

## **Typhoid & paratyphoid fevers in Salahaldin governorate**

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### **Abstract**

From a study of 3167 patients with typhoid & paratyphoid fevers in Salahaldin governorate during years of 1989, 1991 & 1992, the following results were obtained. The outpatients constituted 82.4% of the cases & the admitted patients were 17.6%. More outpatients & less admission in the years 1991 & 1992 were shown; about 48% of the admitted were 15 to 29 years. Female patients were 61.6% especially housewives were 45%. The least affection was observed among the health personnel 2.6%, the incidence of the disease was 58% in the rural areas & the majority of cases was admitted during summer were 40%. The signs & symptoms showed the same known pattern but with less rose spots & hepatomegaly. The diagnosis of the condition was based on the clinical pictures & the results of Widal test. Typhoid fever was found to be predominant (57%) in this study, followed by 38% of mixed infection (typhoid & paratyphoid) & only 5% paratyphoid. Using chloramphenicol together with spetrin in the treatment gave the best response. Although, there was increased incidence of typhoid fever in comparison to the other febrile diseases, the admission of patients was decreased because of the economic sanctions.

### **Introduction**

Enteric fever is an acute systemic disease caused by *S. typhi* & *S. paratyphi* A & B. It is characterized by prolonged fever, headache, abdominal pain, rose spots, & splenomegaly. The patients gain the disease through entrance of the causative agents with the contaminated food or water (1).

The factors that maintain the chains of the infection are derived from the carriers & from his environment, which are most cases not sufficiently controlled so as to eradicate the disease or to reduce its incidence to a minimum (2).

The disease is still very common in some countries in central & south America, Africa, Asia & the South Pacific where sanitary conditions are poor (3,4,5). Rapid & accurate lab. confirmation of suspected cases is obviously vital in order to commence early & appropriate antibiotic therapy & to prevent complication (5). In developing countries, where the disease is common, facilities for isolation & cultures are often not available, especially in smaller hospitals.

The diagnosis rely upon the clinical features of the diseases & detection of significant titer of agglutination antibodies against O and/ or H antigens of *S. typhi*, & *S. paratyphi* by Widal test (2,4,6,7).

The rapid slide widal test is the most widely used procedure in Iraq & other

countries because of the simplicity with which the results may be reported (8,9,10,11). The objective of this study is study is to clarify the clinical & epidemiological aspects of the typhoid & paratyphoid fevers in the area, in order to provide a basis for better management.

### **Patients & Methods**

Records of 3167 patients suffering from typhoid fever in teaching general hospital in Tikrit during the years of 1989, 1991 & 1992 were reviewed. These include 2609 outpatients & 558 in-patients. Records of the admitted patients were studied with regard to age, sex, occupations, area of residence, date of admission & discharge, clinical features, lab. Investigations & treatment. These investigations that were done included: general urine examination, general stool examination, hemoglobin estimation, white blood cells counts, blood film for malaria, widal & brucella test.

Diagnosis of the disease was made on account of history, clinical presentation & the result of Widal test. The test was done by the rapid slide agglutination as described by Matthew et al (12). The result was considered to be positive when both flagellar (H) & osmotic (O) antibody titers were 1:160 or above (11). In most of the cases no culture for blood, urine or stool was done. Annual

reports of the most common infectious diseases in the area were noticed in order to compare their distributions with typhoid fever. Chloramphenicol, ampicillin, septrin were used in treatment of the patients to a total of 14 days

## Results

This study did not include all cases of typhoid & paratyphoid fevers in Salahaldeen governorate during the period of study, since there were other cases were treated in private clinics.

Figure 1 shows the number of typhoid & paratyphoid fever patients (out & in patients) during the years (1989, 1991, 1992). Out of the total number of patients (3167), there were 82.4% (2609) outpatients, & 17.6% (558) inpatients, while, the percent of outpatients for each year was 75.1% (1989), 81% (1991), & 89.2% (1992), & the percent of admission was 24.9% (1989), 19% (1991), & 10.8% (1992).

