ASSAY OF DIFFERENT BRANDS OF CEFADROXIL BY USING SPECTROPHOTOMETRIC METHOD

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ABSTRACT

Cefadroxil[7-[amino-(4-hydroxyphenyl)acetyl]amino]-3-methyl-8-oxo-5-thia-1-azabicyclo[4.2.0]oct-2-ene-2-carboxylic acid monohydrate] is a semisynthetic and new broad spectrum antibacterial showing both Gram +ve and gram –ve pathogens. The aim of study to calculate the percentage assay of different brands of cefadroxil by using rapid, economical and less time consuming spectrophotometric method. Five dilutions of 100ppm, 50ppm, 25ppm, 12.5ppm and 6.25ppm for each brand of cefadroxil were prepared and check absorbance and calculate %assay. The results are within the limit of USP/BP specifications. Thus we can conclude that the method can be applied for the routine QC quantitative analysis of cefadroxil in active and tablet formulation.

Keywords: cefadroxil, broad spectrum, antibacterial, semi synthetic.

INTRODUCTION

Cefadroxil (fig.1) (7-[amino-(4-hydroxyphenyl)acetyl]amino) – 3-methyl – 8 – oxo – 5 – thia – 1- azabicyclo [4.2.0] oct – 2 – ene – 2 – carboxylic acid monohydrate) [1] is a semisynthetic and new broad spectrum antibacterial (showing both gram –ve and gram +ve pathogen) cephapolisin. When it is administered orally gives high chemotherapeutic potential. [2] Food and drug administration approved the use of cefadroxil in children and infants. Pharmacokinetics of cefadroxil are absorbed oral administration ,half-life is 50 to 100 %, Bioavailability is 75% , protein binding is 20% Volume of distribution is 0.3 L/kg and it crosses the placenta.[3] cefadroxil is active against urinary tract infection, Lower respiratory tract infections RTI , includes pneumonia and lung abscess caused by Streptococcus pneumoniae, streptococci, Staphylococcus aureus, Intra-abdominal infections, including peritonitis and intra-abdominal abscess, Gynecological infections, Septicemia Bone and joint infections caused by Staphylococcus aureus (including Penicillinase-producing strains) and highly effective in for treatment of soft tissue infection and therapy of skin[4].

In Literature studies shows to assessed tolerability and efficacy of cefadroxil in high compliance oral dosage regimen with urinary tract infection among 100 patients and divided randomly three groups containing three different doses .Results show recurrence rate is very slow in all three groups.[5]

In 10 healthy volunteers were studied oral pharmacokinetics effect of cefadroxil in parallel at doses of 250, 500, and 1,000 mg in three groups. Renal excretion of intact cefadroxil, were found to be 82, 79, and 77% of the above doses. Overall pharmacokinetics were shows linear in the 250- to 500-mg dose and renal clearances were 9 and 8 liters/h. At 100 mg it was 1.6hr and 500 mg, mean half-life was about 1.2 h. The decrease in clearance is related to saturation of renal tubular secretion of cefadroxil in active form[6].

Clinical studies of comparison of penicillin and cephapolosporin in therapy of beta- hemolytic streptococcal pharyngitis in 19 patients. Results of cure rate in penicillin group were 95% as compare with 95% cephapolosporin group. So, both results show no significant difference between penicillin and cephapolosporin [7].

The aim of study to calculate the percentage assay of different brands of cefadroxil by using rapid, economical and less time consuming spectrophotometric method.

EXPERIMENTAL

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

Wavelength Selection

About 100 ppm of cefadroxil solution was accurately prepared in H2O water. Solution was scanned in the UV region. The wavelength maxima (λ max) were observed at 475 nm and this wavelength was adopted for absorbance measurement.

Standard Stock solution

Accurately weighed 10 mg of cefadroxil standard was transferred to a volumetric flask and add sufficient water to produce 100 ml.

Sample Preparation

Take three different brands of cefadroxil (cedrax, cefabact, duricef, dromax) were purchased from different medical store located in Karachi, Pakistan. All tablets of cefadroxil, each brand have same batch number and lot number. All the five brands have long shelf life.

Weight 20 tablets of five different brands from the marketed sample were uniformly crushed with the help of a mortar and pestle and calculating the average weighed sample powder to 10 mg of cefadroxil was transferred into a volumetric flask containing 10mL water. The solutions were sonicated for 5 min and make up volume up to 100 ml with water.

PROCEDURE

Preparation of standard and sample solutions, the strength of solution is 100 ppm in 100 ml absorbance of the sample. After Preparation and standard preparation in 1cm cell at the wavelength of maximum absorbance at 475nm. In spectrophotometer with the blank solution. Calculate the quantity of cefadroxil in mg of per capsule.
RESULTS AND DISCUSSION

The aim of the study was to carry out the pharmaceutical assay on different brands (CEDRAX, CEFABACT, DURICEF AND DROMAX) of cefadroxil using spectrophotometer. Pharmaceutical company name, Brand names, average weight of tablets, weight for 100ppm in 100 ml, absorbance table 1 and % assay are shown in figure 2, table 1, 2.

Five dilutions of 100ppm, 50, 25, 12.5 and 6.25ppm for each brand of cefadroxil were prepared. Their absorbance taken to calculate the percentage assay. The linearity was detected by preparing solution of 100ppm, 50ppm, 25ppm, 12.5ppm and 6.25ppm of each brands of cefadroxil. This results shows that absorbance is directly proportion to concentration so, it is obeys to Beers Lambert law and assay of all brands are within range of USP and British Pharmacopeia linearity given in figure 3-6. we have done these types of assay for different brand which helpful for selecting drugs [8-18].

Table 1: Different Brands of Cefadroxil

<table>
<thead>
<tr>
<th>Pharma</th>
<th>Brand Name</th>
<th>Average wt of capsule mg</th>
<th>wt for 100 ppm in 100 ml</th>
<th>Absorbance at 475 nm</th>
<th>% assay</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Platinum</td>
<td>Cedorx</td>
<td>563</td>
<td>0.011</td>
<td>0.12</td>
</tr>
<tr>
<td>B</td>
<td>NabiQasim</td>
<td>Cefabact</td>
<td>577</td>
<td>0.011</td>
<td>0.121</td>
</tr>
<tr>
<td>C</td>
<td>GSK</td>
<td>Duricef</td>
<td>528</td>
<td>0.01</td>
<td>0.12</td>
</tr>
<tr>
<td>D</td>
<td>Bosh</td>
<td>Dromax</td>
<td>567</td>
<td>0.012</td>
<td>0.121</td>
</tr>
</tbody>
</table>

Table 2: % assay of different brands

<table>
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<tr>
<th>Brand Name</th>
<th>% assay</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>98.365574</td>
</tr>
<tr>
<td>B</td>
<td>99.18032787</td>
</tr>
<tr>
<td>C</td>
<td>98.365574</td>
</tr>
<tr>
<td>D</td>
<td>99.18032787</td>
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</tbody>
</table>

Table 3: Absorbance of different brands

<table>
<thead>
<tr>
<th>Conc.</th>
<th>Absorbance</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>100</td>
<td>0.121</td>
</tr>
<tr>
<td>50</td>
<td>0.061</td>
</tr>
<tr>
<td>25</td>
<td>0.036</td>
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<tr>
<td>12.5</td>
<td>0.014</td>
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</table>
Figure 6: Linearity plot for assay of D

REFERENCES


