

Comparative Evaluation of Efficacy of Different Line of Treatment for Treating Typhoid Patients: An Institutional Based Study

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ABSTRACT

Background: Typhoid fever is an infectious disease of global distribution. Most commonly used antibiotics for the treatment of typhoid fever are fluoroquinolone and third-generation cephalosporins. Hence; Present study was planned to compare the efficacy of in treating typhoid patients.

Materials & Methods: The present study included evaluation and comparison of efficacy of chloramphenicol and ciprofloxacin in treating typhoid patients. A total of 40 patients with typhoid fever were included in the present study. All the patients were broadly into two study groups with 20 patients in each group, as follows: Group A: Patients who were given 50 mg/kg chloramphenicol every 6 hours; and Group B: Patients who were given ciprofloxacin 500 mg every 12 hours. Patients were measured cured if there was absence of fever, and other symptoms at the end of the treatment course. All the results were analyzed by SPSS software.

Results: 100 percent of the patients of group A responded well to the treatment protocol, while 81.25 percent of the patients of the group B responded well to the treatment protocol.

Conclusion: For treating typhoid patients, chloramphenicol is a better line of treatment in comparison to ciprofloxacin

Key words: Chloramphenicol, Ciprofloxacin, Typhoid.


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INTRODUCTION

Typhoid fever is an infectious disease of global distribution. Control of typhoid fever relies on clinical information, diagnosis, and an understanding for the epidemiology of the disease. Despite the breadth of work done so far, much is not known about the biology of this human-adapted bacterial pathogen and the complexity of the disease in endemic areas, especially those in Africa.¹⁻³

The main barriers to control are vaccines that are not immunogenic in very young children and the development of multidrug resistance, which threatens efficacy of antimicrobial chemotherapy. Clinicians, microbiologists, and epidemiologists worldwide need to be familiar with shifting trends in enteric fever. Typhoid fever is caused by *Salmonella enterica* serovar Typhi.^{4, 5} Though salmonellosis is rare in developed and industrialized countries, it still remains a serious problem in most of the developing countries especially Southeast Asian countries, Africa and Latin America.⁶

Most commonly used antibiotics for the treatment of typhoid fever are fluoroquinolone such as ciprofloxacin, ofloxacin and pefloxacin and third - generation cephalosporins such as ceftriaxone or

cefotaxime. Antibiotic treatments are often ineffective in carriers with gallstones. In these carriers, *Salmonella* are resistant to bile forming biofilm on the gallbladder conferring antimicrobial resistance to bacteria.^{7, 8} Hence; present study was planned to compare the efficacy of in treating typhoid patients.

MATERIALS & METHODS

The present study was planned in the Department of General Medicine, Rama Medical College Hospital & Research Centre, Pilkhuwa, Hapur, Uttar Pradesh (India) and it included evaluation and comparison of efficacy of chloramphenicol and ciprofloxacin in treating typhoid patients. Written consent from all the patients after explaining in detail the entire research protocol was obtained. A total of 64 patients with typhoid fever were included in the present study. All the patients were broadly into two study groups with 32 patients in each group, as follows:

- **Group A:** Patients who were given 50 mg/kg chloramphenicol every 6 hours;
- **Group B:** Patients who were given ciprofloxacin 500 mg every 12 hours.

Inclusion Criteria

- Patients positive for blood culture for *S. typhi*
- Patients with negative history of any other systemic illness,
- Patients with any known drug allergy

Detailed clinical history of all the patients was obtained. Routine blood investigations were carried out in all the patients. After confirming the diagnosis through microbiological testing, treatment

