



A NEW SPECTROPHOTOMETRIC METHOD DEVELOPMENT FOR DETERMINATION OF RIMONABANT IN BULK AND TABLETS

MANAS CHAKRABORTY*, BIJAN K GUPTA¹, RABINDRA DEBNATH, RABINDRA N PAL, RANA MAZUMDER, TARSANKAR MAITY AND DIPAK K SINGHA

Department of Pharmaceutics, Calcutta Institute of Pharmaceutical Technology and Allied Heath Sciences, Uluberia.
Howrah-711316. West Bengal, India.

¹Former H.O.D, Department of Pharmaceutical Technology, Jadavpur University, Kol-32, West Bengal, India.
* E.mail:manas_borty12@yahoo.com

ABSTRACT

Rimonabant is an antiobesity drug which is CB1 cannabinoid receptor antagonist. Its main avenue of effect is reduction in appetite. So far only HPLC methods of analysis exist for the routine examination of drug. An attempt is hereby made to develop a simple spectrophotometric method for determination of drug from tablet dosage form. Rimonabant shows a maximum absorbance at 230 nm. Beer's law was obeyed in the concentration range of 10-25 µg/ml. The method was validated statistically and recovery studies carried out.

Keywords : Rimonabant, Methanol, Lambda max, Rimoslim, Accomplia.

INTRODUCTION

Rimonabant is chemically 5-(4-chlorophenyl)-1-(2,4-dichlorophenyl)4 methyl- N-(piperidin-1-yl)-1H-pyrazole-3 carboxamide. It acts by blocking the CB1 receptor^{1,2,3}, one of the two receptors found in the newly described physiological system called endocannabinoid system (EC), believed to play a critical role in the regulation of the food intake and energy expenditure. The drug is not official in any Pharmacopoeia. So far only HPLC methods⁴ for estimation of drug in bulk and plasma exist. A new U.V.spectrophotometric method has been developed for routine quality control check up of the drug Rimonabant in tablet. The method is simple, reproducible and statistically valid.

MATERIALS AND METHODS

Materials

Rimonabant was obtained as a gift sample from Hetero Labs Ltd, Hyderabad. Methanol and other reagents were of analytical grade.

UV-VIS spectrophotometer (Shimadzu 1700) with a fixed slit width (2 nm) and 10

millimeter quartz cell was used to obtain spectrum and absorbance measurement.

Methods

Rimonabant 5 mg was accurately weighed and diluted to 25 ml with methanol. From this, 5ml was taken and diluted to 50 ml with methanol to give a stock of 20 µg concentration of drug per ml. From this, 0.5 ml, 0.75ml, 1ml and 1.25ml transferred to four test tubes to give a drug concentration of 10µg, 15µg, 20µg and 25µg of drug/ml. The solution was scanned in spectrophotometer (Shimadzu-1700) against methanol as blank. In order to assess the drug recovery^{5,6} 10 tablets each from two market products (a) Rimoslim 20 mg, (Torrent labs) and (b) Accomplia 20 mg, (Sanofi Aventis) were weighed and powdered. From this, powder equivalent to 10 µg drug was weighed, diluted to 25 ml with methanol. The solution was shaken well and filtered through Whatman filter paper (No.41). The filter paper was washed with the blank. The washing was added to the filtrate and final volume made up to 100 ml with the blank. After suitable dilution, absorbance of final

sample corresponding to 10 µg/ml was recorded against blank^{7,8}.

To examine the absence of either positive or negative interference of excipients used in formulation, recovery studies were carried out at five different levels^{9,10} by adding diluted pure drug solution equivalent to 0,10,15,20 and 25 µg to five samples of tablet powdered

solution. The determination was carried out for five replicates at each interval.

RESULTS AND DISCUSSION

Maximum absorption for pure Rimonabant in UV spectrophotometer was recorded at 230 nm. The method was validated according to ICH guide line⁷. The optical characters such as Beer's law limit, molar absorptivity and other parameters are summarized in Table No.-1.

Table 1: Rimonabant bulk and test parameters comparative study

PARAMETERS	VALUE	
	STANDARD	TEST
Absorption maximum	230 nm	230 nm
Beer's law limit (µs/ml)	10-25mcg/ml	10-25mcg/ml
Correlation coefficient (r)	0.9957	0.9902
r squared	0.9915	0.9806
Molar absorptivity (1. mol ⁻¹ cm ⁻¹)	267601.06	---
Regression equation (y=mx+c)	Y=0.05002x-1.377	Y=0.04744x-1.819
Slope (m)	0.05002	0.04744
Intercept (c)	-1.377	-1.819
Standard deviation	0.03667	0.05281
P value	0.0043	0.0098
Linear regression	0.3128	0.2813
Deviation from linearity	0.002689	0.002789
Percentage Recovery ± S.D	-----	94.28-98.0 ±0.053%

Linear regression of standard with correlation coefficient r= 0.9957 indicates a good linearity between absorbance and concentration range of 10-25 mcg/ml. The value of percentage relative standard deviation less than 1% and low percentage of error confirm high degree of precision and accuracy of proposed method. The assay result obtained by proposed method was found to vary from 94.28% to 98% ±0.053% which is good agreement with labeled amount. It also indicates reproducibility of

the results and absence of interference of excipients¹¹ present in formulation. On comparison of parameter as per ICH guideline both standard and test were found to be comparable to each other (Table 1).

CONCLUSION

It can be concluded that proposed method for estimation of Rimonabant is simple, convenient, accurate, sensitive and reproducible. It can be successfully used for routine analysis of the drug in bulk and tablet as alternative to existing HPLC method.

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