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Research Article

Trazodone-Immediate Release Tablets by using Natural and Synthetic Super Disintegrants

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Abstract

The present study was an attempt to formulate and evaluate immediate release tablets of an ant-depressant drugs Trazodone hydrochloride. Preformulation studies were carried out during the early stages of this work. It has found that Trazodone hydrochloride is having maximum absorption at wavelength 248 nm. The organoleptic characteristics, solubility, particle analysis, BD, TD, CI and HR of the drug were done. The photostability study and forced degradation study of the drug shows above 99% purity. The drug-polymer compatibility study was carried out to determine the interactions between the drug and the polymers used in the study. The IR spectra revealed that polymers and excipients used were compatible with drugs. The Immediate release/Fast dissolving tablets were formulated using Sodium starch glycolate as super disintegrant by wet granulation technique. Prepared tablets were evaluated for Pre-compression Parameters and Post compression parameters. Flow properties–Angle of repose, loose bulk density, tapped density, %Carr's compressibility and also Hausner's ratio was determined to all the formulations which showed good flow property. The shape and colour of all formulations were found to be round in shape and white in colour. The thickness found uniform in all formulations except the formulation F1 and F2. Amongst all the developed formulations, Trazodone hydrochloride immediate release tablets formulated by using sodium starch glycolate as super disintegrant, MCC pH 102 as diluent and pregelatinized starch as binder shows hardness (85 ± 10 N), Friability (NMT 1%), thickness (4.5 ± 0.1 mm), Diameter (9.52 ±0.02) and it is fulfilling all the parameters. All formulations shown good in vitro disintegration time (4510 sec). This indicates rapid disintegration. Also in all formulations, the %Cumulative drug release is not less than 85% in 15 minutes. Stability studies were conducted for formulation F3 at 400 C/75% RH and 60^0C for 3 months.

Keywords: Trazodone, Crospovidone, Gellan gum and Locust Bean Gum.

Article Info

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Contents

1. Introduction

The term "immediate release" pharmaceutical formulation includes any formulation in which the rate of release of drug from the formulation and/or the absorption of drug, is neither appreciably, nor intentionally, retarded by galenic manipulations. In the present case, immediate release may be provided for by way of an appropriate pharmaceutically acceptable diluents or carrier, which diluents or carrier does not prolong, to an appreciable extent, the rate of drug release and/or absorption[5]. Thus, the term excludes formulations which are adapted to provide for "modified", "controlled", "sustained", "prolonged", "extended" or "delayed "release of drug.

2. Methodology

Preformulation studies:

Determination of absorption maximum (λ_{max}):

Construction of Trazodone calibration curve with phosphate buffer pH 6.8: 100mg of Trazodone was "dissolved in 100ml of phosphate buffer pH 6.8 to give a concentration of 1mg/ml (1000µgm/ml). From the above standard solution (1000µgm/ml) 10 ml was taken and diluted to 100ml with phosphate buffer pH 6.8 to give a concentration of 100µgm/ml." From "this stock solution aliquots of 0.2,0.4,0.6,0.8 and 1ml were pipette out in 10ml volumetric flask and the volume was made up to the mark" with "phosphate buffer PH 6.8 to" produce "concentration of 2,4,6,8 and 10 µgm/ml respectively. The absorbance (abs) of" each "conc. was measured at respective" (λ_{max}) i.e., 258 nm.

Drug- excipient compatibility studies by FT-IR:

Flow properties:

- Angle of Repose
- Loose bulk Density (LBD)
- Tapped density (TD)
- Carr's consolidation index
- Hausner's ratio

Formulation of Immediate release tablets of Trazodone:

Preparation of tablets:

Composition of" Trazodone Immediate release Tablet by direct compression. "All the ingredients were weighed." Required "quantity of drug and excipient" mixed "thoroughly in a polybag. The" blend "is compressed using rotary tablet" machine-8 station with 5mm flat punch, "B tooling. Each tablet contains" 12.5 mg Trazodone and other pharmaceutical "ingredients. Total weight of tablet" was found to be 60 mg.

Post compression parameters:

Evaluation of uncoated tablets:

- Shape and colour
- Uniformity of thickness
- Hardness test
- Friability test
- Weight variation test
- Drug Content estimation

***In -vitro* dissolution studies:**

In-vitro release studies were carried out using a modified USP XXIII dissolution "test apparatus (Lab India, DS-800)." The dissolution fluid was 900ml of phosphate buffer pH 6.8 at "a speed of 50rpm at a temperature of 37^0c were used in each test. Samples of dissolution medium (5ml) were withdrawn for every" 2min and assayed for Trazodone by measuring absorbance at 258 nm. "For all the tests 5ml of the test medium were collected at specified time intervals and replaced" with same volume of phosphate buffer pH 6.8. Details:

Apparatus used : "USP II Lab India" DS 800
Dissolution Medium : Phosphate buffer PH 6.8
Dissolution Medium volume : 900ml
Temperature : "37^0C
Speed of paddle" : 50rpm
Sampling Intervals : 2, 4, 6, 8, 10, 15, 20, 30, 45 & 60 min
Sample withdrawn : 5ml
Absorbance measured : 258 nm
Beers Range : 2-10µg/ml

