

Comparative Assessment of Ceftriaxone or Chloramphenicol in Treatment of Typhoid Fever at a Tertiary Care Teaching Centre

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ABSTRACT

Background: Enteric fever (typhoid and paratyphoid fevers) is caused by fecal oral transmission of *Salmonella enterica* serotypes Typhi or Paratyphi A. Chloramphenicol has been the antibiotic of choice for patients with typhoid fever for more than 30 years, although ampicillin and cotrimoxazole have been introduced as alternatives. Hence; present study was conducted to evaluate and compare the efficacy of ceftriaxone and chloramphenicol in adults.

Materials & Methods: The present study included evaluation of efficacy of patients who reported with typhoid fever. A total of 28 subjects with typhoid fever were included in the present study and were broadly divided into two study groups as follows: Group 1: Subjects who were given ceftriaxone therapy, Group 2: Subjects who were given chloramphenicol therapy. The effects of therapy were assessed both clinically and bacteriologically.

Results: Any significant difference was not observed while comparing the efficacy of both the antibiotic treatment therapies in treating patients with typhoid fever.

Conclusion: Both the treatment options are equally effective in treating typhoid fever patients.

Key words: Ceftriaxone, Chloramphenicol, Enteric Fever.

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INTRODUCTION

Enteric fever (typhoid and paratyphoid fevers) is caused by fecal oral transmission of *Salmonella enterica* serotypes Typhi or Paratyphi A.^{1,2} Emergence of multidrug resistance and decreased ciprofloxacin susceptibility (DCS) in *Salmonella enterica* serovar Typhi in South Asia have rendered older drugs, including ampicillin, chloramphenicol, trimethoprim - sulphamethoxazole, ciprofloxacin, and ofloxacin, ineffective or suboptimal for typhoid fever.³⁻⁵

Ideally, treatment should be safe and available for adults and children in shortened courses of 5 days, cause defervescence within 1 week, render blood and stool cultures sterile, and prevent relapse. Chloramphenicol has been the antibiotic of choice for patients with typhoid fever for more than 30 years, although ampicillin and cotrimoxazole have been introduced as alternatives.⁶⁻⁸

Hence; present study was conducted to evaluate and compare the efficacy of ceftriaxone and chloramphenicol in adults.

MATERIALS & METHODS

The present study was planned in the Department of General Medicine, Teerthanker Mahaveer Medical College & Research

Centre, Moradabad, Uttar Pradesh (India) and it included evaluation of efficacy of patients who reported with typhoid fever. A total of 28 subjects with typhoid fever were included in the present study and were broadly divided into two study groups as follows:

- Group 1: Subjects who were given ceftriaxone therapy,
 - Group 2: Subjects who were given chloramphenicol therapy
- Regular follow-up and monitoring of all the patients was done till the end of the treatment. After every six hours, recording of the frequency and consistency of the stool specimens of all the patients was done. The effects of therapy were assessed both clinically and bacteriologically on the basis of criteria as described previously in the literature.⁹ Analysis of all the results was done by SPSS software. Student t test was used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

A total of 28 patients were included in the present study and were broadly divided into two study groups; group 1 and group 2. There were 14 patients in each group. Mean age of the patients of group 1 and group 2 were found to be 23.1 and 24.5 years respectively.

There were 8 males in group 1 and 7 males in group 2. Mean duration of Diarrhea in patients of group 1 and group 2 were 6 and 5 days respectively.

Any significant difference was not observed while comparing the efficacy of both the antibiotic treatment therapies in treating patients with typhoid fever.

