

ASSAY OF MOXIFLOXACIN BRANDS

SAFILA NAVEED^{1*}, SHEEBA UROOG¹ AND NIMRA WAHEED¹

¹Faculty of Pharmacy Jinnah University for women Karachi

ABSTRACT

Moxifloxacin is a fourth generation fluoroquinolones synthetic antibacterial agent. Moxifloxacin active against gram positive and gram negative bacteria. Many oral and parenteral preparation of moxifloxacin are used to treat the many respiratory and skin infections. In this study, a quick and simple assay method has been developed by using the UV spectrophotometer. The assay of different brands of moxifloxacin is based on measuring the absorbance at the 294 nm wave length .Moxiget , avolox and izilone three different brands of moxifloxacin are taken from the market . 200ppm, 100ppm, 50ppm and 25ppm solutions were prepared. The percent assay is calculated and the correlation coefficient for different brands was found to be 0.998 for A, 0.997 for B, 0.999 for C which are within the limit. Thus we can conclude that the method can be applied for the routine QC quantitative analysis of moxifloxacin tablet formulation.

Key words: Moxifloxacin, Assay, Spectrophotometer.

INTRODUCTION

Moxifloxacin is a synthetic fourth generation fluoroquinolones antibacterial agent. moxifloxacin chemical name (1-cyclopropyl -6-fluoro-1,4-dihydro -8- methoxy -7-[(4a,7a)-octahydro-6H-pyrrolo[3,4-b]pyridine-6-yl]-4-oxo-3 quinoline carboxylic acid. Moxifloxacin give action by inhibition of an enzyme topoisomerase 2 (DNA gyrase) essential for replication of DNA [1]. Moxifloxacin active against broad spectrum pathogens, include gram (+ve) and gram (- ve) bacteria [2, 5]. Moxifloxacin is available in oral and parenteral preparation which is used to treat skin and respiratory infections. for quantitative determination of therapeutically important drug several development of analytical method has promoted . For the determination of moxifloxacin high performance liquid chromatographic method adopt by British pharmacopeia [3]. another analytical method include capillary electrophoresis , microbiological assay , HPTLC, HPLC .LC-MS/MS, differential plus polarography and electrochemical method .MS method / chromatographic method is difficult to perform and tedious or selective and expensive detectors are required in many laboratories that might not be accessible because of spectrophotometric inherent simplicity and availability , it is consider as more convenient alteration technique . For determination of moxifloxacin on its pharmaceutical dosage form a number of UV spectrophotometric method has been reported.

MATERIAL AND METHOD

For the measurement of spectra UV visible Shimadzu double beam spectrophotometer was used. Water used as a solvent for assay.

SELECTION OF WAVE LENGTH:

Accurately prepare 200ppm of moxifloxacin solution in water individually of all of 3 brands and at 294nm wavelength these solution were scanned.

STANDARD STOCK SOLUTION:

Accurately weigh 20mg of moxifloxacin standard was carefully transferred to volumetric flask. Dissolve it water and make up the volume up to 100ml with water.

SAMPLE PREPARATION:

From different public medical store located in Karachi Pakistan three brands of moxifloxacin were purchased. Each brands labeled to contain 400mg of moxifloxacin per tablet and all tablets of each brand have same batch number. moxiget have 03 year shelf life, avelox have 04 year shelf life and izilone have 03 year shelf life. For identification of purchased brands serial number are given in table. Accurately weigh 20 tablets of each brands of moxifloxacin and uniformly crushed by the help of mortar and pestle. In the volumetric flask average weight of each brand sample powder equivalent to 20mg of moxifloxacin was transferred. Dissolve this 20mg sample powder with water and make up the volume upto with 100ml with the help of water.

DILUTIONS PREPARATION

The dilutions of different brands of moxifloxacin i.e. moxiget, avelox and izilone were prepared from sample solution of each brand. Four different dilutions of 200ppm, 100ppm, 50ppm, 25ppm of each brand were prepared from 200ppm sample solution.

PROCEDURE

After preparation of standard solution, sample solutions and their dilutions, measure the absorbance of standard solution (200ppm in 100 ml) and different dilutions (100ppm, 50ppm, 25ppm all in 100 ml) by using UV-VIS spectrophotometer of 1cm cuvette at the wavelength of maximum absorbance 294 nm against blank solution. Calculate the quantity in mg, of moxifloxacin per tablet.