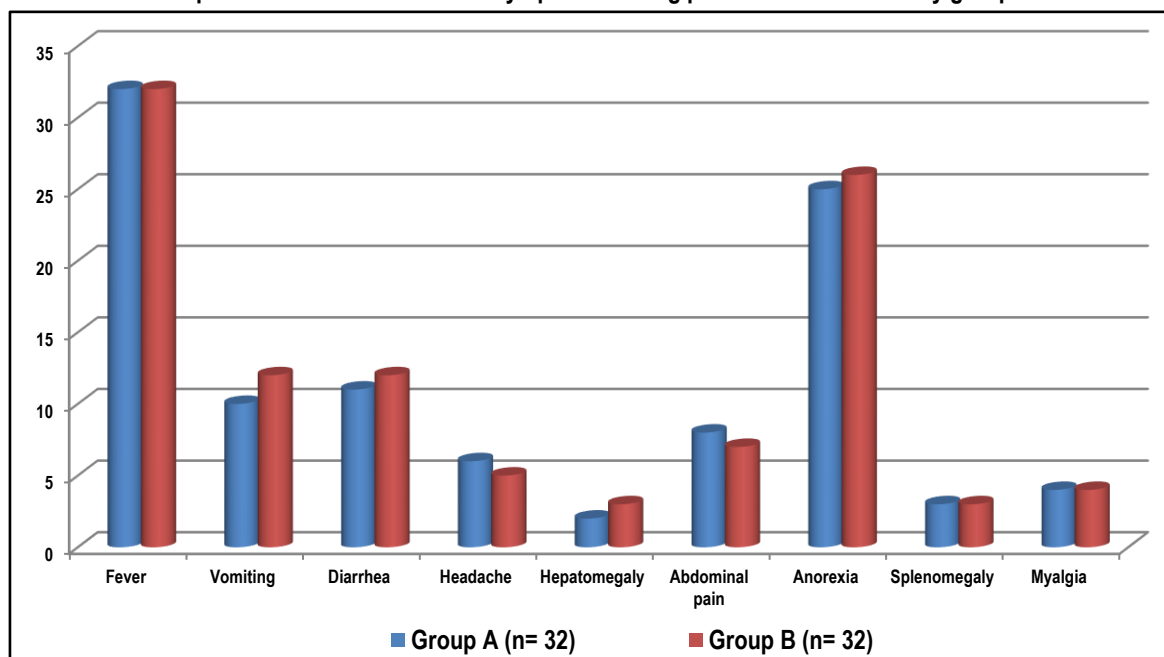
in both the study groups was started. Widal agglutination test was carried out in all the patients.⁹ Antimicrobial therapy was continued till the archival of normal body temperature. Complications, if any, were recorded separately. Patients were measured cured if there was absence of fever, and other symptoms at the end of the treatment course. All the results were analyzed by SPSS software. Chi-square test was used for assessment of level of significance. P-value of less than 0.05 was taken as significant.

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

Clinical parameter	Group A (n= 32)	Group B (n= 32)
Mean age (years)	28.5	33.1
Males	19	21
Females	13	11
Total	32	32

Table 2: Clinical profile of patients of the two study groups

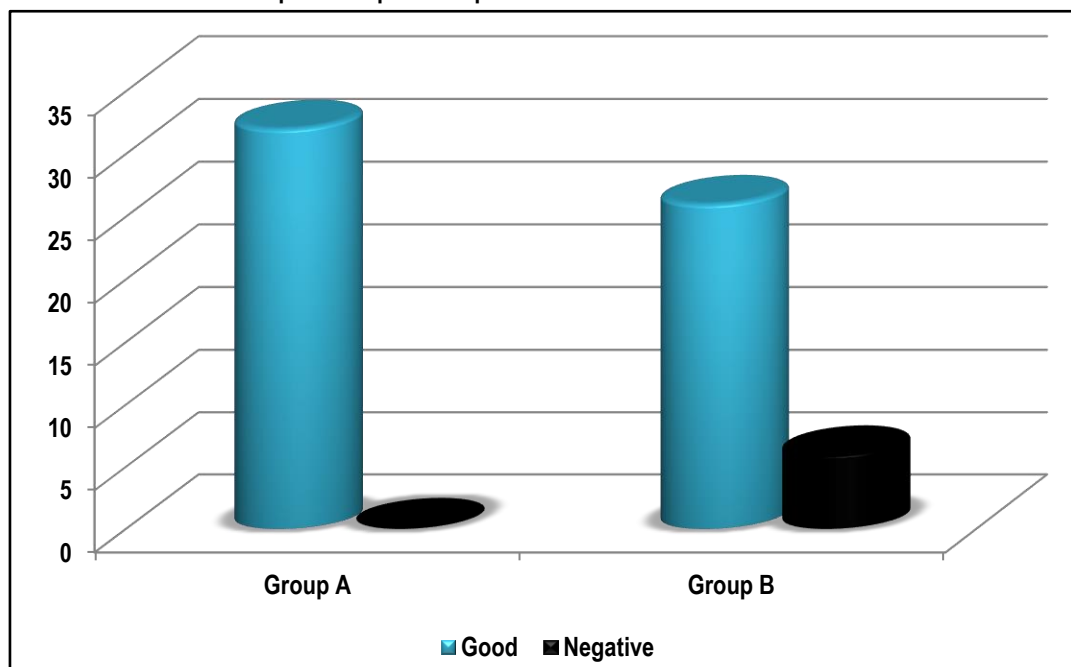
Clinical parameter	Group A (n= 32)	Group B (n= 32)
Fever	32	32
Vomiting	10	12
Diarrhoea	11	12
Headache	6	5
Hepatomegaly	2	3
Abdominal pain	8	7
Anorexia	25	26
Splenomegaly	3	3
Myalgia	4	4

