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Original Article

Assessment of Efficacy of Cefpodoxime Proxetil with Cefixime For Treatment of Typhoid Fever in Paediatric Patients: A Comparative Study

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ABSTRACT

Background: Typhoid fever globally is one of the most serious infectious disease threats to public health on a global scale. Cefpodoxime proxetil is an orally absorbed broad spectrum third generation cephalosporin. It is a prodrug that is cleaved in the intestinal epithelium by nonspecific esterases to yield the active metabolite cefpodoxime. Cefpodoxime is used clinically in humans for the treatment of respiratory, urinary tract infections (UTIs), skin, and soft tissue infections.Hence; we planned the present study to assess and compare the efficacy of Cefpodoxime Proxetil and Cefixime for Treatment of Typhoid Fever in paediatric patients.

Materials & Methods: The present study included assessment efficacy of Cefpodoxime Proxetil and Cefixime for Treatment of Typhoid Fever. Only those patients who were confirmed of suffering from typhoid fever on culture diagnosis were included in the present study. All the 60 patients were divided randomly into two study groups; Group 1- included patients who were given Cefpodoxime Proxetil therapy 16 mg/kg/day, and group 2- included patients who were given Cefixime 20mg/kg/ day. Follow-up check-up of the entire patients wad done 3rd, 5th, 7th and 10th day of treatment. For analysing the results, were used SPSS software.

Results: In group 1 and group 2, 28 and 29 patients showed features of clinical cure respectively. 100 percent cases of group 1 and group 2 showed bacteriological cure. We didn't observe any significant difference while comparing the cure rate in both the study groups.

Conclusion: For treating uncomplicated cases of typhoid fever in paediatric patients, oral Cefpodoxime Proxetil is an effective option.

KEYWORDS: Cefixime, Cefpodoxime Proxetil, Typhoid Fever.

INTRODUCTION

Estimates for the year 2000 suggested that there were approximately 21.5 million infections and 200,000 deaths from typhoid fever globally each year, making the disease one of the most serious infectious disease threats to public health on a global scale.[1-3] Cefpodoxime proxetil is an orally absorbed broad spectrum third generation cephalosporinwhich is approved with once daily oral administration for treatment of skin infections. It is a prodrug that is cleaved in the intestinal epithelium by nonspecific esterases to yield the active metabolite cefpodoxime. Cefpodoxime exhibits good activity against many gram- positive and gram-negative organisms and is used clinically in humans for the treatment of respiratory, urinary tract infections (UTIs), skin, and soft tissue infections.[4-7] Literature quotes paucity of data evaluating Cefpodoxime Proxetil in invasive typhoidal salmonellosis. Hence; we planned the present study to assess and compare the efficacy of Cefpodoxime Proxetil and Cefixime for Treatment of Typhoid Fever in paediatric patients.

MATERIALS & METHODS

The present study was conducted in the department of paediatrics, Dhanalakshmi Srinivasan Medical College and

Hospital, Perambalur, Tamilnadu (India) and included assessment efficacy of Cefpodoxime Proxetil and Cefixime for Treatment of Typhoid Fever. Ethical approval was taken from institutional ethical committee and written consent was obtained from the parents/ guardians of all the patients after explaining in detail the entire research protocol. Inclusion criteria for the present study included:

- Patients between the age group of 6 months to 18 years of age,
- Patients with absence of any systemic illness,
- Patients with any known drug allergy,
- Patients with negative history of use of any form of antibiotic therapy in the past one month,
- Patients with clinical features suspected of typhoid fever

Blood count, WIDAL and blood culture was done in all the paediatric patients which were provisionally diagnosed with typhoid fever. Only those patients who were confirmed of suffering from typhoid fever on culture diagnosis were included in the present study. Repetition of blood culture was done in all the patients on the tenth day of treatment therapy. All the 60 patients were divided randomly into two study groups; Group 1- included patients who were given Cefpodoxime Proxetil therapy16 mg/kg/day, and group 2- included patients who were given Cefixime20mg/kg/ day.Follow-up check-up of the entire patients wad done 3rd, 5th, 7th and 10th day of treatment. Complete resolution of all presenting symptoms and signs after 10 days of therapy were defined as clinical cure of the patients while elimination of originally isolated pathogens were defined as bacteriological cure. All the results were recorded on the excel sheet. For analysing the results, were used SPSS software. Student t test and Mann Whitney test were used for assessment of level of significance. P- Value of less than 0.05 was taken as significant.

