A rapid, simple, accurate, and economical least time consuming spectrophotometric method has been developed for the assay of ceterizine and then compare assay of brand available in Pakistan. The assay is based on the ultraviolet UV absorbance maxima at about 229 nm wavelength of ceterizine using methanol as solvent. A sample of drug was dissolved in methanol to produce a solution containing ceterizine. Similarly, a sample of ground tablets of different brand were extracted with methanol and diluted with the same methanol. The absorbance of sample preparation was measured at 229 nm against the solvent blank and the assay was determined by comparing with the absorbance of available brand. The method can be applied for the routine QC quantitation of ceterizine in tablet formulation and active.

**Keywords**— ceterizine, assay, UV pectrophotometry

**Introduction:**

Cetirizine is the fourth addition to a new generation of allergy medication called “non sedating” antihistamine. These new antihistamines are classified as non-sedating agents because they cause less sedation than their predecessors. Cetirizine displays a series of advantages over its predecessors as it is free of both sedative and cholinergic effects and has potent antiallergic activity. However, it is more sedating than the other non-sedating antihistamine. Cetirizine was among those drugs which were widely prescribed in Europe for allergy before it was introduced in America.

Cetirizine dihydrochloride (fig 1) (RS)-2-[2-[(4-chlorophenyl)phenyl methyl]piperazin-1-yl]ethoxy]acetic acid dihydrochloride, dried substance is primarily acid metabolite of hydroxyzine resulting from complete oxidation of primary alcohol moiety. It is available as a crystalline powder that is soluble in water and insoluble in acetone and in methylene chloride.
There are different methods have been reported for determination of cetirizine in drug, blood and serum by using colorimeter and fluorimetric. Some UV methods also reported for determination of cetirizine; these methods were based on chloroform complexed formation between cetirizine with bromocresol purple (BCP) or bromophenol blue (BPB). The system obeyed Beers Law for BCP & BPB. In another method roxatidine was employed as the internal standard for quantification of cetirizine and the internal standard (IS).

But there is no simple method reported like this using single methanol. Our research group has done this type of assay for different drugs.

**EXPERIMENTAL**

Ultra Violet visible 1601 Shimadzu double beam spectrophotometer was used for the analysis of spectra. The solvent used for the assay was simple analytical grade methanol.

**Wavelength Selection**

About 100 ppm of cetirizine solution was accurately prepared in methanol. This active standard solutions was scanned in the UV region 200-400 nm. The wavelength maxima (\( \lambda_{\text{max}} \)) was observed at 229 nm and this wavelength was used for absorbance measurement.

**Standard Stock solution**

Accurately weighed 10 mg of cetirizine standard was transferred to a volumetric flask and add sufficient water to produce 100 ml this is 100 ppm in 100 ml.

**Sample Preparation**

The four different brands of ceterizine Zyrtec, zanlan, ronex and sedil belong to pharma AGP, Novartis, Hilton and Sami pharmaceuticals were purchased from different medical store of Karachi, Pakistan. Each brands of ceterizine tablets have same batch number and were labeled to contain ceterizine 10 mg per tablet. All the four brands have 5 year shelf life.

20 tablets of four different brands (Zyrtec, zanlan, ronex and sedil) from the marketed sample were weighed and crushed uniformly with the help of a mortar and pestle. By calculating the average weighed sample powder equivalent to 10 mg of ceterizine was transferred into a volumetric flask containing 10 mL water. The solutions were sonicated for about 5 min and then make up volume upto 100 ml with water.

**PROCEDURE**

After preparation of standard and tablet solutions, strength of solution 100 ppm in 100 ml absorbance of the sample preparation and standard preparation in 1 cm cell at the wavelength of maximum
absorbance at about 229nm, using a spectrophotometer, using the blank solution. Calculate the quantity in mg, of ceterizine per tablet.

