

Assessment of clinical profile in enteric fever

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Abstract

The term 'enteric fever' is a collective term that refers to severe typhoid and paratyphoid. Typhoid fever, also known simply as typhoid, is a bacterial infection due to *Salmonella typhi* that causes symptoms which may vary from mild to severe and usually begin six to thirty days after exposure. The objective of the present study is to evaluate the clinical profile and pattern of various drugs used in the treatment of typhoid fever.

The patients admitted to IPD of SRMS Institute of Medical Sciences, Bareilly were considered in the study. The approval of the Ethical Committee is taken from the Hospital. The written consent also obtained from the patients. The total 50 patients were included in the study. The mode of presentation, clinical course, treatment history, laboratory investigations reports, antibiotic administered response to therapy and the complications were recorded.

Maximum resistance for chloramphenicol, amoxicillin, and ampicillin was seen as compared to ceftriaxone and ciprofloxacin. Also Maximum sensitivity is also seen in Ceftriaxone.

The maximum patients show the Fever and abdominal pain as the main symptoms. Other symptoms includes the chills, headache, constipations, diarrhoea, vomiting, myalgia, cough etc.

Keywords: enteric fever, typhoid fever, Resistance, *S. typhi*, clinical profile

Introduction

The term 'enteric fever' is a collective term that refers to severe typhoid and paratyphoid. Typhoid fever, also known simply as typhoid, is a bacterial infection due to *Salmonella typhi* that causes symptoms [3] which may vary from mild to severe and usually begin six to thirty days after exposure [1, 2]. Often there is a gradual onset of a high fever over several days [1]. Weakness, abdominal pain, constipation, and headaches also commonly occur [2, 6]. Diarrhea is uncommon and vomiting is not usually severe [6]. Some people develop a skin rash with rose colored spots [2]. In severe cases there may be confusion [6]. Without treatment symptoms may last weeks or months [2]. Other people may carry the bacterium without being affected; however, they are still able to spread the disease to others [4]. Typhoid fever is a type of enteric fever along with paratyphoid fever [3].

The cause is the bacterium *Salmonella typhi*, also known as *Salmonella enterica* serotype Typhi, growing in the intestines and blood [2, 6]. Typhoid is spread by eating or drinking food or water contaminated with the feces of an infected person [4]. Risk factors include poor sanitation and poor hygiene [3]. Those who travel to the developing world are also at risk [6], and only humans can be infected [4]. Diagnosis is by either culturing the bacteria or detecting the bacterium's DNA in the blood, stool, or bone marrow [3, 2, 5]. Culturing the bacterium can be difficult [10]. Bone marrow testing is the most accurate [5]. Symptoms are similar to that of many other infectious diseases [6]. Typhus is a different disease [11].

A typhoid vaccine can prevent about 30% to 70% of cases during the first two years [7]. The vaccine may have some effect for up to seven years [3]. It is recommended for those at high risk or people traveling to areas where the disease is common [4]. Other efforts to prevent the disease include

providing clean drinking water, better sanitation, and better hand washing [2, 4]. Until it has been confirmed that an individual's infection is cleared, the individual should not prepare food for others [2]. Treatment of disease is with antibiotics such as azithromycin, fluoroquinolones or third generation cephalosporins [3]. Resistance to these antibiotics has been developing, which has made treatment of the disease more difficult [3].

In 2015 there were 12.5 million new cases worldwide [8]. The disease is most common in India [3]. Children are most commonly affected [3, 4]. Rates of disease decreased in the developed world in the 1940s as a result of improved sanitation and use of antibiotics to treat the disease [4]. Each year in the United States about 400 cases are reported and it is estimated that the disease occurs in about 6,000 people [6, 12]. In 2015 it resulted in about 149,000 deaths worldwide – down from 181,000 in 1990 (about 0.3% of the global total) [9, 13]. The risk of death may be as high as 20% without treatment [4]. With treatment it is between 1 and 4%. [3, 4]. The name typhoid means "resembling typhus" due to the similarity in symptoms [14].

Diagnosis is made by any blood, bone marrow or stool cultures and with the Widal test (demonstration of antibodies against *Salmonella* antigens O-somatic and H-flagellar). In epidemics and less wealthy countries, after excluding malaria, dysentery, or pneumonia, a therapeutic trial time with chloramphenicol is generally undertaken while awaiting the results of the Widal test and cultures of the blood and stool [19].

The Widal test is time-consuming, and prone to significant false positive results. The test may be also falsely negative in the early course of illness. However, unlike Typhidot test Widal test quantifies the specimen with titres.

