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Typhoid: A Record of Cases in Sokoto, Nigeria

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Abstract: In the present study 1694 cases of typhoid in Sokoto of Northern Nigeria, were analyzed based on the examination of monthly medical record at the Usmanu DanFodiyo University Teaching Hospital. The result shows that 531 (31.4%) of the patients were admitted (in patients) while 1162 (68.6%) of the patients were treated for typhoid at the out patient department of the hospital during the study period. Of those admitted, more males (313 or 58.9%) than females (218 or 41.1%) were affected, but sex-related difference in infection rates did not vary significantly ($P>0.05$). The fatality rate (1.5%) was due mainly to intestinal perforation (3.4%) and meningitis (1.2%). Young adults of 11-20 years and adolescents of 21-30 years age grades were the most vulnerable members of the community and disease prevalence rates among them were 36.5 and 31.6%, respectively. Computed F-statistic suggested that there was a uniform yearly increase ($P< 0.05$) in number of cases and this was probably due to improved diagnosis and increased awareness, which enhanced case presentations at the hospital. In a follow-up study, an unstructured interview and questionnaire survey among health workers in local health institutions indicated that the predisposing factors for typhoid in study area were related mainly to personal, food, drinking-water and environmental hygiene and these persisted throughout the months of the study years.

Key words: Typhoid, Nigeria

INTRODUCTION

Typhoid fever is an enteric disease of public health significance in tropical and subtropical areas^[1,2]. It causes problematic enteric and febrile morbidity, which may result in fatal complications^[3,4]. The prevalence of typhoid infection however varies from one community to the other depending on the degree of exposure to the disease^[4,5]. Low standard of food and drinking water hygiene is an important epidemiological factor in many developing countries where typhoid is common^[6,7]. In Nigeria typhoid is a notifiable disease and the main aetiological agents include *Salmonella typhi* and *S. paratyphi*^[6,8]. These non-sporulating and facultative anaerobic bacteria belong to the salmonellae complex^[6,8]. Sporadic out-breaks of typhoid often cause widespread enteritis among urban and rural communities in Nigeria^[6,8,9]. A number of reports have described the distribution of the disease in Southern Nigeria^[8,9]. The extent of the problem in Northern part of the country is however not fully determined^[10,11]. It is against this background that incidence of typhoid in Sokoto is assessed based on medical record of cases at the only teaching hospital located in the state.

MATERIALS AND METHODS

Usmanu DanFodiyo University Teaching Hospital in which the study was carried out is a tertiary referral health center located in Sokoto metropolis. Patients attend the hospital from all over town and the surrounding communities. Data collected for this study is based on a review of the medical records of in patients and out patients treated in the hospital for typhoid fever at the male and female medical wards, the paediatrics ward and the out patient department. The diagnosis of typhoid fever was based on the culture and microscopy of samples from patient's blood, urine or stool^[6,7,9]. Records of widal tests were taken as only strong indication of typhoid and not necessarily a confirmation of infection^[6,7,9]. Cases were then categorized by age, sex and months of the year. Hospital staff that treated patients also answered a preformed questionnaire and/or interview for information on the perceived frequency, impact and general awareness about typhoid in the hospital and among the Sokoto community. F-statistics was computed to test the distribution of typhoid cases over the past years (1985-1989) and the recent years as represented by cases in the years 2001 and 2002.

RESULTS

Pooled distribution pattern: A total of 1694 hospital patients had typhoid between 1985 and 1989 (Table 1). Of this number, 1163 (68.6%) were out patients while 531 (31.4%) were admitted (in patients) for the disease. The result (Table 1) also shows that the number of in patients increased from 49 (9.2%) in 1985 to 206 (38.8%) in 1989. Out patients showed similar increase over the years reviewed. More of males (313 or 58.9%) than females (218 or 41.1%) were affected (Table 2) but the difference did not spread significantly over the various age grades at the 5% level of probability.