RESULT

The aim of the study was to carry out the pharmaceutical assay on different brands of ciprofloxacin tablets (moxiget, avelox and izilone) by using spectrophotometer. Pharmaceutical company name, Brand names, average wt of tablets, weight for 200ppm in 100 ml, absorbance at 294nm and % assay are shown in table 1, 2 and figure 1. Four dilutions of 200ppm, 100ppm, 50ppm and 25ppm for each brand of moxifloxacin were prepared. Their absorbance was taken to calculate the percentage assay, regression equation, to obtain the regression line and to predict further availability of moxifloxacin. The linearity was detected by preparing solution of 200ppm, 100ppm, 50ppm, and 25ppm of each brand and absorbance were taken in triplicate manner at each level by spectrophotometric analysis. Concentration vs. absorbance at level of 200ppm, 100ppm, 50ppm and 25ppm were plotted on graph for linearity detection shown in figure 2, 3 and 4. It concludes that concentration and absorbance obeys Beer's Lambert law i.e. absorbance is directly proportion to concentration. The squared correlation coefficient (should be ≥ 0.99) for different brands shown in table 4,

it was found to be 0.998 for moxiget (A), 0.997 for izilone (B) ,0.999 for avelox (C) which concludes that the value of all brands of moxifloxacin are within the limit. We had perform these types of assay which were useful for pharmacist and health professionals[6-15].

Table 1: Different brands of moxifloxacin

Brand Name	Average wt of tablet g	Absorbance at 294nm	% assay
Moxiget (A)	618.1mg	1.957	103.91
Izilon (B)	662.4mg	1.958	104.21
Avelox (C)	694.8mg	1.639	100.19

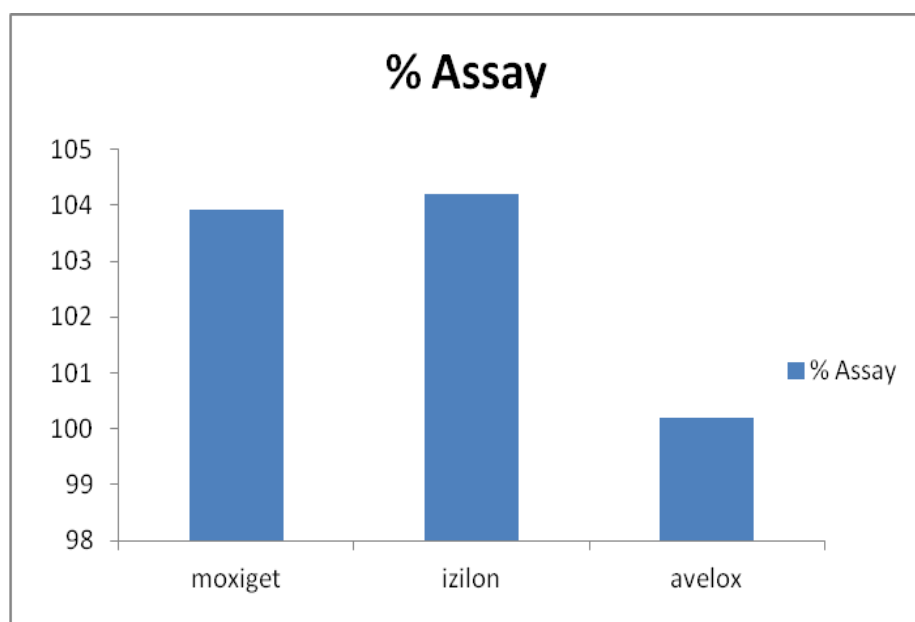


Figure 1: % Assay of different brands of moxifloxacin

Table 3: Absorbance of different brands

CONCENTRATIONS	ABSORBANCE		
	A	B	C
25	0.551	0.195	0.513
50	0.764	0.532	0.721
100	1.198	0.978	1.161
200	1.959	1.962	1.989

Table 4: Regression equations of different brands

Brands	Regression equations	R ²
A	$y = 0.008x + 0.365$	0.998
B	$y = 0.009x - 0.011$	0.997
C	$y = 0.008x + 0.304$	0.999

