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Research Article

UV SPECTROPHOTOMETRIC METHOD FOR DETERMINATION OF ONDANSETRON HYDROCHLORIDE IN PURE AND ITS FORMULATION

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ABSTRACT

A simple, rapid, precise, accurate and sensitive analytical method was developed for the UV spectrophotometric assay of ondansetron. The drug obeyed the Beer's law and showed good correlation. It showed absorption maxima at 248 nm in saline. The linearity was observed between 5 – 25 µg mL^{-1}. The results of analysis were validated by recovery studies. The recovery was more than 99%. The proposed method can be used for the routine quality control testing of the marketed formulations.

Keywords: Uv spectrophotometry, Ondansetron hydrochloride, Saline, Tablets.

INTRODUCTION

Ondansetron hydrochloride is chemically 1, 2, 3, 4–tetrahydro- 9-methyl- 3- (2-methylimidazol- 1- yl methyl) carbazol-4-one hydrochloride is a selective 5HT3 receptor antagonist[1]. A survey of literature revealed Spectrophotometric methods[2-5] and HPLC methods for the estimation of drug[6-10]. The aim of the study was to develop a simple, precise and accurate spectrophotometric method for the estimation of ondansetron hydrochloride in pure and in its pharmaceutical dosage form.

MATERIALS AND METHODS

Instrumentation

The spectrophotometric measurements were carried out using an Elico UV/Visible double beam spectrophotometer SL-210 with 1 cm matched quartz cells. Digital Balance: BL-220H, Shimadzu was used.

Chemicals

Pure Ondansetron hydrochloride was obtained as a gift sample from Aurobindo Pharma, (Hyderabad, India). Commercial tablets were purchased from the local market. All other chemicals and solvents used were of analytical grade.

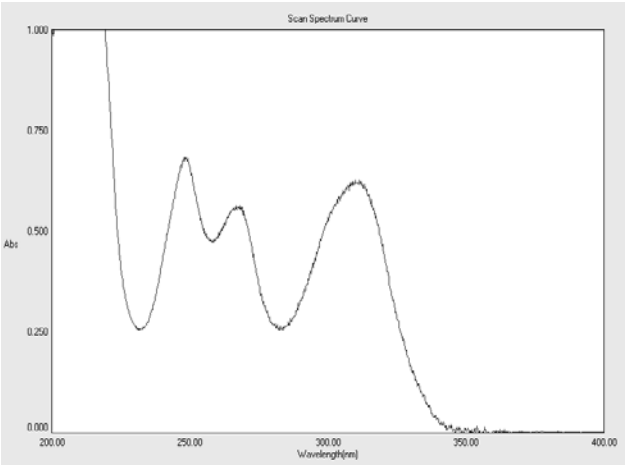

Fig. 1: UV spectrum of ondansetron hydrochloride in saline.

Procedure

100 mg of the drug was weighed accurately and transferred in to a 100 mL volumetric flask, to that 25 mL of saline was added and shaken well, after complete dissolution the volume was made up to 100 mL using saline. This dilution was treated as stock solution which is having 1000 µg/mL of ondansetron hydrochloride. From the above solution the suitable quantity of aliquots were taken into a series of 10 mL standard flasks to get 5,10,15,20 and 25 µg/ml of ondansetron and volume was made up to 10 mL using distilled water. The prepared solutions were scanned between 200-400 nm. The absorbance maximum was found at 248 nm (fig.1).

The calibration curve was plotted by taking concentration (µg/ml) of the drug in x axis and absorbance in y axis.

Tablets analysis

Twenty tablets of drug were weighed and powdered. The average weight was calculated. The powder equivalent to 10 mg of ondansetron hydrochloride was weighed accurately and treated with saline (100 ml) to produce 100 µg/ml of the drug solution. The mixture was sonicated for 15 min and filtered through Whatmann filter paper No. 40. The filtrate was further diluted with distilled water to get 10 µg/ml and absorbance was measured at 248 nm. This calibration curve was used to calculate the drug from tablets.