Table 1 show the age & sex distribution of the admitted patients. Forty eight percent of patients were 15 to 29 years old. Female patients (61.6%) were more affected than male patients (38.4).

The highest percent of the disease was observed among housewives (45.1%), followed by school students (33%), & the lowest among the health personnel's (2.6%). The results revealed more incidences of the diseases in the rural areas (58%). The disease was noticed to be more among population in over crowded areas. Most of the patients were admitted during summer (40%). As shown in figure (2).

The monthly distributions revealed that the peak of infection appeared during June (15.9%), May (13.6%) & October (13.4%). The most clinical symptoms & signs of patients in this study & those from other studies are summarized in Table (2). Fever was observed in all patients, headache, abdominal pain, nausea, vomiting, & splenomegaly appeared in the majority of cases. Less common symptoms were loss of appetite, diarrhea, cough & constipation.

The most common complications recorded in this study among patients was the intestinal hemorrhage as shown as melena (1.7%). The distribution of widal test titers (1:160 & above) given by S. typhi, S.

paratyphi A & S. paratyphi B; of H antigens were : 91.4%, 10%, 7.7% respectively, while, those for O antigens were :75.3%, 20.3%, & 19.4%.

Distribution of the agglutination titers showed that typhoid fever constituted 57% of the total cases. Followed by mixed infection (typhoid & paratyphoid) 38% & paratyphoid fever 5%.

For the treatment of the disease, the combination of chloramphenicol & septrin produced defervescence in 2-4 days, while treatment with chloramphenicol or Ampicillin alone needs 3 -7 days.

The percent of typhoid fever in comparison to other common infectious diseases of children in the area was 2%, while this percent among the common infectious diseases of adults was 14%.

## Discussion

The highest number of patients diagnosed as typhoid fever, few admitted to the hospital in the years 1991, 1992, as compared with the lowest number of the same patients admitted in the year 1989 (fig.1). can be attributed to the fact that the disease is more prevalent in these two latter years due to the lack of sanitary precautions, increasing contaminated water & food, the increased cost of drugs or their shortage, and reduced medical services facilities available in Iraqi hospitals due to the economic sanctions.

The majority of the typhoid & paratyphoid fevers patients were within the age of 15-29 years (young adults) & the disease was less frequent in very young children & in the elderly. These findings are in agreement with those reported by Svenungsson (1982) (13), Al-Haddad (1987) (14), Mohammed (1990) (15). This could be due to more activity of population in this age groups than the others.

The more affection of females in (housewives) is somewhat similar to that recorded in other studies done in Basarah (14) & in Erbil cites (15). This may be due to more contact with source of infection. The high rates of infection among school students are due to lack of sanitary measures in the schools & contact with the causative agents (9).

The health & laboratory personnel's were the least affected ones & this disagrees with Holmes et al (16). The patients contract the disease from rural area more than urban areas in this study indicates the differences in the hygienic standards which seems to be linked with the degree of endemicity of typhoid fever. This confirms the results obtained by earlier reports in Iraq (11), & other countries (2, 4, 17).

In Asia, Africa, South America, the disease is prevalent in urban slums & in rural communities, showing an indigenous trend in the same areas (2,5). Holmes et al (16), told that in endemic areas there is no seasonal preponderance & the disease appears sporadically during the year, however, this study showed increased incidence in May, June & October, & this may be due to more exposure of people to environmental changes which help development of the microorganism.

As far as the clinical symptoms & signs are concerned, the main differences from studies done previously (13, 14,15) was the less incidence of skin rash (rose spots) & hepatomegaly. The rose spots were widely reported among European (13) patients with typhoid fever, but less common in others (14).

