

Simple UV spectrophotometric assay of Glimepride

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To Cite This Article

Safila Naveed, Hina Qamar, Wardha Jawaid, Urooj Bokhari. Simple UV Spectrophotometric Assay of Glimepride. *Open Science Journal of Clinical Medicine*. Vol. 2, No. 4, 2014, pp. 94-97.

Abstract

Glimepride belongs to sulfonylurea oral anti diabetic. A efficient least time consuming and simple spectrophotometric method for the assay of Glimepride has been used. The assay is based on the ultraviolet UV absorbance maxima at about 200nm wavelength of Glimepride using water as solvent. A sample of drug was dissolved in water to produce a solution containing Glimepride. Similarly, various dilutions were made. The absorbance of sample preparation was measured at 200nm against the solvent blank and the assay was determined. In our study a simple and quick assay method using U.V spectrophotometer has been used. The assay is based on measuring the absorbance of formulation of Glimepride dilutions at the wavelength of 200 nm. Four different dilutions of 50ppm, 25ppm, 12.5ppm and 6.25ppm is prepared and their percent assay is calculated.

Keywords

Glimepride, Assay, UV Spectrophotometry

1. Introduction

Glimepride is an oral anti diabetic belongs to the class of sulfonylurea. It is chemically describe as 1-[[p-[2-(3-ethyl-4-methyl-2-oxo-3-pyrroline-1carboxamido)ethyl]phenyl]sulfonyl]-3-(trans-4-methylcyclohexyl) urea (C₂₄H₃₄N₄O₅S) with a molecular weight of 490.62.[1, 2]. Glimepride is a white to yellowish-white, odorless, crystalline powder and is practically insoluble in water. Glimepride acts as an insulin secretagogue.[3]. It lowers blood sugar by stimulating the release of insulin by pancreatic beta cells and by inducing increased activity of intracellular insulin receptors.

Literature survey reveals that several methods have been developed for the quantitative determination of glimepride in plasma and urine. These include HPLC [3][5][6] and LC [4], UV spectrophotometry [7] and HPTLC [8].

The aim of our present study was to calculate the percent assay different brands of Glimepride. Efficient spectrophotometric method for the assay of Glimepride has been used. This method was sufficiently good accurate, precision, and permitted a simple and cost effective assay

of the compound in its dosage form.

2. Experimental

UV visible 1601 Shimadzu double beam spectrophotometer was used to measurement of spectra. The solvent which are used for the assay was water.

2.1. Wavelength Selection

About 40 ppm of C solution was accurately prepared in water. This solutions were scanned in the 200-400 nm UV region. The wavelength maxima (max) was observed at 200 nm and this wavelength was adopted for absorbance measurement.

2.2. Standard Stock Solution of Different Brands

The five different brands of Megapride (Mega pharmaceutical), Glory (Sandoz pharma), Glyset (Wilshive pvt laboratory), Diabold (Barrett hodgson Pvt Ltd), Amaryl (Sanofi Aventis), Glioptim (Merck private limited) was

purchased from different pharmacies in Karachi, Pakistan. All tablets of each brand have same batch number. All the five brands have 5 year shelf life. Each brand equivalent to 4mg of Glimepiride was transferred in a volumetric flask containing small water then solution was sonicated for about 5 min and than make up volume upto 100 ml with water. Same procedure was repeat for all brands for preparation of solutions.

2.3. Dilutions Preparation

Four dilutions of 50ppm, 25ppm, 12.5ppm and 6.25ppm were made from 100ppm sample of Glimepiride solution.

3. Procedure

After preparation of stock solutions, strength of solution 100 ppm in 100 ml absorbance of the sample preparation and transfer 25ml, 12.5ml, 6.25ml and 3.125ml in volumetric flask and make up the volume up to 50ml to make dilution and then transfer it in 1cm cell at the wavelength of maximum absorbance at about 200nm, using a spectrophotometer, using the blank solution.

