Research Article

Quantitative Spectrophotometric Determination of Citalopram in Tablet Formulation Using Urea as Hydrotropic Solubilizing Agent

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ABSTRACT
A simple, safe and sensitive spectroscopic determination of Citalopram Hydrobromide in UV region was developed using 8 M urea solution as hydrotropic solubilising agent. Citalopram showed λ-max at 239 nm and beer's law was obeyed in the concentration range of 5 – 25 µg/ml. The results of analysis have been validated statistically and by recovery studies.

Keywords: Spectrophotometry, Citalopram Hydrobromide, hydrotrophy.

INTRODUCTION

Citalopram is a selective and potent serotonin reuptake inhibitor with a very broad spectrum of therapeutic activity against depression, anxiety, obsessive and impulse control disorders[1-2]. Literature survey reveals that the drug can be estimated by spectrophotometric methods[3-7], voltammetric determination[8], rapid chromatographic[9] and RPHPLC method[10] in plasma. In the present investigation, hydrotropic solubilizing agent, 8 M urea was employed to solubilize citalopram from the fine powder of its tablets to carryout spectrophotometric analysis.

EXPERIMENTAL METHODS

Apparatus

T60 UV - Visible Spectrophotometer with 1 cm matched quartz cells were used for all spectral measurements. Digital Balance: BL - 220H, Shimadzu was used.

Procedure

Citalopram Hydrobromide (50 mg) was accurately weighed and transferred in a 100 ml volumetric flask and 50 ml of 8 M urea was added and the drug was solubilized by shaking the flask. The volume was made up to the mark with distilled water. The stock solution was further diluted with distilled water to obtain various dilutions. Standard solutions of 5, 10, 15, 20 and 25 µg/ml of drug were used to plot the calibration curve by taking the absorbance at 239 nm which is the lambda max of the drug (Fig. 1), against corresponding reagent blanks.

Analysis of tablets

Twenty tablets of citalopram were weighed and finely powdered. Powder equivalent to 50 mg of citalopram was accurately weighed and transferred to a 100 ml volumetric flask. To it, 50 ml of, 8 M urea solution was added. The flask was shaken briskly for 20 minutes and then volume was made up to the mark with distilled water. After filtration through Whatmann filter paper, the filtrate was appropriately diluted with distilled water and absorbance was noted at 239 nm against reagent blank. The drug content was determined using the calibration curve.

RESULTS AND DISCUSSION

The regression analysis was made; slope (m), intercept (b) and correlation obtained

from different concentrations and the results are summarized in Table 1. Tablets containing citalopram were successfully analyzed by the proposed method. The results are represented in Table 2. The method was validated for linearity, accuracy and precision. To ensure the accuracy and reproducibility of the results obtained, recovery experiments were performed by adding known amounts of pure drug to the previously analysed formulated samples and these samples were reanalyzed by the proposed method. The percentage recoveries thus obtained were given in Table 2. None of the excipients usually employed in the formulation of tablets interfered in the analysis of citalopram, by the proposed method.

CONCLUSION

The proposed method of analysis is novel, simple, cost-effective, environment friendly, reproducible. This method can be routinely employed in the analysis of citalopram in tablet formulations precluding the use of organic solvent.

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Table 1: Optical characteristics of proposed method

Parameters	Values
λ_{max} (nm)	239
Beer's law limit (µg/ml)	5-25
Sandell's sensitivity (µg/cm^2/0.001 absorbance unit)	2.619×10^{-2}
Molar absorptivity (l/mol/cm)	1.2386×10^4
LOD (µg mL^{-1})	0.1273
LOQ (µg mL^{-1})	0.3819
Regression equation (Y = mx + b) Slope (m) Intercept(b)	 0.0379 0.0012
Correlation coefficient (r^2)	0.999

Table 2: Assay results, recovery and precision studies

Sample	Labeled amount (mg/ tablet)	(%) label claim* ± S.D	%Recovery	Precision S.D	
				Inter-day (n=18)	Intra-day (n=6)
Citalopram HBr Tablets	20	99.74 ± 0.681	99.66 -100.37%	1.008	0.681

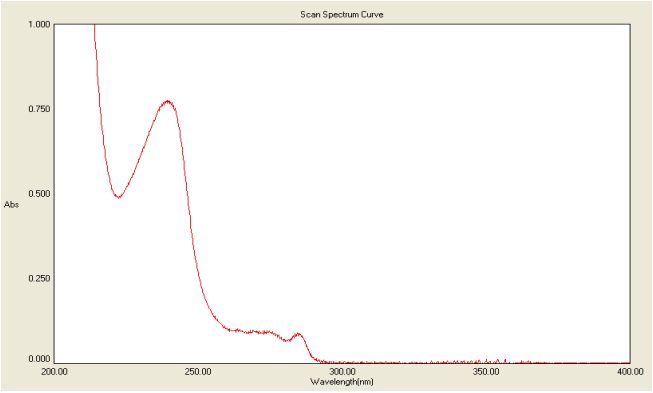

Fig. 1: UV spectrum of Citalopram Hydrobromide in 8 M Urea

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