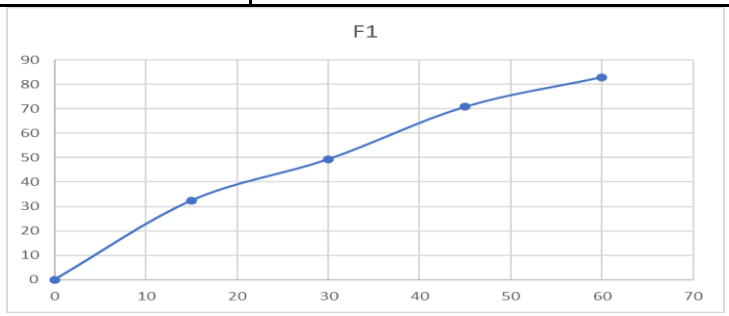


Table: In Vitro Dissolution Profile of Formulation F2 In 0.1N HCl (pH 1.2) Buffer Medium

Sr No	Time In Minutes	Cumulative Percentage of Drug Released
1	0	0
2	15	31.3
3	30	49.1
4	45	71.5
5	60	82.4

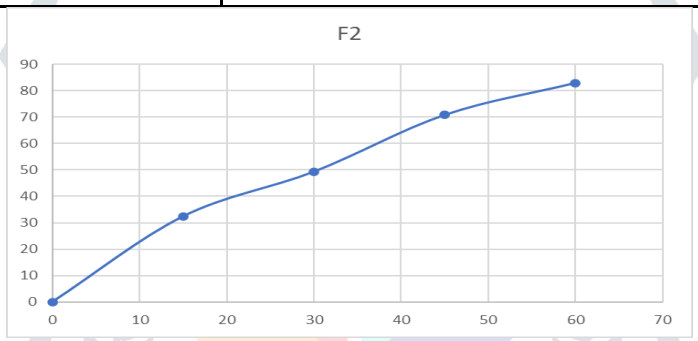


Table: Invitro Dissolution Profile of Formulation F3 In 0.1N HCl (pH 1.2) Buffer Medium

Sr No	Time In Minutes	Cumulative Percentage of Drug Released
1	0	0
2	15	35.2
3	30	51.4
4	45	68.7
5	60	83.5

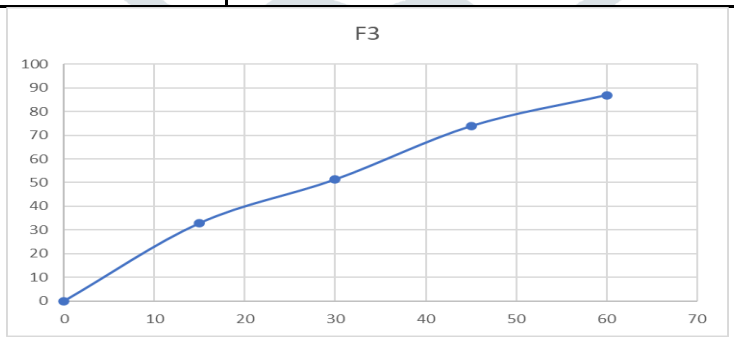


Table: In Vitro Dissolution Profile of Formulation F4 In 0.1N HCl (pH 1.2) Buffer Medium

Sr No	Time In Minutes	Cumulative Percentage of Drug Released
1	0	0
2	15	32.6
3	30	51.1
4	45	73.2
5	60	86.5