Graph 1: Demographic details of the patients of both the study groups

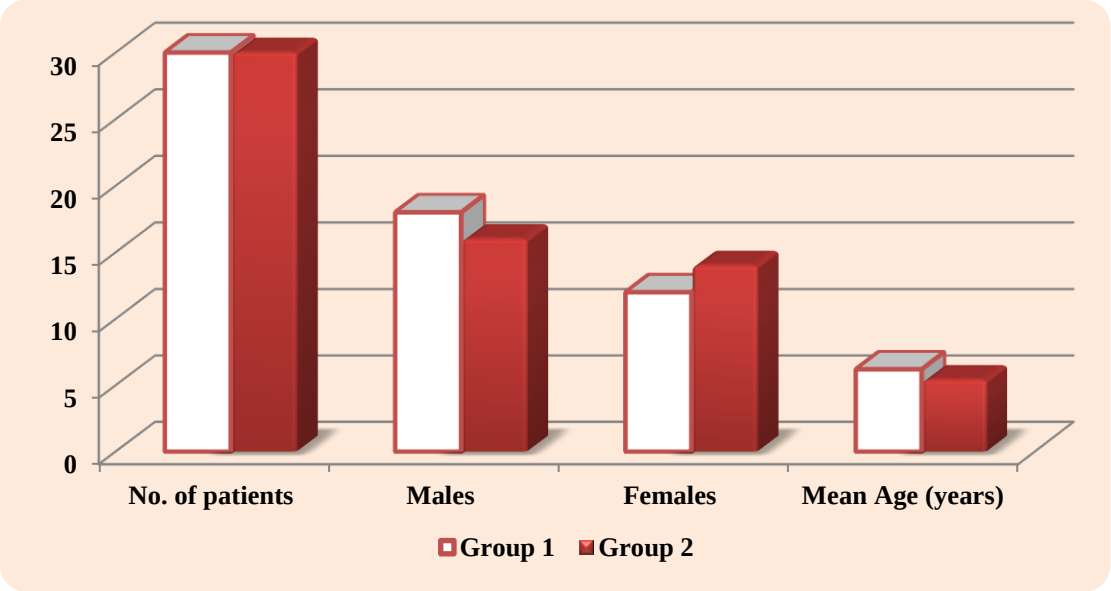

Table 1: Comparison of efficacy of cefpodoxime proxetil and cefixime

Parameter	Group 1	Group 2	p- value
Baseline temperature (Degree C)	39.6	39.1	0.56
Clinical cure (No. of patients)	28/30	29/30	0.8
Bacteriological cure (No. of patients)	30/30	3030	1

RESULTS

In the present study a total of 60 paediatric patients were enrolled and were randomly divided into two study groups with 30 patients in each group. Mean age of the patients of group 1 and group 2 was 6.2 and 5.4 years respectively. 18 patients out of 30 in group were males while 16 patients out of 30 patients were males as shown in Graph 1.Table 1 shows the comparison of efficacy of cefpodoxime proxetil and cefixime. Mean baseline temperature of patients of group 1 and group 2 was 39.6 and 39.1 degree centigrade respectively. As far as clinical cure cases was concerned, in group 1 and group 2, 28 and 29 patients showed features of clinical cure respectively. 100 percent cases of group 1 and group 2 showed bacteriological cure. We didn't observe any significant difference while comparing the cure rate in both groups.

DISCUSSION

Cefpodoxime Proxetil (CP) is widely used in paediatric infectious diseases except typhoid fever; it is almost similar to cefixime in its pharmacological and antimicrobial properties but cheaper than cefixime.[7-9] Hence; we planned the present study to assess and compare the efficacy of Cefpodoxime Proxetil and Cefixime for Treatment of Typhoid Fever in paediatric patients.