RESULTS AND DISCUSSION:
Pharmaceutical assay of ceterizine was carried out by using UV spectrophotometer. Table-1 shows regression equations of different brands of ceterizine. Four different brands of ceterizine Zyrtec, zanlan, ronex and sedil is taken and their solutions of 100ppm, 50ppm, 25,12.5ppm and 6.25 ppm prepared for linearity study. Their percent assay is calculated and regression equation is obtained to predict further availability of drug. For linearity study I have prepared solutions of 100ppm, 50ppm, 25,12.5ppm and 6.25 ppm and three absorbances were taken. Figure 2 shows percent assay of different brands and figure 3-6 shows linearity of different brands at level 100ppm, 50ppm, 25,12.5ppm and 6.25 ppm. Correlation coefficient was found 1.00 for zyrtec and zanlan and 0.99 for ronex and sedil. According to guideline it should not be less than 0.99 and results of all brands squared correlation coefficient found within the limit.

CONCLUSION
Linear relationship was observed for different brands of ceterizine Zyrtec, zanlan, ronex and sedil in the concentration ranges of 100, 50, 25,12.5 and 6.25 ppm with correlation coefficient < 2. The correlation coefficient 1.00 for zyrtec and zanlan and 0.99 for ronex and sedil was found.

Table 1: % Regression equations of different brands of ceterizine

<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Regression equations</th>
<th>R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zyrtec</td>
<td>y = 0.0261x - 0.005</td>
<td>1</td>
</tr>
<tr>
<td>Zanlan</td>
<td>y = 0.0261x - 0.005</td>
<td>1</td>
</tr>
<tr>
<td>Ronex</td>
<td>y = 0.0262x - 0.0125</td>
<td>0.99</td>
</tr>
<tr>
<td>Sedil</td>
<td>y = 0.0263x - 0.0154</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Table 2: % assay of different brands of ceterizine brands

<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Average wt of tablet mg</th>
<th>Wt for 100 ppm</th>
<th>Absorbance at 229 nm</th>
<th>% assay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zyrtec</td>
<td>11.5</td>
<td>11.5</td>
<td>2.62</td>
<td>100.383</td>
</tr>
<tr>
<td>Zanlan</td>
<td>18</td>
<td>18</td>
<td>2.62</td>
<td>100.383</td>
</tr>
<tr>
<td>Ronex</td>
<td>16.8</td>
<td>16.8</td>
<td>2.61</td>
<td>100</td>
</tr>
<tr>
<td>Sedil</td>
<td>10.1</td>
<td>10.1</td>
<td>2.61</td>
<td>100</td>
</tr>
</tbody>
</table>
### Table 3: Descriptive of different brands

<table>
<thead>
<tr>
<th>ASSAY</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>95% Confidence Interval for Mean</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Upper Bound</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zyrtec</td>
<td>3</td>
<td>100.2967</td>
<td>.00577</td>
<td>.00333</td>
<td>100.2823</td>
<td>100.29</td>
<td>100.30</td>
</tr>
<tr>
<td>Zanlan</td>
<td>3</td>
<td>100.2967</td>
<td>.00577</td>
<td>.00333</td>
<td>100.2823</td>
<td>100.29</td>
<td>100.30</td>
</tr>
<tr>
<td>Ronex</td>
<td>3</td>
<td>99.9333</td>
<td>.05774</td>
<td>.03333</td>
<td>99.7899</td>
<td>99.90</td>
<td>100.00</td>
</tr>
<tr>
<td>Sedil</td>
<td>3</td>
<td>99.9667</td>
<td>.05774</td>
<td>.03333</td>
<td>99.8232</td>
<td>99.90</td>
<td>100.00</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>100.1233</td>
<td>.18480</td>
<td>.05335</td>
<td>100.0059</td>
<td>99.90</td>
<td>100.30</td>
</tr>
</tbody>
</table>

**Figure 1:** Structure of ceterizine

![](image)

% assay

![](image)
Figure 2: % assay of different brands

Figure 3: Linearity of Zyrtec

Figure 4: Linearity of Zalan
Figure 5: Linearity of Ronex

Figure 6: Linearity of Sedil

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