3. Results and Discussion

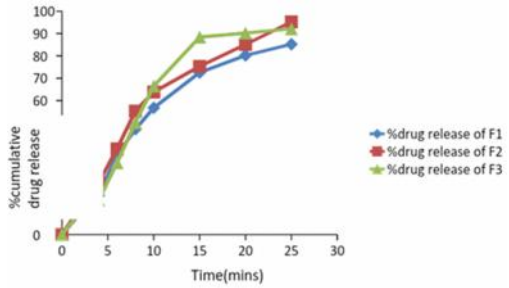

Figure 1: Dissolution profile of formulations prepared with Cross povidone

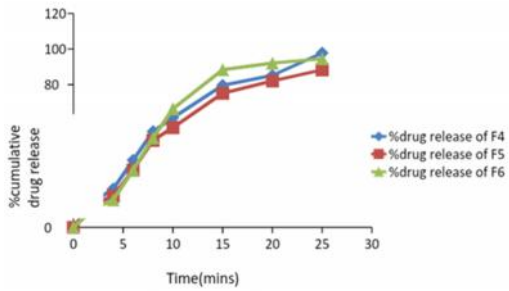

Figure 2: Dissolution profile of formulations prepared with Gellan gum

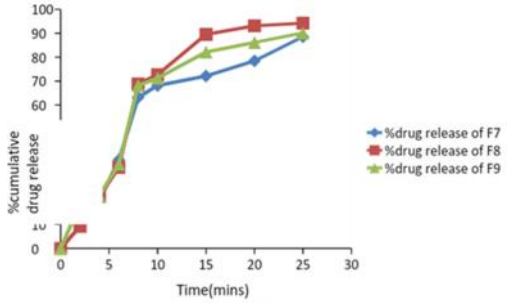

Figure 3: Dissolution profile of formulations prepared with Locust bean gum

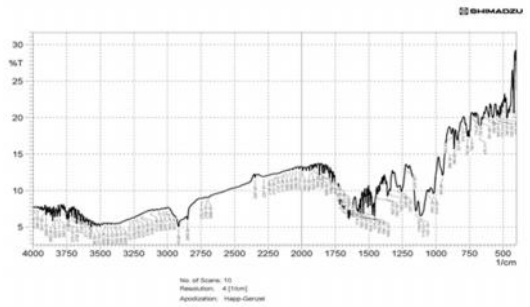

Figure 4: FT-IR spectrum of pure drug

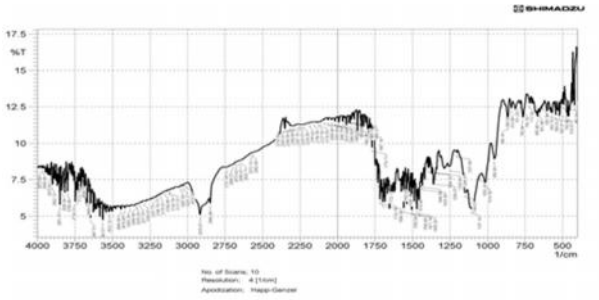

Figure 5: FT-IR spectrum of optimized formulation

Table 1: "Composition of various tablet formulations"

Ingredients	F1	F2	"F3	F4	F5	F6	F7"	F8	F9
Trazodone (mg)	50	50	50	50	50	50	50	50	50
Cross povidone(mg)	25	50	75	-	-	-	-	-	-
Gellan gum(mg)	-	-	-	25	50	75	-	-	-
Locust bean gum(mg)	-	-	-	-	-	-	25	50	75
Magnesium Stearate(mg)	3	3	3	3	3	3	3	3	3
Talc(mg)	3	3	3	3	3	3	3	3	3
MCC(mg)	Qs	Qs	Qs	Qs	Qs	Qs	Qs	Qs	Qs
Total wt(mg)	200	200	200	200	200	200	200	200	200

Table 2: Pre-compression parameters

Formulations	Bulk Density (gm/cm^2)	Tap Density (gm/cm^2)	Carr's Index (%)	Hausner ratio	Angle of Repose(Θ)
F_1	0.43	0.58	19.17	1.16	29.34
F_2	0.47	0.55	13.55	1.19	26.71
F_3	0.49	0.58	12.69	1.16	29.34
"F_4	0.46	0.55	14.54	1.17"	28.23
F_5	0.50	0.58	13.79	1.16	29.34
F_6	0.47	0.52	19	1.16	26.78
F_7	0.47	0.50	19	1.21	26.78
F_8	0.41	0.50	15.31	1.28	28.14
F_9	0.50	0.53	18.14	1.24	26.48

Table 3: In-vitro "dissolution studies of all formulations"

Time	"F1	F2	F3	F4	F5"	F6	F7	F8	F9
2	9.77	12.14	10.32	14.21	13	10.32	11.32	9.21	18.51
4	17.51	23.16	15.45	21.55	17.5	15.45	20.15	21.8	22.15
6	35.64	38.46	32.15	37.64	32.11	32.15	36.97	33.87	35.23
8	47.21	55.31	50.11	53.74	48.79	50.11	63.17	68.82	68.14
10	56.74	63.84	66.47	61.47	55.94	66.47	68.14	72.64	71.24
15	72.54	75.32	88.41	79.64	75.21	88.41	72.11	89.54	82.14
20	80.21	85.11	90.21	85.21	82.1	92.11	78.45	93.11	86.14
25	85.22	95.21	92.14	97.75	88.34	94.54	88.54	94.22	90.14

4. Conclusion

In the present work, an attempt has been made to develop Immediate release tablets of Trazodone. "Among all the formulations F4" formulation showed maximum % drug release i.e., 97.75 % in 25 "min hence it is considered as optimized formulation. The F4 formulation" contains Gellan gum as super "disintegrate in the concentration of" 25 mg.

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