RESULT AND DISCUSSION

The UV scan of standard solution between 200 to 400 nm showed the absorption maxima at 248 nm. The optical characteristics such as Beer's law limits, Sandell's sensitivity, molar absorptivity and the results are summarized in Table 1.

Table 1: Optical characteristics of proposed method

Parameters	Values
λ_{max} (nm)	248
Beer's law limit (µg/ml)	5-25
Sandell's sensitivity (µg/cm^2/0.001 absorbance unit)	2.560×10^{-2}
Molar absorptivity (l/mol/cm)	1.4325×10^4
LOD (µg/ml)	0.6208
LOQ (µg/ml)	1.8812
Regression equation (Y = a + bc)	
Slope (b)	0.0402
Intercept(a)	-0.0105
Correlation coefficient (r^2)	0.9983

Recovery studies were performed to judge the accuracy of the method. Recovery studies were carried out by adding a known quantity of pure drug to a pre-analyzed formulations and the proposed method was followed. From the amount of drug found, percentage recovery was calculated. The assay and recovery studies for the formulation are shown in Table 2. The excellent recovery studies prove the accuracy of the method.

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)
Ondansetron hydrochloride Tablets	4	99.97 ± 0.763	99.41 -100.43%	0.6457	0.7630

* Average of six determinations.

CONCLUSION

The proposed method was successfully applied for the determination of ondansetron hydrochloride in pharmaceutical formulations. The results demonstrated that the procedure is accurate, precise and reproducible. This method can be applied for the estimation of Ondansetron hydrochloride in its dosage forms.

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REFERENCES

1. The Merck Index - An Encyclopedia of Chemicals, Drugs and Biological 2001; 13th Edn, Merck and Company, Inc., pg. 1224.
2. Patra S, Choudhury AA, Kar RK, Barik BB. Spectrophotometric method for ondansetron hydrochloride. Indian J Pharm Sci 2007; 69(6): 840-41.
3. Raza A, Ijaz AS, Atta-ur-Rehman, Rasheed. Spectrophotometric determination of ondansetron hydrochloride in pharmaceutical bulk and dosage forms. J Chin Chem Soc 2007; 54: 223-27.
4. Patel SR, Patel LJ. Development and validation of first derivative spectroscopy method for simultaneous determination of ondansetron and metoclopramide in combined dosage form. Int J Pharm Pharm Sci 2011; 3(4): 85-88.
5. Ravi kumar P, Murali Krishna M, Bhanu prakash P, Anil kumar B and Madhusudhan P. Derivative Spectrophotometric Estimation of Ondansetron and Paracetamol. E-J Chem 2006; 3(12): 134-36.
6. Varvara A, Crina-Maria Monciu, Corina aramă, Popescu C. Ion-pair reversed-phase high performance liquid chromatography of ondansetron hydrochloride using sodium heptanesulphonate as a counterion. Farmacia. 2009; 57(4): 442-51.
7. Lin Ye and Stewart JT. HPLC Determination of an Ondansetron and Diphenhydramine Mixture in 0.9% Sodium Chloride Injection. J Liq Chrom Relat Tech 1996; 19(5): 711-18.
8. Ding P, Xu H, Wei G, Zheng J. Microdialysis sampling coupled to HPLC for transdermal delivery study of ondansetron hydrochloride in rats. Biomed Chromatogr 2000; 14(3):141-43.
9. Patel SR, Patel LJ, Thakkar YP, Patel ND. Development and Validation of analytical method for the determination of Rabeprazole and Ondansetron in pharmaceutical dosage form by Reversed-phase HPLC. Int J Chem Tech Res 2010; 2(3): 1531-36.
10. Venkateshwaran TG, Stewart JT, King DT. HPLC Determination of Morphineondansetron and Meperidine-Ondansetron Mixtures in 0.9% Sodium Chloride Injection. J Liq Chrom Relat Tech 1996; 19(8): 1329-1338.