4. Result and Discussion

Pharmaceutical assay was carried out by using spectrophotometer on different brands of Glimepiride available in Pakistan. Four different dilutions of each brand were prepared (100ppm, 50ppm, 25ppm, 12.5ppm and 6.25ppm). Their percent assay is calculated and regression equation and regression line is obtained . For detect linearity solutions of 100ppm, 50ppm, 25ppm, 12.5ppm and 6.25ppm is prepared and three absorbances in triplicate were taken at each level in spectrophotometric analysis. For linearity plot concentration vs. absorbance at level 100ppm, 50ppm, 25ppm, 12.5ppm and 6.25ppm of each brand is shown in fig 1, fig 2, fig 3, fig 4, fig 5 and fig 6. Squared correlation coefficient of each brand is shown in table no 1. It should not be less than 0.99. Squared correlation coefficient value of all the brands of Glimepiride are well within the limit. All six brands of Glimipride showed linear relation with their dilution as shown in table no 2.

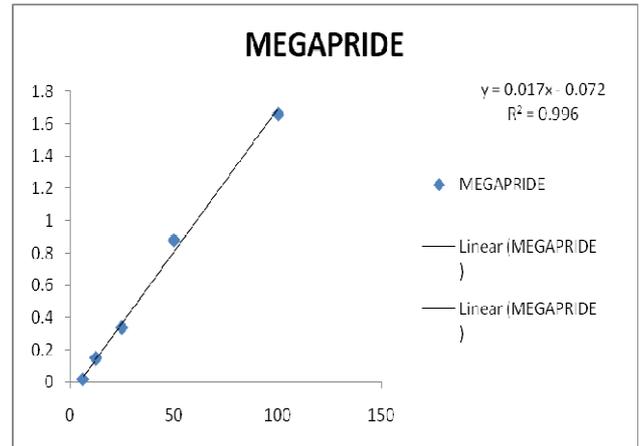


Fig. 2. Linearity plot for assay of different dilutions of Megapride

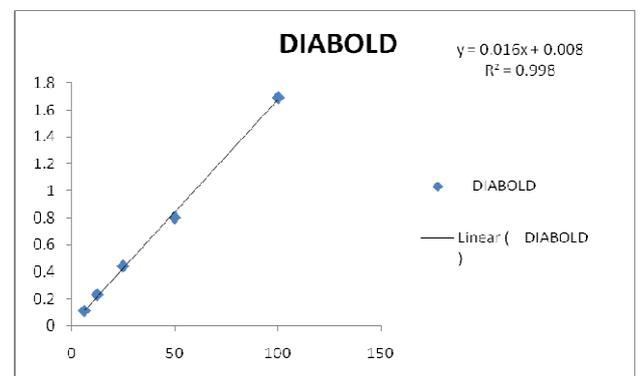


Fig. 3. Linearity plot for assay of different dilutions of Diabold

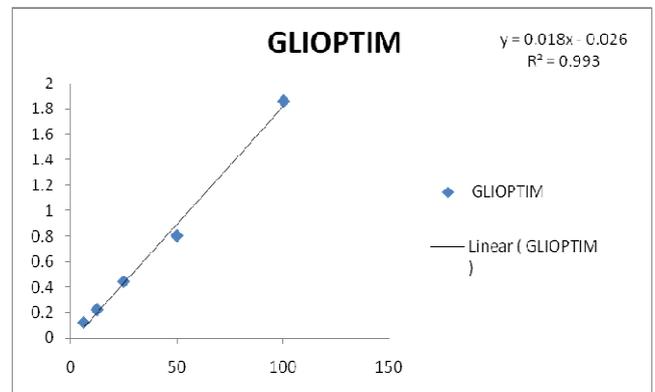


Fig. 4. Linearity plot for assay of different dilutions of Glioptim

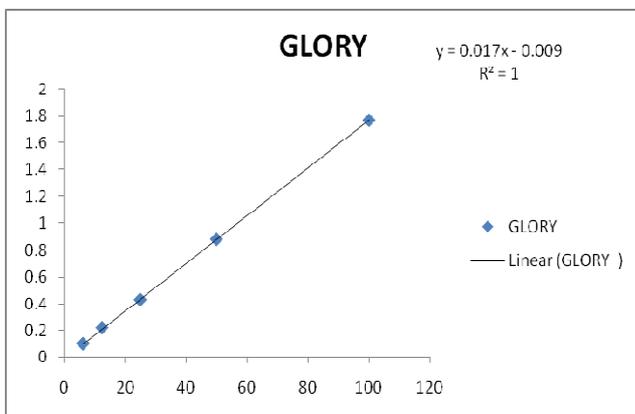


Fig. 1. Linearity plot for assay of different dilutions of Glory

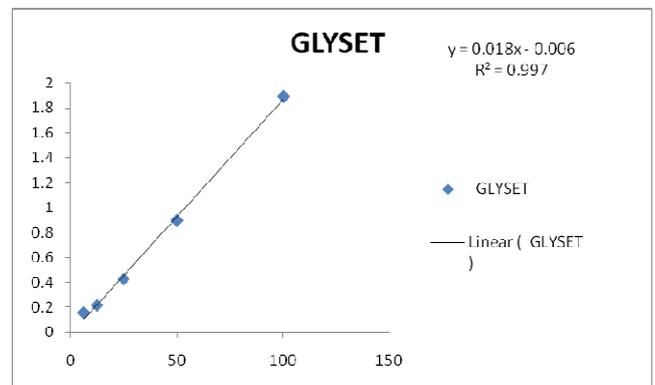


Fig. 5. Linearity plot for assay of different dilutions of Glyset

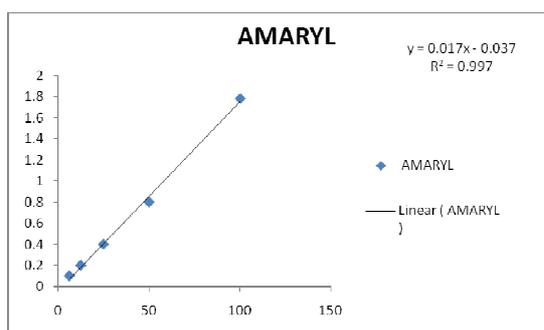


Fig. 6. Linearity plot for assay of different dilutions of Amaryl