Unlike other studies (14,15), intestinal hemorrhage (melenas) was found to be the main complications of the disease in this area (1.7%). The predominance of typhoid fever (57%) followed by mixed infection (typhoid & paratyphoid fever) in this study may explain the severity of the clinical symptoms. The high level of agglutination titer may give an idea about the high endemicity of the disease in the area (9,11, 18). Although, the reliability of widal test in the diagnosis of typhoid fever has been doubted, but still of some benefit as supportive for the clinical diagnosis of typhoid & paratyphoid fevers, especially in developing countries where facilities for culture & isolation of the causative microorganisms are not available, besides time saving (4,7).

On the other hand, numerous studies have shown that widal test, under proper methods of evaluation of agglutinins in normal population remains useful in endemic & non endemic area (2,4,11, 22,23).

Recently, another promising approach to the laboratory diagnosis of typhoid & paratyphoid fevers involves the development of new tests as modified widal (24), ELISA(25), & IFT (26). Rapid defervescence in patients treated with chloroamincol together with septrin may denote development of resistance to the drug (27) alone. Similar result was obtained by Al-Haddad in Basrah (14).

Although, the increased incidence of typhoid fever in comparison to other febrile diseases (i.e brucellosis, meningitis, viral hepatitis), the admission of patients was decreased because of the economic sanctions.

In conclusion, the considerable high incidence of typhoid & paratyphoid fevers in this study indicates that the enteric fever is an important epidemiological problem in Salaheldeen province especially after the war due to faulty & damaged sewage disposal systems which lead to highly contaminated water supplies together with contaminated food as well as increasing the numbers of disease carriers.

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**Table (1):** Shows the age & sex distributions of 558 admitted patients with typhoid fever in Salaheldeen province during 1989,1991, 1992.

| Age groups years | Male patients |         | Female patients |         | Total  |         |
|------------------|---------------|---------|-----------------|---------|--------|---------|
|                  | Number        | Percent | Number          | Percent | Number | Percent |
| <1               | 4             | 40      | 6               | 60      | 10     | 1.8     |
| 1-4              | 7             | 35      | 13              | 65      | 20     | 3.6     |
| 5-9              | 25            | 61      | 16              | 39      | 41     | 7.3     |
| 10-14            | 34            | 39.5    | 52              | 60.5    | 86     | 15.4    |
| 15-19            | 37            | 30.3    | 85              | 69.7    | 122    | 12.8    |
| 20-29            | 48            | 32.9    | 98              | 67.1    | 146    | 26.2    |
| 30-39            | 41            | 51.9    | 38              | 48.1    | 79     | 14.2    |
| 40-49            | 8             | 33.3    | 16              | 66.7    | 24     | 4.3     |
| 50-59            | 2             | 12.5    | 14              | 87.5    | 16     | 2.9     |
| >60              | 8             | 57.1    | 6               | 42.9    | 14     | 2.5     |
| Total            | 214           | 38.4    | 344             | 61.6    | 558    | 100     |

**Table (2):** shows the frequency of clinical symptoms & signs in typhoid fever in various reported series

| Symptoms & signs | 558 patients of present series | Mohammed MM 1990 (15). Number=1410 | Svenungsson 1982 (13). Number 61 |
|------------------|--------------------------------|------------------------------------|----------------------------------|
| Fever            | 100                            | 100                                | 100                              |
| Headache         | 85                             | 90                                 | 51                               |
| Abdominal pain   | 33                             | 75                                 | 39                               |
| Vomiting         | 21                             | 38                                 | 28                               |
| Diarrhea         | 12                             | 22                                 | 75                               |
| Coated tongue    | 10                             | 27                                 | 20                               |
| Cough            | 9                              | 24                                 | 10                               |
| Constipation     | 6                              | 30                                 | 13                               |
| Rose spots       | 2                              | 8                                  | 46                               |
| Hepatomegaly     | 3                              | 10                                 | 16                               |
| Splenomegaly     | 35                             | 80                                 | 8                                |