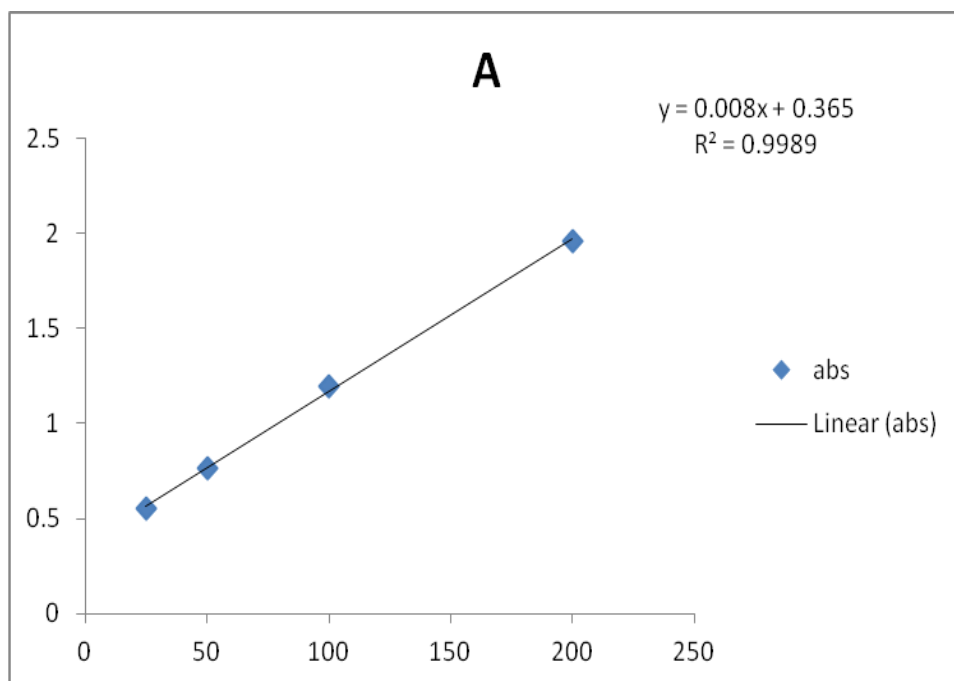


Figure 2: linearity plot for assay of different dilutions of Moxiget

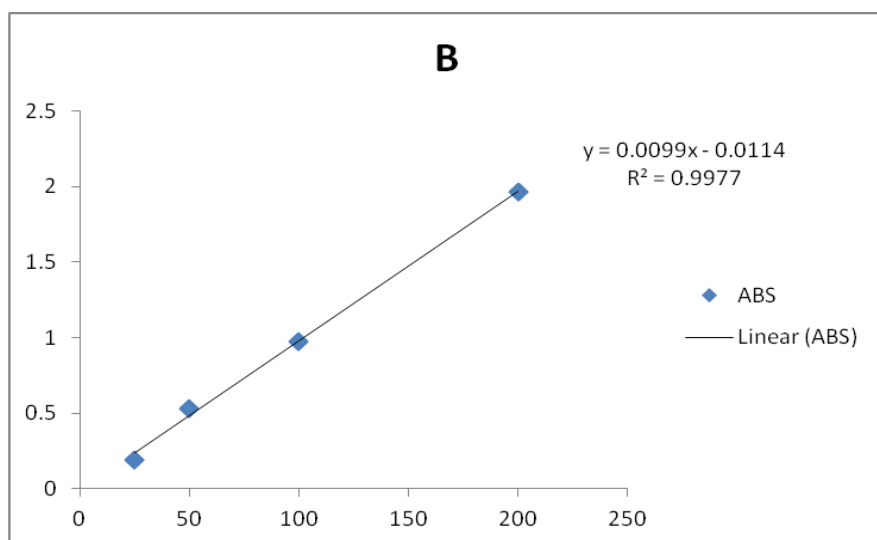


Figure 1: linearity plot for assay of different dilutions of Izilon

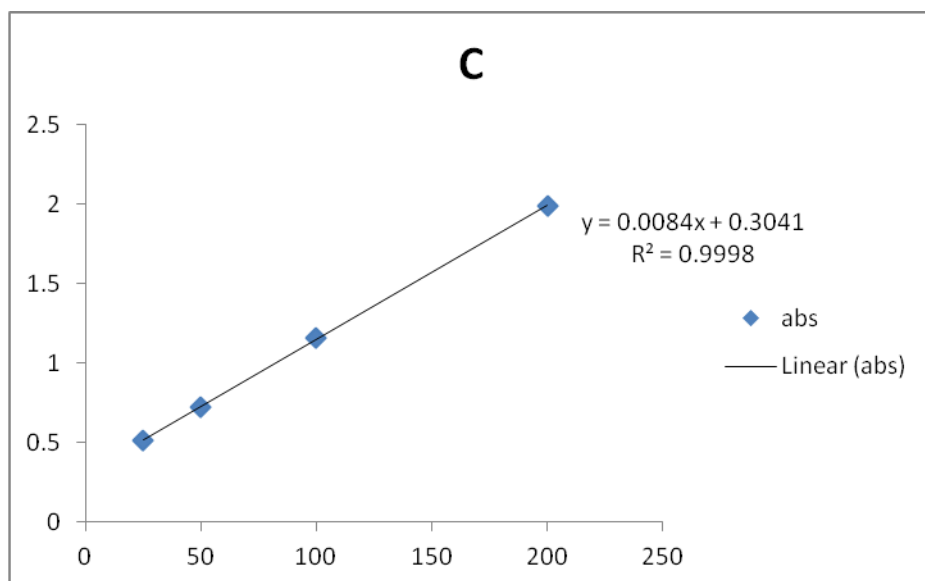


Figure 4: linearity plot for assay of different dilutions of Avelox

CONCLUSION

A good linear relationship was observed in the concentration ranges of 100ppm, 50ppm and 25ppm for different brands of moxifloxacin tablets i.e. MOXIGET, AVELOX AND IZILONE. The correlation coefficient for different brands of moxifloxacin was found to be 0.998 for moxiget (A), 0.997 for izilone (B), 0.999 for avelox (C) which are within the limit.

REFERENCES

1. Keating GM, Scott LJ. Moxifloxacin, 2004A review of its use in the management of bacteria infections. *Drugs*,; 64: 2347-237.
2. Appelbaum PC, Hunter PA. 2000. The fluoroquinolone antibacterials: past, present and future perspectives. *Int. J. Antimicrobial Agents*,; 16: 5-15. *British Pharmacopoeia*, 2008. Vol. II, London,; p.1491
3. Akachukwui, Nwodo N.J, Mbah C.J, 2013 SPECTROPHOTOMETRIC DETERMINATION OF MOXIFLOXACIN IN PHARMACEUTICAL BULK AND DOSAGE FORMS, *world journal of pharmaceutical sciences*, ISSN 2277-7105 vol3(1)
4. Arun .K.S.Mangamma.k, Anusha.M, Janiki.P.V, Raja.k.v. 2010 Nov – Dec .A validated RP – HPLC method for the analysis of moxifloxacin Hcl in pharmaceutical dosage form, *an international journal of advances in pharmaceutical sciences*, Issn. 0976-3090.vol.1(2).
5. Huma Dilshad, Safila Naveed and Baqir Naqvi (2013) Assay of new formulations of isosorbide mononitrate by using uv spectrophotometer : BPJ0000115 - *World Research Journal of Medicine* Volume : 1 Issue : 1, pg9-10