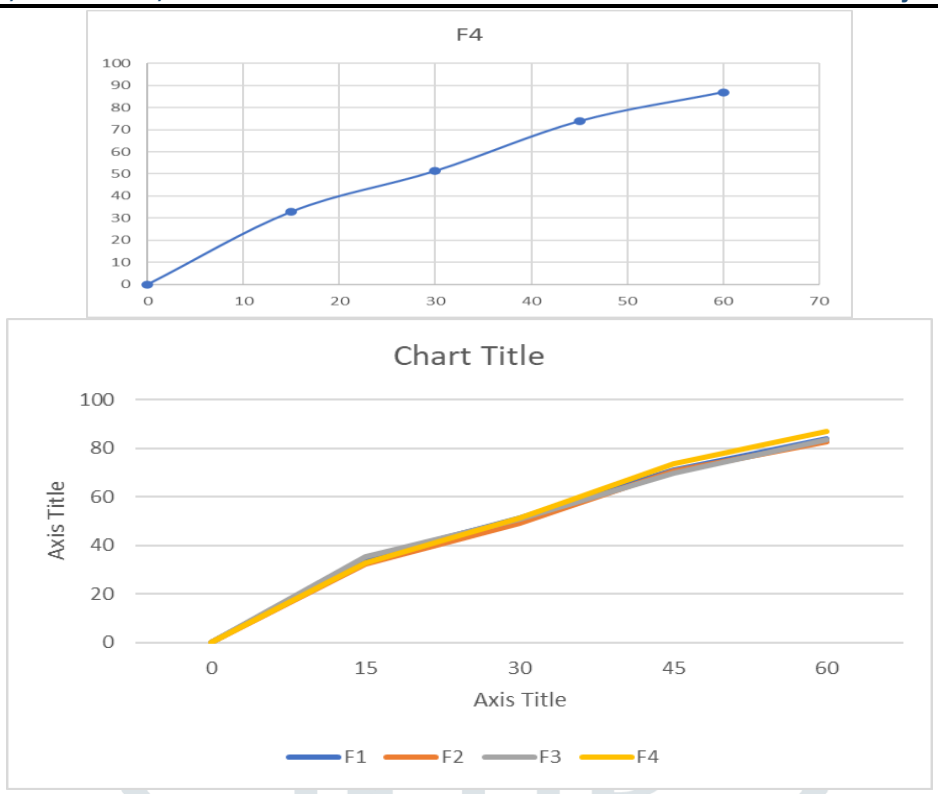


Fig: Comparison of In-Vitro Dissolution Profiles of All Formulations (F1 To F4) To the Innovator In 0.1N HCl (pH 1.2) Buffer Medium

Conclusion: A total of olmesartan medoxomil tablets were prepared with French granulation with a good profile, using lactose monohydrate as diluent, povidone as binder, Crospovidone as super-disruptor, talcum powder as lubricant, magnesium stearate or stearic acid as lubricant. Up to 1 hour in the specified time. The granules were compressed into tablets and analyzed for parameters such as average weight, friability, thickness, hardness, disintegration and dissolution analysis. Formulations containing Crospovidone showed faster disintegration and dissolution rates compared to other formulations. The F8 tablet has a short burst time (0.41 minutes). F8 has better output than other models, so F8 is a better product design. Compatibility studies have been performed on the body combination and the drug has been shown to be compatible with all excipients used in different formulations.

References:

1. Mallion JM, Omboni S, Barton J, Van Mieghem W, Narkiewicz K, Panzer PK, et al., 2011. Antihypertensive efficacy and safety of Olmesartan and ramipril in elderly patients with mild to moderate systolic and diastolic essential hypertension'. Blood Press, Volume 20, Suppl 1. Page 3-11.
2. Mire DE., 2005. A Review of the Structural and Functional Features of Olmesartan Medoxomil, An Angiotensin Receptor Blocker. J Cardiovasc Pharmacol, Volume 46, Issue 5, Page 585-593.
3. Miyoshi T. Doi M. Hirohata S, Kamikawa S. Usui S, Ogawa H. et al., 2011."Olmesartan reduces arterial stiffness and serum adipocyte fatty acid-binding protein in hypertensive patients. Heart Vessels, Volume 26, Issue 4, Page 408-413.
4. Mukesh Gohel, Madhabhai Patel, Avani Amin, Ruchi Agrawal, Ritika Dave and Nehal Bariya., 2004. Formulation design and optimization of mouth dissolve tablets of nimesulide using vacuum drying technique", Aaps Pharm Sci Tech, Volume 5, Issue 3. Page 10-15.
5. Neutel JM, Elliott WJ, Izzo JL., 2002. Antihypertensive Efficacy of Olmesartan Medoxomil, a New Angiotensin II Receptor Antagonist, as Assessed by Ambulatory Blood Pressure Measurements. J Clin Hyper, Volume 4, Page 325-331