Asian Journal of Chemistry Vol. 19, No.2 (2007), 1625-1627

NOTE

UV-Spectrophotometric Determination of Voriconazole in Bulk and Its Formulation

G. SRINU BABU and CH. A.I. RAJU*
Center of Biotechnology, Department of Chemical Engineering, Andhra University, Visakhapatnam-530 003, India
Fax: (91)(891)2747969; Tel: (91)(891)2844881/3957944
E-mail: immy_chair@yahoo.com

A simple, sensitive, spectrphotometric method in UV region has been developed for the determination of voriconazole in bulk and tablet dosage forms. Variconazole is a new antifungal drug, which shows maximum absorbance at 252 nm with apparent molar absorptivity of 5.28206×10^3 L/molcm. Beer's law was obeyed in the concentration range of 5-80 μg/mL. Results of the analysis were validated statistically and by recovery studies.

Key Words: Voroconazole, UV spectrophotometry.

Voriconazole is designated chemically as (2R,3S)-2-(2,4-difluorophenyl)-3-(5-fluoro-4-pyrimidinyl)-1-(1H-1,2,4-triazol-1-yl)-2-butanol with an empirical formula of $C_{16}H_{14}F_3N_5O$ and a molecular weight of 349.3. It is a new antifungal agent that is a derivative of fluconazle, having one triazole moiety replaced by a fluoropyrimidine ring and a methyl group added to the propanol backbone[1]. This change in structure results in potent, wide-spectrum activity *in vitro* and a fungicidal action against various mold pecies, including *Aspergillus*[2]. Few methods were reported for the determinaton of voriconazole in human serum[3-5], aqueous humar[6], its impurities determined by Ferretti *et al.*[7] and its stereoisomers were separated by Owens *et al.*[8]. No method is reported for determination of voriconazole in pharmaceutical dosage forms. This paper reports a rapid and sensitive UV method, useful for routine quality control of voriconazole in pharmaceutical dosage forms.

A double beam UV-vis spectrophotometer-Elico-SL 164 with 1 cm matched quartz cells was used. Pure voriconazole was obtained as a gift sample from M/s Sun Pharma Ltd., Ahmedabad. Voriconazole was weighed accurately and dissolved in methanol so as to give a stock solution of concentration of 1000 μg/mL. Aliquots of 100 μg/mL solution were transferred into nine 10 mL volumetric flasks and volume was adjusted with distilled water to give final concentratons of 5, 10, 20, 30, 40, 50, 60, 70

and 80 μg/mL. The absorbance was measured at 252 nm against distilled water as a blank. The proposed method was also applied to the analysis of commercially available voriconazole tablets. A quantity of mixed contents of 20 tablets equivalent to 50 mg of voriconazole was transferred into a 50 mL volumetric flask. A small quantity of methanol was added and shaken well to dissolve the drug. It was made up to volume with methanol and the solution is filtered. The filtrate was further diluted with distilled water to 20 μg/mL concentration and the absorbance measured at 261 nm against distilled water as a blank.

Recovery study: Recovery studies were carried out by adding a known quantity of pure drug to the pre-analyzed formulations and the proposed method was followed. From the amount of drug found, percentage recovery was calculated.

The proposed method of determination of voriconazole showed molar absorptivity of 5.28206×10^3 L/mol cm. Linear regression of absorbance on concentration gave the equation $y = 0.005672 + 0.0143x$ with a correlation coefficient of 0.99979. Relative standard deviation of < 1% was observed for analysis of five replicate samples, indicating precision and reproducibility. Voriconazole exhibits its maximum absorption at 252 nm and obeyed Beer's law in the concentration range of 5-80 μg/mL. The results of analysis and recovery studies are presented in Tables 1 and 2. The percentage recovery value indicates that there is no interference from the excipient(s) present in the formulation. The developed method is found to be sensitive, accurate, precise and reproducible and can be used for the routine quality control analysis of voriconazole in bulk drug and its formulations.

TABLE-1
RESULTS OF ASSAY

Trade Name	Label claim (mg)	Amount found*		C.V. (T%)
		(mg)	%	
Vfend	50.0	49.75±0.0492	98.85	0.998

*Mean of five determinations.

TABLE-2
RECOVERY STUDIES

S. No.	Label claim (mg/tablet)	Amount of standard added (mg)	Total amount recovered (mg)	% Recovery
I	50	0	48.92	99.42
II	50	10	60.64	100.6
III	50	20	69.87	99.8
IV	50	30	80.10	100.1
V	50	40	90.15	100.1

REFERENCES

1. K. Richardson, A.S. Bell, R.P. Dickinson, S. Narayanaswami and S.J. Ray, A Novel, Wide-Spectrum Triazole Derivative for the Treatment of Fungal Infections: Synthesis and SAR, Program and Abstracts of the 35th Interscience Conference on Antimicrobial Agents and Chemotherapy, Sept. 17-20; San Francisco, CA, p. 124, AF69 (1995).
2. M. Murphy, E.M. Bernard, T. Ishimaru and D. Armstrong, *Antimicrob. Agents Chemother.*, **41**, 696 (1997).
6. H. Egle, R. Trittler, A. Koeing and K. Kuemmerer, *J. Chromatogr. B.*, **814**, 361 (2005).
7. B.G. Keevil, S. Newman, S. Lockhart, S.J. Howard, C.B. Moore and D.W. Denning, *Therapeut. Drug Monit.*, **26**, 650 (2004).
8. F. Pehourcq, C. Jarry and B. Bannwarth, *Biomed. Chromatogr.*, **18**, 719 (2004).
9. L. Zhou, R.D. Glickman, N. Chen, W.E. Sponsel, J.R. Graybill and K.W. Lam, *J. Chromatogr. B*, **776**, 213 (2002).
10. R. Ferretti, B.G.F. La Torre and L. Zanitti, *Chromatographia*, **47**, 649 (1998).
11. P.K. Owens, A.F. Fell, M.W. Coleman and J.C. Berridge, *Enantiomer*, **4**, 79 (1999).

(*Received*: 24 January 2006; *Accepted*: 20 September 2006) AJC-5152