6. Huma Dilshad, Safila Naveed and Ghulam Sarwar (2014) Simple spectrophotometric assay of available brands of Acetaminophen tablets and their comparative study *Journal of pharmacy and pharmaceutical sciences* Volume 2, Issue 1,1-4
7. Safila Naveed, Fatima Qamar, Ghulam Sarwer., (2014) Percentage assay of metformin in different medium using UV- spectrophotometer BPJ0000130 - *World Research Journal of Organic Chemistry* Volume : 2 Issue :

- 1, 12-14 ISSN: 2320-3374 & E-ISSN: 2320-5679,
<http://www.bioinfopublication.org/jouarchive.php?opt=&jouid=BPJ0000130>
8. Safila Naveed (2014) Simple UV spectrophotometric assay of Atorvastatin API formulation and their comparative study, Global Journal of Medical Research .14(2):35-38.
https://globaljournals.org/GJMR_Volume14/4-Simple-UV-Spectrophotometric-Assay.pdf
 9. Safila Naveed and Fatima Qamar (2014) A simple assay of Esomeprazole Using UV spectrophotometer The Global Journal of Pharmaceutical Research (TGJPR) 3(2); 1921-25,<http://www.tgjpr.com/view-article.php?id=3433>
 10. Safila Naveed and Fatima Qamar (2014) Simple UV spectrophotometric assay of Mefenamic acid International Journal of Pharma Sciences and Research (IJPSR) ,5(7):364-366 .<http://www.ijpsr.info/ijpsr-v5n7.php>
 11. Safila Naveed, Shabana Naz Shah, Fatima Qamar , Nimra Waheed, and Safeena Nazeer, (2014) simple uv spectrophotometric assay of new formulation gentamycin J App Pharm Vol. 6; Issue 4: 407-410
 12. Safila Naveed, Shabana Naz Shah, Fatima Qamar , Nimra Waheed, and Safeena Nazeer, (2014) Simple UV spectrophotometric assay of Lincomycin, IJPRDD, 1 (2),10-12.
 13. Safila Naveed* and Amber Nawab (2014) Assay of LVFX (levofloxacin) in different formulation by UV spectroscopy IJPRDD, 1 (2), 13-16.
 14. Safila Naveed and Fatima Qamar (2014) Simple UV spectrophotometric assay of Metronidazole Open Access Library Journal, 1