Table 1: Typhoid out patients and in patients in study years

	Years					
	1985	1986	1987	1988	1989	Total
	cases	cases	cases	cases	cases	cases
	(%)	(%)	(%)	(%)	(%)	(%)
Patients						
Out patient	107 (68.6)	140 (68.6)	168 (68.6)	297 (68.7)	451 (68.6)	1163 (68.6)
In patient	49 (31.4)	64 (31.4)	77 (31.4)	135 (31.3)	206 (31.4)	531 (31.4)
Total	156 (9.2)	204 (12.1)	245 (14.5)	432 (25.5)	657 (38.8)	1694

Rate (%) of typhoid cases in parentheses

Table 2: Yearly cases of typhoid by sex of in patients

	Years					
	1985	1986	1987	1988	1989	Total
	cases	cases	cases	cases	cases	cases
	(%)	(%)	(%)	(%)	(%)	(%)
Sex						
Male	27 (57.1)	35 (54.7)	42 (54.5)	88 (65.2)	121 (58.2)	313 (58.9)
Female	22 (44.9)	29 (45.3)	35 (45.5)	47 (34.8)	85 (41.3)	218 (41.1)
Both sexes	49 (9.2)	64 (12.1)	77 (14.5)	135 (25.4)	206 (38.8)	531

Figures in bracket are percentages

Table 3: Age-related distribution of typhoid in patients

Age groups (Years)	1985	1986	1987	1988	1989	Total
	cases (%)	cases (%)	cases (%)	cases (%)	cases (%)	cases (%)
0-10	7 (14.3)	8 (12.5)	12 (15.6)	17 (12.6)	22 (10.7)	66 (12.4)
11-20	16 (32.7)	20 (31.3)	26 (33.8)	45 (33.8)	61 (29.6)	168 (31.6)
21-30	17 (34.7)	19 (29.7)	28 (36.4)	43 (31.9)	87 (42.2)	194 (36.5)
31-40	6 (12.2)	17 (26.6)	5 (6.5)	23 (17.0)	28 (13.6)	79 (14.9)
41-50	2 (4.1)	0	5 (6.5)	5 (3.7)	6 (2.9)	18 (3.4)
50+	1 (2.0)	0	7 (1.3)	2 (1.5)	2 (0.97)	6 (1.1)
Total	49 (9.2)	64 (12.1)	77 (14.5)	135 (25.4)	206 (38.8)	531

Figure in bracket are percentages

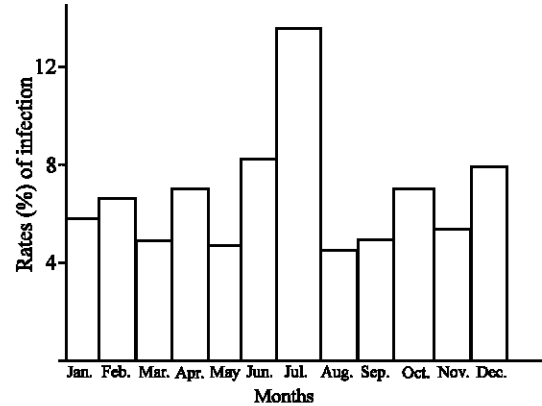


Fig. 1: A Chart of percentage monthly typhoid distribution in Sokoto (1989-1993)

Table 4: Comparison of typhoid cases in past and recent years

	Years						
	1985	1986	1987	1988	1989	2001	2002
	cases	cases	cases	cases	cases	cases	cases
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Patients							
Out patients	107	140	168	297	451	480	492
In patients	49	64	77	135	206	220	226
Total	156	204	245	432	657	700	718
Yi	78	102	122.5	216	328.5	350	359
ni	2						

$\Sigma Y = 3112$; $\Sigma Y^2 = 995910$; $N = 14$; $F_{cal} = 5.52$; $F_{tab} = 5.13$; $P < 0.05$

The result (Table 3) however shows that of the various age grades considered, typhoid was most prevalent (36.5%) among young adults of 21-30 years. This was followed by teen agers of 11-20 years, among whom the rate of typhoid fever was 31.6%. The number of cases generally decreased with age (Table 3). In a follow up review of examination records, it was estimated that the number of in patients admitted for typhoid varied from less than 1.18 to 5.94% of the total admissions for infectious diseases in the hospital during the period under review.

Typhoid intensity: A measure of the intensity of typhoid shows (Table 3) that 66 (12.4%) of in patients were children within the age grade of 10 years and below. The youngest of the children was below the age of three years while the oldest typhoid patient was above 60 years of age. The study however shows no significant variation in the number of monthly cases. Nevertheless, more cases were recorded in the months of July than any other month during the period under review (Fig. 1). There were also slight elevations above the average number of cases in the months of December, June and October (Fig. 1). Computed F-statistic shows (Table 4) that the mean distribution of typhoid cases over the past years of the 1980 and in recent years represented by 2001 and 2002

varied closely ($P < 0.05$) which suggested a consistent increase in number of typhoid cases and the persistence of predisposing factors in study area over the years.

