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A NEW RP HPLC METHOD DEVELOPMENT AND VALIDATION FOR THE SIMULTANEOUS ESTIMATION OF NETUPITANT & PALONOSETRON IN BULK AND PHARMACEUTICAL DOSAGE FORMS

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ABSTRACT

A simple and selective LC method is described for the determination of Netupitant and Palonosetron in tablet dosage forms. Chromatographic separation was achieved on a C_{18} column using mobile phase consisting of a 55 volumes of mixed phosphate buffer and 45 volumes of acetonitrile were prepared. with detection of 253nm. Linearity was observed in the range 25-125 µg/ml for Netupitant(r^2 =0.995) and 50-150 µg /ml for Palonosetron(r^2 =0.999) for the amount of drugs estimated by the proposed methods was in good agreement with the label claim. The proposed methods were validated. The accuracy of the methods was assessed by recovery studies at three different levels. Recovery experiments indicated the absence of interference from commonly encountered pharmaceutical additives. The method was found to be precise as indicated by the repeatability analysis, showing %RSD less than 2. All statistical data proves validity of the methods and can be used for routine analysis of pharmaceutical dosage form.

Key Words: Netupitant, Palonosetron, LC method

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INTRODUCTION

Chromatography equipment look rather intimidating to anyone who has not handled them before, but on a closer look and as you get familiar with the equipment you realize that behind the network of wires, complex plumbing and circuitry is a simple machine with only a few major parts. Different combinations of these parts namely pumps, detectors and injectors yield an infinite number of configurations based on the application.Just like an understanding of human anatomy makes you conscious of the vital role of system. You will ensure long time usage with high reliance on output data. The present module is intended to serve this very purpose and in simple terms you will appreciate the role of each part and its contribution to overall system efficiency.HPLC is a technique for separation, identification and quantification of components in a mixture. It is especially suitable for compounds which are not easily volatalised, thermally unstable and have high molecular weights.The liquid phase is pumped at a constant rate to the column packed with the stationary phase. Before entering the column the analysis sample is injected into the carrier stream. On reaching the column the sample components are selectively retained on the basis of physico-chemical interactions between the analyte molecules and the stationary phase. The mobile phase moving at a steady rate elutes the components based on the

operating conditions. Detection techniques are employed for detection and quantification of the eluted components.We now introduce you to the significance and role of each component part of the HPLC system (1-4).Aim is to develop new RP HPLC method for the simultaneous estimation of Netupitant and Palonosetronpharmaceutical dosage form.

MATERIALS AND METHODS

Determination Of Working Wavelength (λmax)

In simultaneous estimation of two drugs isobestic wavelength is used. Isobestic point is the wavelength where the molar absorptivity is the same for two substances that are interconvertible. So this wavelength is used in simultaneous estimation to estimate both drugs accurately.

Preparation of standard stock solution of NETUPITANT

10 mg of NETUPITANTwas weighed and transferred in to 100ml volumetric flask and dissolved in methanol and then make up to the mark with methanol and prepare 10 µg /ml of solution by diluting 1ml to 10ml with methanol.

Preparation of standard stock solution of PALONOSETRON

10mg of PALONOSETRON was weighed in to 100ml volumetric flask and dissolved in Methanol and then dilute up to the mark with methanol and prepare 10 µg /ml of solution by diluting 1ml to 10ml with methanol.

Assay

10 tablets (each tablet containsAkynzeo (Netupitant and palonosetron – 300 mg and 0.5 mg)) were weighed and taken into a mortar and crushed to fine powder and uniformly mixed. Tablet stock solutions of were prepared by dissolving weight equivalent to 10 mg of NETUPITANT and PALONOSETRON and dissolved in sufficient mobile phase. After that filtered the solution using 0.45-micron syringe filter and Sonicated for 5 min and dilute to 10ml with mobile phase. Further dilutions are prepared in 5 replicates of 100µg/ml of NETUPITANT and 50µg/ml of PALONOSETRON was made by adding 1.5 ml of stock solution to 10 ml of mobile phase (5-7).

RESULTS AND DISCUSSION

The wavelength of maximum absorption (λ_{max}) of the drug, 10 µg/ml solution of the drugs in methanol were scanned using UV-Visible spectrophotometer within the wavelength region of 200–400 nm against methanol as blank. The resulting spectra are shown in the Fig-1. The isobestic point was found to be 253 nm for the combination.

