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NOTE

Development of HPLC Method for the Estimation of Valacylovir in Tablet Dosage Form

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A simple, rapid, sensitive and precise high performance liquid chromatographic method has been developed for the estimation of valacyclovir in bulk and tablet dosage form. In this method, RP-C18 column with mobile phase consisting of acetonitrile and buffer in the ratio of 85:15 (mobile phase A) and only methanol (mobile phase B) gradient mode was used. The detection wavelength is 250 nm and the flow rate is 0.6 mL/min. In the range of 0.2-8.0 mg/mL, the linearity of valacyclovir shows a correlation coefficient of 0.9999. The proposed method was validated by determining sensitivity, accuracy, precision and system suitability parameters.

Key Words: HPLC, Valacyclovir, Validation.

Valacyclovir is the L-valy ester prodrug of acyclovir[1,2]. Valacyclovir is used for the treatment of the herpes simplex viruses and the varicella zoster virus. Valacyclovir is converted rapidly and virtually completed to acyclovir after oral administration in healthy adults. The relative bioavailability of acyclovir increases three-to-five fold to *ca.* 50 % following valacyclovir administration. Very few methods for the assay of valacyclovir from the biological samples have been reported[3-5].

The separation was carried out on gradient HPLC system (Waters) with Waters 1525 Binary HPLC pump, Waters 2487 UV Dual λ Absorbance Detector, Waters Breeze software and RP-C18 column (Ymc proc-C 18, 25*4.6 mm, 3 mm). The mobile phase consisting of acetonitrile and buffer in the ratio of 85:15 (mobile phase A) and only methanol (mobile phase B) gradient mode was pumped at a flow rate of 0.6 mL/min. The detection was monitored at 250 nm and the run time was 8 min.

The standard solution of valacyclovir (1 mg/mL) was diluted suitably to get 7 different concentrations ranging from 0.2-8.0 μg/mL. The solutions were injected into the 20 μL loop and the chromatograms were recorded. The calibration graph was constructed by plotting concentration

vs. peak area . The linearity experiment was carried out in triplicate to ascertain accuracy and precision of the method.

Twenty tablets were weighed and powdered. A quantity equivalent to 100 mg of valacyclovir was weighed accurately, transferred to 100 mL volumetric flask, dissolved in methanol and made up to 100 mL with methanol. From this solution, further dilutions were made in mobile phase to get 1 μg/mL. This solution was injected and the chromatogram was recorded. The amount of valacylovir was determined from the regression equation. The results are furnished in Table-1.

TABLE-1
ASSAY AND RECOVERY STUDIES

Formulation	Label claim (mg)	Amount found* (%)	C.V. (%)	Amount of standard added (mg)	Amount recovered*	Recovery (%)
Valcivir-1	100	101.96	1.63	10	19.99	99.58
Valcivir-2	100	97.14	1.33	10	10.02	100.27
Valcivir-3	100	100.27	0.56	10	10.20	102.08

* = Mean value of five determinations.

Validation of proposed method

Validation was done according to ICH guidelines[6]. Selectivity of the method was assessed on the basis of elution of valacylovir using the above mentioned chromatographic conditions. Precision was ascertained by the determination of intra-day and inter-day variabilities. To study the accuracy, reproducibility, precision of the proposed method, recovery experiments were carried out in triplicate by adding a known amount of drug to pre-analyzed sample and the percentage recovery was calculated (Table-2).

TABLE-2
VALIDATION SUMMARY

System Suitability	Results	System Suitability	Results
Theoritical Plates (N)	4000	LOQ (μg/mL)	0.056
Resolution	7.18	Tailing factor	1.041
Linearity range (μg/mL)	0.2-8.0	Capacity factor	1.162
Percentage recovery	99.58	Symmetry factor	1.041
(Accuracy) LOD (μg/mL)	0.017		

By applying the proposed method, the retention time of valacyclovir is found to be 8 min. (Fig. 1). Linearity was obeyed in the concentration range of 0.2-8.0 μg/mL. The regression of valacyclovir concentration over peak area ratio was found to be Y = -0.0077 + 2.5972X (r =0.9999) where Y is the concentration of valacyclovir and X is the peak area ratio. The

high percentage of recovery indicating that the proposed method is highly accurate.

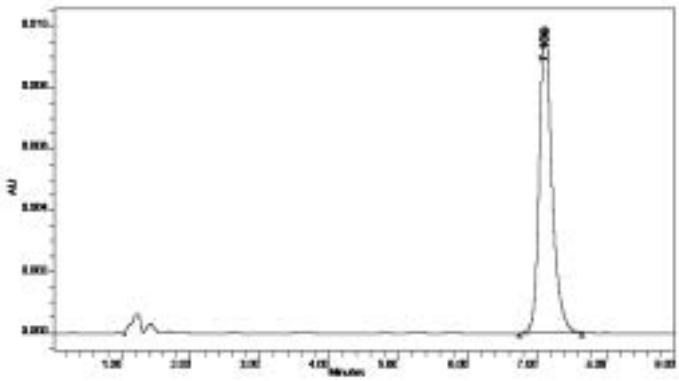

Fig. 1. Typical Chromatogram of Valacyclovir

Conclusion

The proposed HPLC method was found to be highly accurate, sensitive and precise. The present method is simple, fast and highly sensitive. This method showed excellent sensitivity (detection limit of 4.5 µg/mL) with good precision and accuracy. The response was linear over the concentration range of 0.2-8.0 µg/mL. Therefore, this method can be applied for the routine quality control analysis of valacyclovir in its tablet dosage form.

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REFERENCES

1. The United States Pharmacopoeia, The USP 24th Ed.; Easton, Rand Mc Nally: Tounton, MA (2000).
2. British Pharmacopoeia, Her Majesty's Stationary Office, London, UK (2000).
3. C.P.-Huy, F. Stathoulopoulou, P. Sandouk, J.M. Scherrmann, S. Palombo and Girre, *J. Chromatogr. B*, **732**, 47 (1999).
4. S. Weller, M.R. Blum, M. Doucette, T. Burnette, M.L. Smiley, D.M. Cederbeg and P. de Miranda, *Clin. Pharmacol. Ther.*, **54**, 595 (1995).
5. Q. He, Z. Zhang, *J.W. China Univ. Med. Sci.*, **29**, 272 (1998).
6. Proceedings of the International Conference on Harmonization (ICH), Commission of the European Communities (1996).

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