Table 1: Demographic and clinical details of the subjects

Parameter	Group 1	Group 2
Number of subjects	14	14
Mean age (years)	23.1	24.5
Males	8	7
Females	6	7
Duration of fever (days)	7	7
Duration of diarrhoea (days)	6	5

Table 2: Response of the patients to the treatment

Parameter	Group 1 (N= 14)	Group 2 (N= 14)	p- value
Cure (clinically)	13	12	0.72
Relapse	1	2	
Blood culture positive for S.typhi at 14 days	0	0	
Stool culture positive for S.typhi at 14 days	0	0	

DISCUSSION

In the present study, any significant difference was not observed while comparing the efficacy of both the treatment therapies in treating patients with typhoid fever. The prognosis for a patient with enteric fever depends on the rapidity of diagnosis and treatment with an appropriate antibiotic. Other factors include the patient's age, general state of health, and nutrition; the causative *Salmonella* serotype; and the appearance of complications. Infants and children with underlying malnutrition and those infected with multidrug resistant isolates are at higher risk of adverse outcomes. Although additional treatment with dexamethasone (3 mg/kg for the initial dose, followed by 1 mg/kg every 6 hours for 48 hours) has been recommended among severely ill patients with shock, obtundation, stupor, or coma, this must be done only under strictly controlled conditions and supervision, and signs of abdominal complications may be masked.⁹⁻¹¹

Despite appropriate treatment, some 2-4% of infected children relapse after initial clinical response to treatment. Individuals who excrete *S. typhi* for more than three months after infection are regarded as chronic carriers. However, the risk of becoming a carrier is low in children and increases with age, but in general it occurs in less than 2% of all infected children.¹²

Tatli MM et al compared ceftriaxone with chloramphenicol for treatment of 72 children who had bacteriologically confirmed typhoid fever. Ceftriaxone was given at a dose of 75 mg/kg per day (maximally 2 g/day) intravenously, in two doses until defervescence and continued 5 days after that time. Chloramphenicol was given at a dose of 75 mg/kg per day (maximally 2 g/day) in four doses for 14 days. Mean defervescence time was in 5.4 days in the ceftriaxone group and 4.2 days in the chloramphenicol group ($P=0.04$). Clinical cure without complications was achieved in all patients in both groups.

No patient relapsed in the ceftriaxone group, and four patients relapsed in the chloramphenicol group ($P=0.048$). The overall results of this study suggested that a flexible-duration of ceftriaxone therapy given until defervescence time, followed by an additional 5 days of therapy is a reasonable alternative to conventional 14-day chloramphenicol treatment in children with typhoid fever.¹³ Thaver D et al reviewed evidence supporting use of fluoroquinolones as first line agents over other antibiotics for treating typhoid and paratyphoid fever (enteric fever). In adults, fluoroquinolones may be better than chloramphenicol for preventing clinical relapse. Data were limited for other comparisons, particularly for children.¹⁴ Alam MN et al The compared the efficacy of two regimens of ciprofloxacin on 69 patients with enteric fever, 52.2% of whom had infection with multidrug-resistant (MDR) strains of *Salmonella typhi* or *S. paratyphi*. Patients were randomly assigned to two regimens (10 days versus 14 days) of ciprofloxacin (500 mg twice a day). The mean +/- SD time required for defervescence was similar for both regimens (4.2 +/- 1.9 days in the 10-day group and 4.9 +/- 2.6 days in the 14-day group). A 100% cure was observed in each treatment group and no serious side effects were observed. Relapse occurred in two patients (14-day regimen). Only one patient (14-day regimen) had growth of *S. typhi* in stool culture at the time of the first follow-up three days after completion of therapy. Follow-up studies on available patients on two, six, and 12 months after completion of therapy revealed that all patients had negative stool cultures for *S. typhi* and *S. paratyphi*. This study indicated that ciprofloxacin may be recommended as an initial therapy for enteric fever for adult men and nonpregnant and nonlactating women in areas where MDR strains of *S. typhi* and *S. paratyphi* are prevalent, and that 500 mg twice a day of the drug given for 10 days is as effective as 14 days at the same dosage.¹⁵

CONCLUSION

Under the light of above results, it can be concluded that both the treatment options are equally effective in treating typhoid fever patients. However; future studies for better exploration of this field of medicine are recommended.

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