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ANALYTICAL METHOD DEVELOPMENT OF BICALUTAMIDE TABLET FOR DISSOLUTION TEST

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ABSTRACT

The present work is concerned with the objective to develop and validate a new simple, rapid, efficient, reliable and economic method for analysis of dissolution characters of bicalutamide tablets which is a non steroidal anti-androgen.A literature review reveals that only pharmacologically and spectrophotometric determination have been reported in the bulk drug and in its dosage form .It shows absorption maximum at 272 nm in the range 6-15µg.Hence analytical method for dissolution of bicalutamide 50mg tablet was developed using multiple point standardization method, where method used met the parameters such as specificity, precession, linearity, range as per ICH guidelines.

Key words: Bicalutamide, Dissolution, Analytical.

INTRODUCTION

Chemically[1-4], bicalutamide is a (+) –N-[4-cyno-3-(trifluoromethyl)phenyl]-3-[(4-fluorophenyl) sulfonyl]-2-hydroxy-2-methyl propanamine. It is used as anti-androgen[5,6] in the treatment of prostate cancer[7] where it competitively inhibits the action of androgens by binding to cytosol androgen receptors in the target tissue. It is insoluble in water[8] but well absorbed through oral administration. It is highly protein bound (90%). A literature review[8-10] reveals that only pharmacologically, this drug has been reported in the bulk drug and in its dosage form. It shows absorption maximum at 272 nm in the range 6-15 µg. Hence, analytical method for dissolution of bicalutamide 50 mg tablet was developed using multiple point standardization method, where method used met the parameters such as specificity, precession, linearity and range as per ICH guidelines[11]. Hence, the proposed method was simple, sensitive and rapid and economical in all respects.

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EXPERIMENTAL

U.V Spectrophotometer (Shimadzu U.V 1601 and Viran U.V), USP Type II dissolution apparatus, Whatman filter paper No. 41, sodium lauryl sulphate 1%, bicalutamide and methanol.

Table 1: Experimental conditions for dissolution

Parameters	Conditions
Apparatus	USP Type II
Speed	75 rpm
Dissolution medium	1% Sodium lauryl sulphate
Volume	1000 mL
Temperature	35 ± 0.5^{o}C
Time	60 min

Standard solution preparation

50 mg Bicalutamide was weighed accurately and working standard was prepared in 100 mL volumetric flask and made up to the volume with methanol. Further 2 mL of the stock solution was diluted to 100 mL with 1% sodium lauryl sulphate.

Preparation of sample solution

A 50 mg tablet was taken randomly for analysis, which was diluted with 1000 mL 1% sodium lauryl sulphate. 5 mL Solution was then transferred to 25 mL 1% sodium lauryl sulphate solution to get a concentration of 10 µg/mL.

Assay

At the end of the standard time interval, 10 mL aliquot of each specimen from zone midway between the surface of the dissolution medium and top of the paddle and not less than 1 cm from the vessel wall was filtered through Whatman filter paper No. 41. 5 mL of this solution was diluted to with 25 mL dissolution medium (1% sodium lauryl sulphate). They were measured at 272 nm on U.V using standard and sample solutions against the blank (1% sodium lauryl sulphate). The amount of bicalutamide release in percentage was calculated (Table 1).

RESULTS AND DISCUSSION

The validation parameters results are presented in Table 3. The specificity was not more than 0.005. The % RSD for the sample and standard solutions was found to be 0.3% and 0.3%, respectively, which was not more than the acceptance criteria. The regression analysis using method of least squares was made for the intercept and correlation form different concentrations and the results are summarized in Table 2. The data for range was scanned separately at 272nm and were found to be within the limits of 2%.Hence the proposed method was found to be simple, sensitive, selective, economical, accurate and precise and also met all the validation parameters required for dissolution such as specificity, precession, linearity, range as per ICH guidelines. Hence the method used stands validated.

Table 2: Data for dissolution of bicalutamide (50 mg) tablets

S. No.	Absorbance sample	% Release
1	0.514	100.4
2	0.515	100.6
3	0.514	100.6
4	0.514	100.4
5	0.515	100.6
6	0.514	100.4
Mean	0.514	100.4
% RSD	0.1	0.1

Table 3: Validation parameters

Validation parameters	Preparations	Expt. values	Acceptance criteria	Inference
specificity	1 > Blank (1% SLS) 2 > Placebo 2 > Resolution	1 > 0.000 2 > 0.003 2 > 0.515	Blank and placebo should be NMT 0.005	Complies

Cont…

Validation parameters	Preparations	Expt. values	Acceptance criteria	Inference
Precession	1 > Standard 2 > sample	% RSD at 272 nm 1 > 0.3 2 > 0.3	1 > Standard NMT 2% 2 > Sample NMT 10%	Complies
Range	1 > Level 1 solution (0.0015 mg/mL 2>Level 7 sokution (0.015 mg/mL)	% RSD at 272 nm 1 > 0.1 2 > 0.7	% RSD NMT 2%	Complies
Linearity	1 > linearity regression coefficient 2 > % Y intercept	1 > 0.999 2 > 1.39	1 > NMT0.999 2 > -2 to ± 2.	Complies

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