Table 1. Regression equation and Correlation Coefficient of different brand of Glimepride

BRANDS	STRENGTH	REGRESSION EQUATION	CORRELATION COEFFICIENT
Glory	4mg	$y=0.017x-0.009$	$R^2=1$
Megapride	4mg	$y=0.017x-0.072$	$R^2=0.996$
Diabold	4mg	$y=0.017x-0.008$	$R^2=0.998$
Glioptim	4mg	$y=0.017x-0.026$	$R^2=0.993$
Glyset	4mg	$y=0.017x-0.006$	$R^2=0.997$
Amaryl	4mg	$y=0.017x-0.037$	$R^2=0.997$

Table 2. Absorbance Of Different Brands With Different Dilutions

BRANDS	AVERAGE WT OF TABLET IN 10mg	ABSORBANCE IN DIFFERENT CONCENTRATION				
		100ppm	50ppm	25ppm	12.5ppm	6.25ppm
Glory	460mg	1.77	0.88	0.43	0.22	0.1
Megapride	325mg	1.66	0.88	0.34	0.15	0.02
Diabold	425mg	1.69	0.8	0.44	0.23	0.11
Glioptim	845mg	1.86	0.8	0.44	0.22	0.12
Glyset	500mg	1.89	0.9	0.43	0.22	0.16
Amaryl	425mg	1.78	0.8	0.4	0.2	0.1

5. Conclusion

The uv spectrophotometric method proposed for the determination of glimepride in tablets formulation A good linear relationship was observed for different concentrations ranges of 100ppm, 50ppm, 25ppm, 12.5ppm and 6.25ppm. Squared correlation coefficient value is well within the limit and the %assay lies within in the standard BP and USP limits i.e 95-105%.

Our research group has done these types of assay for different commonly used generic for examples, acetaminophen, metformin from different medium, atorvastatin in active pharmaceutical ingredients (API) and formulation, esomeprazole, mefenamic acid, new formulation gentamycin, lincomycin, LVFX, metronidazole isosorbide mononitrate (ISMN) and their brands. These studies are very helpful for drug prescribers, doctors and pharmacist to choose best drug [9-18].

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