Overall typhoid mortality was 1.5% and this was due mainly to intestinal perforation (3.4%). Other typhoid complications include meningitis (1.2%) and psychosis (1.1%). Most cases (94%) of typhoid observed however presented as febrile illness commonly misdiagnosed and treated as malaria, which is co-endemic.

Predisposing factors: It was observed in this study that drinking water was most likely a main source of typhoid among affected patients and this was irrespective of the source. A review of response to questionnaire shows that patients got their drinking water from many sources including pipe borne system (for residents of Sokoto town), stream, rivers, tube-wells, pools, domestic storage containers and water hawkers (for Sokoto town and suburbs). Patients from the suburbs had no access to pipe water back at home, and so derived water from the shallow surface sources that were also used by grazing livestock. Other likely sources of typhoid include food and meat (local barbecue) sold to the public by vendors and at roadside stalls or kiosks. During festive periods or any social occasions the hawkers and the stands for food, meat and water enjoyed extra public patronage. Packaged water and tasty mineral drinks, which were sold in cellophane bags of 30-50 ml, were particularly popular during the months (April, May and June) of extreme heat (hot weather). Persons who dispensed items had little or no knowledge of hygiene or infectious diseases. Another likely source of the disease was domestic animals. These were maintained in many homes as pets or livestock such as dogs, cats, sheep, goats, cattle etc. Wastes from these animals commonly accumulate in close proximity with the animal keepers. Occasionally these wastes as well as heaps of refuse or broken sewage locate by leaking water-pipe or surface water system that supply the public. An observed feature of typhoid epidemiology in study area was the widespread use of antibiotics especially chloramphenicol. Resident health workers, in an unstructured interview complained that many patients took these drugs without proper medical consultations. The drugs were easily purchased from patent medicine stores that were operated mainly by quacks.

DISCUSSION

The present study suggested the typhoid prevalent in Sokoto. The result also compares closely with typhoid distribution in other parts of Nigeria where the disease affects both sexes almost equally with a predilection for the young^[6,7,9].

Indeed it appears that typhoid in Sokoto is a disease of adolescence because most patients were young adults or in the teenage group. This is probably because members of these groups were more likely to eat and/or drink freely from public and unprotected sources. On the other hand, it is possible that the disease decreased with age because of immunity derived from prolonged infections^[10,11] or because older persons have a more restricted eating and drinking habit. Other observations made in this study suggest, that exposure to typhoid in Sokoto compares with the problem in other parts of Nigeria^[8,9] and developing tropical countries where the disease is endemic^[3,4]. Typhoid in these areas has been associated with ignorance, low standard of personal hygiene and in-sanitary environment by which food and drinking water are easily polluted^[4,12,13]. This report is also in agreement with other studies, which show that food handlers^[10,11] and domestic animals^[1,2] are important reservoirs of human typhoid. Actually it has been reported that public pipe-water supply in particular is an important factor of typhoid outbreaks in many parts of Nigeria^[12,13]. Since cases of the disease were recorded throughout the months under review it means that transmission factors persists in Sokoto throughout the year, as confirmed by computed statistics. The increase in number of patients in July (Fig. 1) is consistent with other findings^[10,11], which show that this coincided with the onset of the wet season in nearby Northern Nigeria town of Zaria and Kaduna. The yearly increase of patients may be attributable to the improvement in modern diagnostic possibilities that have aided general public awareness, leading to more case presentation at the hospital. The indiscriminate use of antibiotics for self-medication probably constitutes a factor of typhoid resistance in Sokoto as it is with the case in other parts of Nigeria^[6,10]. An indication of the severity of this problem in study area may be deduced from the fact that for every patient admitted to the hospital for typhoid in Sokoto, two or more others were treated as out-patients and perhaps twice more of that number use self-medication back at home. This underscores the need for the control of typhoid in study area especially through public health education. This report may also be considered as significant because typhoid has been used as an index of low standard of living in inner cities of many countries of the world where the disease is endemic^[3,4,11]. Typhoid control in Sokoto is all the more desirable because avoidable typhoid intestinal perforation, the unreliable surgical remedy of this symptom, typhoid septicaemia and other complications are common and have increased mortality among communities where sanitation and living standard are poor^[13,14].

Typhoid is a common febrile infection in study area. The severe disease has poor prognosis because of co-endemicity with malaria. Poor personal hygiene is however an important predisposing factor of typhoid among affected individuals. Most cases are asymptomatic because of prevailing acquired immunity. Consequently, only a comparatively few clinical cases report at the hospitals but this has increased in recent years because of improved awareness and diagnostic possibilities. Public health education campaign is therefore advocated as a necessary measure to control the disease and prevent undue epidemics.

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