

Role of Azithromycin in the Treatment of Typhoid Fever in Children

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ABSTRACT

Aim: To determine the efficacy of azithromycin in the treatment of typhoid fever in children.

Study design: It was a descriptive case series.

Duration: Six months from January 2012 to June 2012.

Settings: Department of Pediatric Medicine Unit-I, SIMS/Services Hospital, Lahore.

Methods: A total of 110 cases fulfilling the inclusion/exclusion criteria were enrolled in the study.

Results: In this study 8.78±3.87 years was the commonest age, 68(61.82%) male cases and 42(38.18%) female cases, efficacy of azithromycin in the treatment of typhoid fever in children was calculated and in 96(87.27%) cases, efficacy was recorded while only 14(12.73%) cases could not be treated effectively. The results of the study reveal that azithromycin is safe and effective drug for the treatment of typhoid fever in children.

Conclusion: The results of the study reveal that azithromycin is safe and effective drug for the treatment of typhoid fever in children.

Keywords: Typhoid fever, azithromycin, children

INTRODUCTION

Typhoid fever is an acute illness associated with fever that is most often caused by the *Salmonella typhi* bacteria. Its significant involvement in human mortality and morbidity is a major health concern.¹ In 2006, the World Health Organization (WHO) estimated incidence of 16 to 33 million typhoid fever cases globally every year, with 500,000 to 600,000 deaths and case fatality rate of between 1.5 and 3.8%.² With more than 80% of global cases, South Asia is the most commonly reported region for the acquisition of typhoid fever since 1996 to 2005. There are several hospital based studies carried out in Pakistan that described high incidence rate of typhoid fever in children. According to an estimate, 250,000 deaths occur each year in Pakistan among which typhoid fever is one of the leading cause³.

Salmonella that is resistant to ampicillin, chloramphenicol and trimethoprim-sulfamethoxazole is known as multidrug resistance (MDR). Pakistan is one of the 6 countries with 80% resistance to these drugs. The emergence of developing MDR to ampicillin, chloramphenicol and trimethoprim-sulfamethoxazole leads to use of other drugs like ciprofloxacin, ceftriaxone, and azithromycin. Fluoroquinolones or third generation cephalosporins are the drugs of choice for the treatment of typhoid fever.^{4,5,7} In recent years, however, the emergence of resistance to quinolones has placed tremendous pressure on public health systems in developing

countries as treatment options are limited^{6,7}. For these patients, the recommended first line drug is ceftriaxone. Azithromycin is also promising in these patients, as it significantly reduces relapse rate as compared with ceftriaxone^{8,9}.

In another study conducted in Bangladesh to determine the efficacy and safety of azithromycin in the treatment of uncomplicated typhoid fever in children and found that efficacy of treatment with azithromycin in 94% patients¹⁰.

The emergence of multidrug resistance in Pakistan as well as in other countries leads to use of other antimicrobial agents. So, this study is designed to assess the efficacy of azithromycin in their treatment of typhoid fever in children and will help in the better selection of drugs in the treatment of enteric fever in children. The low cost of this drug and its single dose per day is going to be very economical for the patients.

MATERIAL & METHODS

A total of 110 children, who were diagnosed as typhoid fever on the basis of their clinical presentation of febrile illness supported by positive typhoid IgM, between 3 to 15 years of age of either gender were included in the study while patients of typhoid fever who developed complications of the disease were excluded from the study. Informed consent was taken from the parents of the children and they were explained in detail in treatment procedure. All patients were given azithromycin in single dosage of 10mg/kg/day. Patients were

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admitted by examined daily by the researcher and efficacy to treatment was noted. Efficacy of treatment was established (complete resolution of fever (98.6F) within 96 hours of treatment and patients remain a febrile for next 48 hours). The data was collected on a pre-designed proforma. Effect modifier (duration of fever before treatment) were addressed through stratification.

The data was entered in the SPSS version 12.0 and analyzed accordingly. Age was presented as mean and standard deviation. Gender and efficacy of treatment was presented as frequency and percentages. Data was stratified for duration of fever (<2, >5 days) before treatment.