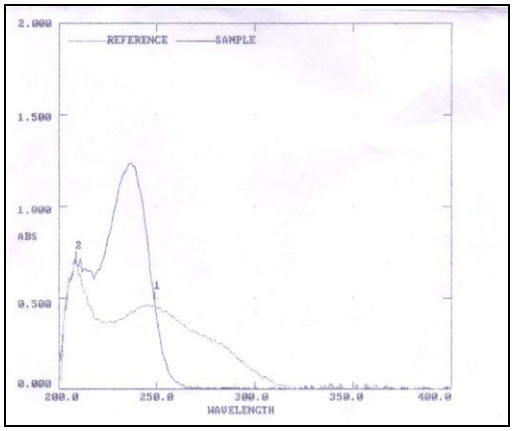

Fig-1 UV-VIS spectrum of Palonosetronand Netupitantthe isosbestic point was 253 nm

The amount of NETUPITANT and PALONOSETRON present in the taken dosage form was found to be 100.04% and100.36% respectively (Table-1).

Table-1 Assay Results

	NETUPITANT		PALONOSETRON	
	Standard Area	**Sample Area**	**Standard Area**	**Sample Area**
Injection-1	558996	556320	640249	648536
Injection-2	560893	559691	647102	645717
Injection-3	560837	563445	642088	648013
Injection-4	557645	559365	648819	647341
Injection-5	556714	557488	642237	642566
Average Area	559017	559261.8	644099	646434.6
Standard deviation	1872.058		3661.628	
%RSD	0.33		0.56	
Assay(%purity)	100.04		100.36	

The correlation coefficient for linear curve obtained between concentration vs. Area for standard preparations of NETUPITANT and PALONOSETRON is 0.995 and 0.999. The relationship between the concentration and area of NETUPITANT and PALONOSETRON is linear in the range examined since all points lie in a straight line and the correlation coefficient is well within limits (Fig-2 and Fig-3). The percentage mean recovery of NETUPITANT and PALONOSETRON is 101.93% and 100.5% respectively. From the observation it was found that the system suitability parameters were within limit at all variable conditions.

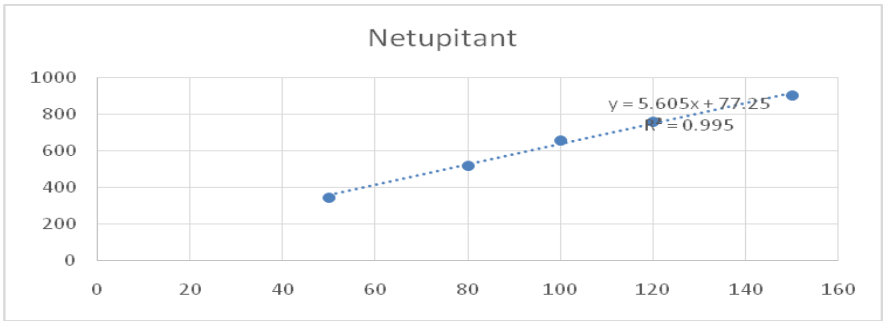

Fig-2 Linearity graph of NETUPITANT

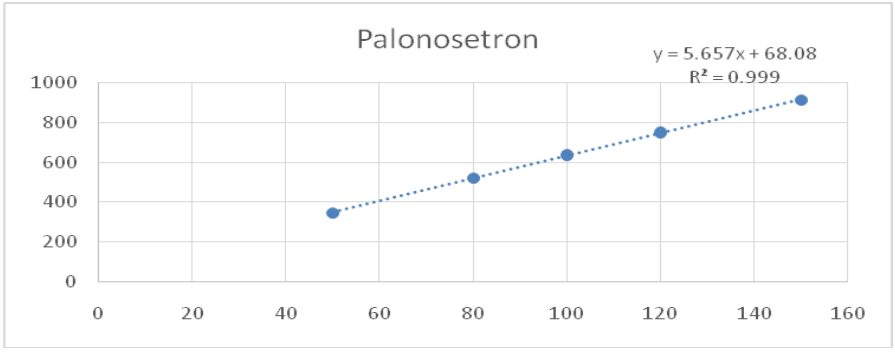

Fig-3 Linearity graph of PALONOSETRON

From the observation the between two analysts Assay values not greater than 2.0%, hence the method was rugged (Table-2).

Table-2 Results for Ruggedness

NETUPITANT	**%Assay**	PALONOSETRON	**%Assay**
Analyst 01	100.01%	**Analyst 01**	99.37%
Anaylst 02	100.82%	**Anaylst 02**	99.58%
% RSD	0.27	**% RSD**	1.13

CONCLUSION

From the above experimental results and parameters it was concluded that, this newly developed method for the simultaneous estimation Netupitant and Palonosetron was found to be simple, precise, accurate and high resolution and shorter retention time makes this method more acceptable and cost effective and it can be effectively applied for routine analysis in research institutions, quality control department in meant in industries, approved testing laboratories studies in near future.

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