In the present study, we didn't observe any significant difference while comparing the clinical and bacteriological cure rate in patients of the two study groups (P- value > 0.05). Asmar BI et al compared the use of once-a-day cefpodoxime proxetil to once-a-day cefixime in the treatment of acute suppurative otitis media. A total of 368 patients (age 2 months to 17 years) were randomized to receive either cefpodoxime or cefixime in a 2:1 ratio (245 cefpodoxime, 123 cefixime); 236 patients (155 cefpodoxime, 81 cefixime) were evaluable for drug efficacy. Patients received either cefpodoxime proxetil oral suspension (10 mg/kg/day, once daily for 10 days) or cefixime oral suspension (8 mg/kg/day, once daily for 10 days). Clinical evaluations were performed before treatment (study day 1), at an interim visit (study day 3 through 6), at the end of therapy (study day 12 through 15), and at final follow-up (study day 25 through 38). Microbiologic evaluations were performed at enrollment and whenever appropriate thereafter. End-of-therapy clinical cure rates in evaluable patients were 56% for the cefpodoxime group and 54% for the cefixime group. Clinical improvement rates were 27% for both groups. Clinical response rates were not significantly different between treatment groups. At long-term follow-up, 17% of patients in the cefpodoxime group and 20% in the cefixime group had a recurrence of infection. Drug-related adverse events (eg, diarrhea, diaper rash, vomiting, rash) occurred in 23.3% of cefpodoxime-treated patients and 17.9% of cefixime-treated patients. These findings suggested that cefpodoxime proxetil administered once daily is as effective and safe as cefixime given once daily in the treatment of acute suppurative otitis media in pediatric patients.[9] Cao XT et al compared cefixime, an orally administered third generation cephalosporin, with ofloxacin for the treatment of uncomplicated typhoid fever in children. In an open trial children with suspected typhoid fever were randomized to receive either ofloxacin (10 mg/kg/day in two divided doses) for 5 days or cefixime (20 mg/kg/day in two divided doses) for 7 days. S. typhi was isolated from 82 patients (44 in the cefixime group, 38 in the ofloxacin group) and 70 (85%) of the isolates were multidrug-resistant. Median (95% confidence interval, range) fever clearance times were 4.4 (4 to 5.2, 0.2 to 9.9) days for ofloxacin recipients and 8.5 (4.2 to 9, 1.8 to 15.2) days for cefixime-treated patients (P < 0.0001). There were 11 treatment failures (10 acute and one relapse) in the cefixime group and 1 acute treatment failure in the ofloxacin group (mean difference, 22%; 95% confidence interval, 9 to 36%). Short course treatment with cefixime may provide a useful alternative treatment in cases of uncomplicated typhoid fever in children, but it is less effective than short course treatment with ofloxacin.[10]

Bhutta ZA et al randomly allocated 80 children with suspected multidrug-resistant tyhpoid fever to therapy with either cefixime or ceftriaxone. Of these, an alternative diagnosis was subsequently made in 10 children and another 10 were excluded because cultures were negative. In 9 cases the typhoidal organisms isolated were susceptible to first-line drugs. In all, 50 children were randomly allocated to receive therapy with either intravenous ceftriaxone (65 mg/kg/day once daily, Group A, n = 25) or oral cefixime (10 mg/kg/day divided every 12 hours, Group B, n = 25) for 14 days. The two groups were comparable in their clinical characteristics, duration and severity of illness at the time of admission. The time to defervescence was comparable in both groups (8.3 +/- 3.7 vs. 8.0 +/- 4.1 days, P = not significant). An equal number (3 in each group) failed to respond and underwent a change in therapy. Three children in Group A and one in Group B relapsed. No adverse effects were seen in either group during the course of therapy. Their data suggested that oral cefixime can be used as effectively as parenterally administered ceftriaxone for management of typhoid fever in children.[11] Shakur MS et al evaluated clinical and bacteriological efficacy of Cefpodoxime Proxetil (CP) in typhoid fever in comparison to cefixime (CF). They assessed 140 children with suspected typhoid fever. Fulfilling inclusion criteria finally 40 culture confirmed typhoid fever were allocated in randomized double blind clinical trial (RCT) to receive therapy with either oral CP (16 mg/kg/day, n = 21) or oral CF (20 mg/kg/day, n = 19) for 10 days. The two groups were comparable in their clinical and baseline characteristics. The clinical efficacy was similar in the two groups with only 2 (one in each group) clinical failures and all showing bacteriological eradication on subsequent blood culture. The time of defervescence was comparable in both groups, with no relapse during 3 months follow up and no significant adverse effect. CP reduced the treatment cost by 33% in comparison to cefixime. Their study suggested CP is effective, safe and cheaper oral option for treatment of typhoid fever in children.[12]

CONCLUSION

We conclude that for treating uncomplicated cases of typhoid fever in paediatric patients, oral Cefpodoxime Proxetil is an effective option. However, future studies are recommended with larger sample size for better exploration of this field of paediatric medicine.

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