RESULTS

Age distribution of the patients was done, 29(26.36%) were recorded between 3-5 years, 65(59.09%) were between 6-10 years and 16(14.55%) were between 11-15 years of age and 8.78+3.87 was recorded as mean and s.d.(Table 1). Gender distribution of the patients shows 68(61.82%) male cases and 42(38.18%) female cases (Table 2). Efficacy of azithromycin in the treatment of typhoid fever in children was calculated and in 96(87.27%) cases, efficacy was recorded while only 14(12.73%) cases could not be treated effectively (Table 3).

Stratification of efficacy of azithromycin in treatment of typhoid fever in children with regards to duration of fever reveals that 77(70%) cases were suffering from fever >5 days before treatment and out of them 69(89.61%) were treated effectively while <2 days of duration of fever before treatment was recorded in 33(30%) cases and out of them 27(81.82%) cases were treated effectively (Table 4).

Table 1: Age Distribution (n=110)

Age(years)	n	%
3-5	29	26.36
6-10	65	59.09
11-15	16	14.55

Table 2: Gender Distribution of The Patients (n=110)

Gender	n	%
Male	68	61.82
Female	42	38.18

Table 3: Efficacy of Azithromycin in the Treatment of Typhoid Fever In Children (n=110)

Efficacy	n	%
Yes	96	87.27
No	14	12.73

Table 4: Stratification of Efficacy of Azithromycin in the Treatment of Typhoid Fever In Children with Regards to Duration of Fever (n=110)

Duration of fever before treatment	No. of cases	%	Efficacy	
			No. of cases	%
>5 days	77	70	69/77	89.61
<2 days	33	30	27/33	81.82

DISCUSSION

The emergence of multi drug resistance in Pakistan as well as in other countries leads to use of other antimicrobial agents. This study was designed to assess the efficacy of azithromycin in their treatment of typhoid fever in children and will help in the better selection of drugs in the treatment of enteric fever in children. The low cost of this drug and its single dose per day is going to be very economical for the patients.

For many decades, antibiotics such as chloramphenicol, ampicillin, and cotrimoxazole were used for treating enteric fever¹¹. The emergence of multiple-drug-resistant (MDR)

Salmonella strains, which are resistant to chloramphenicol, ampicillin, and cotrimoxazole, have changed treatment options. MDR strains of *S. Typhi* have been reported from all parts of the world.

Azithromycin is found to be an effective drug for treating uncomplicated typhoid fever in children with efficacy rate of more than 90%. Treatment failure rates of 9.3% have been observed in earlier studies on azithromycin¹². Two other studies have reported a clinical cure rate of 82% and 92%¹³⁻¹⁴. Efficacy of azithromycin in our study is also similar to above studies i.e., 87.27%.

Another study conducted by Aggarwal A and colleagues¹⁵ to evaluate the efficacy and safety of azithromycin (20mg/ kg/day for 6 days) for the treatment of uncomplicated typhoid fever. Of the patients enrolled based on a clinical definition of typhoid fever, 109 (93.1%) completed the study, mean (SD) of duration of fever at presentation was 9.1(4.5) days. Clinical cure was seen in 102 (93.5%) subjects, while 7 were withdrawn from the study because of clinical deterioration. Mean day of response was 3.45±1.97. No serious adverse event was observed. Global well being assessed by the investigator and subjects was good in 95% cases which was done at the end of the treatment. Azithromycin was found to be safe and efficacious for the management of uncomplicated typhoid fever.

Emmanuel E Effa et al¹⁶ compared azithromycin with other antibiotics for treating uncomplicated enteric fever and Azithromycin found better than fluoroquinolone drugs in populations that included participants with drug-resistant strains and concluded that Azithromycin may perform better than ceftriaxone.

The limitation of the study was that we did not compare azithromycin with any other antibiotics and any side effects of the drug but considering the other studies mentioned above, we may consider azithromycin as a safe drug and further trials may be conducted for comparison with other antibiotics as well. However, the low cost of this drug and its single dose per day is going to be very economical for the patients in our setup.

CONCLUSION

The results of the study reveal that azithromycin is safe and effective drug for the treatment of typhoid fever in children.

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