Typhidot is a medical test consisting of a dot ELISA kit that detects IgM and IgG antibodies against the outer membrane protein (OMP) of the Salmonella typhi. The typhidot test becomes positive within 2–3 days of infection and separately identifies IgM and IgG antibodies. The test is based on the presence of specific IgM and IgG antibodies to a specific 50Kd OMP antigen, which is impregnated on nitrocellulose strips. IgM shows recent infection whereas IgG signifies remote infection. The most important limitation of this test is that it is not quantitative and result is only positive or negative.

Enteric fever is not a notifiable disease throughout India and hence the correct incidence is not known. Limited studies in the country reveal more than 3 lakh cases and more than 650 deaths (approx.) annually [20]. It is a potentially fatal multisystemic illness caused primarily by Salmonella Enterica, subspecies entericaserovars Typhi and, to a lesser extent, related serovarsparatyphi A, B, and C.

This study is planned with the aim to assess the clinical profile in enteric fever.

Methodology

The patients admitted to IPD Of SRMS Institute of Medical Sciences, Bareilly were considered in the study. The approval of the Ethical Committee is taken from the Hospital. The written consent also obtained from the patients. The total 50 were included in the study. The mode of presentation, clinical course, treatment history, laboratory investigations reports, antibiotic administered response to therapy and the complications were recorded.

Following is the inclusion and exclusion criteria for the both study group.

Inclusion criteria

1. Positive blood culture for Salmonella typhi and/ or Salmonella paratyphi organisms.
2. Significant Widal titre
3. A repeat fourfold rise in Widal test titer

Exclusion criteria

1. Patients with respiratory tract infection (tuberculosis, pneumonia)
2. Patients with urinary tract infections
3. Patients with malaria
4. Immunocompromised patients (AIDS)
5. Patients who had already vaccinated with typhoid vaccine.

Results & Discussion

The data from the 50 patient’s enteric fever patients were collected and presented as below.

Table 1: Age of the patients in both study groups

Age in years	Total patients
10-20	11
20-30	7
31-40	15
41-50	9
51-60	8
Total	50

The data in the table 1 indicates the maximum patients of enteric fever are seen in the age group of 31 to 40 years.

Table 2: Male & Female Ratio

Gender	Total patients
Males	32
Females	18
Total	50

Table 2 indicates the ratio of the males and females enrolled in the study.

Table 3: Number of Cases & Symptoms

Symptoms	Number of Cases	Percentage
Fever	45	90
Chills	15	30
Headache	18	36
Constipation	5	10
Diarrhoea	16	32
Abdominal pain	33	66
Vomiting	20	40
Myalgia	7	14
Cough	5	10
Anorexia	6	12

The maximum patients show the Fever and abdominal pain as the main symptoms. Other symptoms includes the chills, headache, constipations, diarrhoea, vomating, myalgia, cough etc.

Table 4: Results of Widal test titer

	Widal test titre	Number of Cases	Percentage
TO	Normal	5	10
	2 fold	3	6
	4 fold (>1:160)	21	42
	8 fold (>1:320)	7	14
TH	Normal	4	8
	2 fold	6	12
	4 fold (>1:160)	22	44
	8 fold (>1:320)	18	36
AH	Normal	18	36
	2 fold	21	42
	4 fold (>1:160)	5	10
	8 fold (>1:320)	15	30

Table 5: Blood Culture & Widal test observation

Blood culture	Widal test			
	Positive		Negative	
	Number of Cases	Percentage	Number of Cases	Percentage
Positive	15	30	5	10
Negative	23	46	1	2
Total	38	76	6	12

Table 6: Antibiotic sensitivity

Antibiotic	Sensitivity %	Resistance %
Amoxicillin	30	70
Chloramphenicol	32	68
Ampicillin	40	60
Cotrimoxazole	41	64
Nalidixic acid	28	72
Ciprofloxacin	75	24
Ceftriaxone	98	3

Maximum resistance for chloramphenicol, amoxicillin, and ampicillin were seen as compared to ceftriaxone and ciprofloxacin. Also Maximum sensitivity is seen with Ceftriaxone.

For the prevention of disease in developing countries like India public education measures should be to encouraged regarding the need for thorough hand washing before eating and preparing/handling foods and sanitary disposal. In the diagnosis of typhoid fever though none of the clinical symptoms and sign have very high accuracy, diagnostic criteria's may be helpful when combined with high index of suspicion and relevant laboratory investigations. Widal test is very commonly used in Indian set up but has variable sensitivity and specificity and therefore has problems in interpretation. As a gold standard blood culture should be done for the definitive diagnosis and proper treatment pertaining to the antibiotic sensitivity and resistance of the isolate. Multidrug resistant typhoid cases, resistant to first line drugs, namely chloramphenicol, cotrimoxazole and ampicillin are reported since 1990. Currently, newer fluoroquinolones and third-generation cephalosporins should be the drugs of choice for the treatment of typhoid fever. Management of typhoid (cloudy) fever continues to pose a challenge, even one hundred years after the microorganism was first isolated by Gaffkey, a German in 1884.

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