Graph 1: Distribution of Clinical symptoms among patients of the two study groups**Table 3: Comparison of response to treatment among different study groups**

Response to treatment	Group A (n)	Group B (n)	P- value
Good	32	26	0.02*
Negative	0	6	
Total	32	32	

*: Significant

Graph 2: Response of patients to different line of treatment



RESULTS

In the present study, a total of 64 patients with typhoid fever were analyzed. All the patients were broadly divided into two study groups, with 32 patients in each group. Mean age of the subjects of group A and group B was 28.5 and 33.1 years respectively. There 19 males and 13 females in group A, while there were 21 males and 11 females in group B. Fever and anorexia were the most commonly encountered clinical symptoms among patients of both the study groups. 100 percent of the patients of group A responded well to the treatment protocol, while 81.25 percent of the patients of the group B responded well to the treatment protocol.

DISCUSSION

In the present study, fever and anorexia were the most commonly encountered clinical symptoms among patients of both the study groups. 100 percent of the patients of group A responded well to the treatment protocol, while 81.25 percent of the patients of the group B responded well to the treatment protocol. Islam A et al compared the therapeutic efficacy of ceftriaxone given once daily for 5 days and chloramphenicol given four times daily for 14 days, a controlled trial was carried out with 59 patients who were culture positive for *Salmonella typhi*. Ceftriaxone was given to 28 patients in once-daily intravenous doses of 75 mg/kg of body weight to children and 4 g to adults for 5 days; chloramphenicol was given to 31 patients at a dosage of 60 mg/kg/day until defervescence and then at 40 mg/kg/day to complete 14 days of treatment. All *Salmonella* isolates were susceptible to both antibiotics. Clinical cures (defervescence without complications, no relapse, and no need for further treatment) occurred in 79% of the patients treated with ceftriaxone and 90% of those treated with chloramphenicol ($P = 0.37$). On the third day of treatment, blood cultures were positive for *S. typhi* for 60% of the patients in the chloramphenicol group and 0% of the ceftriaxone group ($P = 0.001$). Defervescence occurred in half the patients in both groups during the first 7 days, but on days 9 to 13 after the start of treatment, nine patients in the

ceftriaxone group, compared with six patients in the chloramphenicol group, remained febrile ($P = 0.4$). The median hematocrit and total leukocyte counts at day 14 were significantly lower for the chloramphenicol group than those for the ceftriaxone group ($P = 0.01$ and $P = 0.02$, respectively). These results indicated that the effects of therapy with ceftriaxone for typhoid fever differed from those of chloramphenicol therapy in that blood cultures became negative earlier, prolonged fever persisted in some patients, and bone marrow suppression was reduced. They concluded that a short, 5-day course of ceftriaxone is a useful alternative to conventional 14-day chloramphenicol therapy in the treatment of typhoid fever.¹⁰

The wide distribution and high prevalence of multidrug resistance (MDR) among *Salmonella* has led to fluoroquinolones assuming a primary role in the therapy for invasive salmonellosis. Some investigators have noted increases in the prevalence of more susceptible *S. Typhi* and *S. Paratyphi* strains coinciding with a switch from traditional first-line antimicrobials to fluoroquinolones for the management of enteric fever. However, the widespread use of fluoroquinolones has also been associated with decreased susceptibility and documented resistance to this class of drugs. A single chromosomal mutation in the quinolone resistance determining region (QRDR) of the *gyrA* gene may be sufficient to result in decreased ciprofloxacin susceptibility (DCS). Nalidixic acid resistance in the presence of ciprofloxacin susceptibility had been thought to be a reliable indicator of DCS, but this is now known not to be the case and many have suggested that DCS is most reliably determined by measurement of the ciprofloxacin minimum inhibitory concentration.^{10, 11} Alam MN et al compared the efficacy of two regimens of ciprofloxacin in a randomized study conducted 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 \pm SD time required for defervescence was similar for both regimens (4.2 \pm 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.¹²

CONCLUSION

Under the light of above mentioned data, it can be concluded that for treating typhoid patients, chloramphenicol is a better line of treatment in comparison to ciprofloxacin. However; future studies are recommended.

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