

The Pattern of Typhoid Psychosis in Childhood at the University of Port Harcourt Teaching Hospital Port Harcourt January 2000-December 2003

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Abstract: This was a 4-year (200-2003) hospital based Prevalence study of Typhoid Psychosis in childhood. In this study, of the total number of 1645 neuropsychiatric patient, 411 were aged 0-19 years of age. Out of which males were 176 (42.8%) and females were 235 (57.2%). Seventeen met the criteria for typhoid psychosis, males 5 (29.41%) and females 12 (70.6%) which was based on a rising widal titre/significant titre rise. The prevalence rate was 4.14 with a male female ratio, M: F of 1:2.4. The mean age was 17 years. Adolescents mainly females who were from a low socio-economic class were over represented in this study. The prominent clinical features included, high grade fever, insomnia headache, visual hallucination and dehydration. Less common ones included, delusion, confusion, restlessness, convulsion and apathy. Typhoid Psychosis in Childhood becomes less fatal with early and adequate medical intervention.

Key words: Typhoid psychosis, childhood, clinical presentation, diagnosis, early intervention, outcome

INTRODUCTION

Typhoid fever is an acute systemic life threatening febrile illness caused by the bacterium salmonella enterica typhi and para typhi. It usually presents in children and young adults (Huckstep, 1962; Hofman *et al.*, 1984; Bhutta, 1996).

The incubation period varies from three to thirty days and depends upon the inoculum size and host defense (Hornic *et al.*, 1970). It presents classically with fever (Hornic *et al.*, 1970) which may be associated with chills headache anorexia nausea sweating poorly localized abdominal discomfort, and myalgia but with few physical signs (Bhutta, 1996; Butler *et al.*, 1991). A coated tongue, rose spots on the trunk (rarely seen in blacks), tender abdomen hepatomegaly, splenomegaly and a relative bradycardia are common. Convulsion may occur in children under five years of age (Butler *et al.*, 1991). A typical presentation of typhoid fever are acute psychosis and confusion, usually, occurring in 5-10% of Patients (Hornic *et al.*, 1970; Peasson and Guerrant, 1995). Many complications arising from poorly treated typhoid fever of which gastrointestinal bleeding; intestinal perforation (Bitar and Tarpley, 1985; Van Basters and Stockenbrugger, 1960) and typhoid encephalopathy (Hoffman *et al.*, 1984; Punjabi *et al.*, 1988; Rogerson *et al.*,

1991) are the most important carrying high morbidity and mortality (Hornic *et al.*, 1970). Acute psychosis resulting from infection by salmonella typhi referred to as Typhoid psychosis is uncommon in children but its antecedent complications with high morbidity and mortality if poorly managed generates a lot of anxieties to parents (Samantray *et al.*, 1977). These anxieties are worsened by the facts that the psychotic features manifested few days after an onset of low grade remittent fever in otherwise a previously healthy and normal child; and also the thought of consulting a neuropsychiatrist especially in our socio-cultural setting where it connotes madness (Stanley and Ideriah, 2004).

The incidence of these neuropsychiatric features varies among countries though the geographical variation is unexplained (Hoffman *et al.*, 1984; Punjabi *et al.* 1988). While several works have been done to determine the incidence and prevalence of typhoid psychosis in Indonesia (Hoffman *et al.*, 1984; Punjabi *et al.*, 1988) Papua New Guinea (Rogerson *et al.* 1991) Pakistan (Bhutta 1996) and Vietnam (Hoa *et al.*, 1998) quite a little has been done in this area in Nigeria.

The paucity of similar studies has prompted this study with the aim of determining the prevalence of typhoid psychosis among children seen in a Nigeria tertiary health institution with a view to obtaining a base

line data that will give a focus for more stimulating studies in this area including broad based prevalence studies pattern of morbidity and mortality and treatment modalities.

MATERIALS AND METHODS

This was a hospital-based study. The setting was University of Port Harcourt Teaching Hospital; Port Harcourt, Nigeria situated in Niger Delta region of Nigeria and is a major referral center for a population of about 2.5 million (Federal Ministry of Health Nigeria, National Reproductive Health Strategies, 2002) and other neighbouring states of south-south region of Nigeria.

All subjects of ages 0-14 years seen at the psychiatric out patient clinic and casualty departments of University of Port Harcourt Teaching Hospital between January 2000 and December 2003 were studied.

Full case histories were taken and details of mental and physical examinations were performed by one of the authors (SPC) on every patient within 24 h of arrival at the hospital. Socio demographic and clinical data were recorded in a specially designed data collection form.

The diagnosis was based on the DSM IV (American Psychiatric Association, 1994) the clinical judgment of the authors as well as the routine presumptive serological test (widal test) that comprised widal tests from a paired sera (acute and convalescence). A significant rising titre and/or a single significant increase in titre of a widal reaction on a serum during an acute illness together with compatible features have been the adopted option in making a diagnosis of typhoid fever in most clinics/hospitals in an endemic area of typhoid/paratyphoid fevers of a developing nation like Nigeria (Tanyigna *et al.*, 1999, 2001). This is usually after the baseline titre in a community has been determined. The reason being that patients in convalescent stages of their illnesses in this part of the world hardly present to the hospitals (Tanyigna *et al.*, 1999).

Data analysis was performed using counting and frequency tables.

Treatment principles

These included:

- Antibiotic therapy the antibiotic of choice was Amoxycilline.
 - Intravenously 500mg 6 hourly for 48 h then
 - Cap amoxycilline 500 mg 6hourly $\times 2/52$

- Rehydration with 5% Dextrose/Saline 1L 8hourly for 48 h
- Sedation.
 - Parenteral drugs: I.M chlorpromazine 100-150mg 12 hourly $\times 48$ h
 - I.V Diazepam 10-20mg b.d $\times 48$ h
 - Oral drugs-antipsychotics: These are usually commenced as soon as the patient is fairly calm.
- Treatment of malaria- if Malaria Parasite is positive
- Psychotherapy.
- Nutritional supplementation.

RESULTS

During the 4 years period of study, there were a total of 1645 Neuropsychiatric patients seen in the psychiatric and Emergency unit of the hospital.

Patients aged 0-19 years were 411; male 176 (42.8%) and females 235 (57.2%). Out of these, 17 subjects, 5 (29.41) males and 12 (70.59%) females met the criteria for Typhoid Psychosis giving a hospital based prevalence of 4.14 and a M:F 1:2.4.

The age range was from 13-19 years in a mean age of 17 years. All subjects (males and females) except a female were aged 15-19 years. The distribution of subjects with Typhoid Psychosis according to age and sex is as shown in Table 1: There was a significant difference in age, sex and educational distribution. There was also a significant difference within the study group on the occupational statuses of their parents.

DISCUSSION

In this study, the prevalence of typhoid psychosis was 4.14%. This is less than the figure reported in most of the other studies (Hoffman *et al.*, 1984; Huckstep, 1962; Ramachandran *et al.*, 1975). Adolescents mainly junior secondary school females from a low social-economic background were over represented in this study (Table 1-3). This group of children were now probably spending more time, outside home due to longer h in school and may thus have need to patronize food vendors to satisfy their hunger. Unfortunately, the state of hygiene of the cooking environment, the water supply and the vendors themselves that operate in public schools may not be satisfactory. Traditionally, female adolescents are more adventurous with food and making friends that the males who spend their energy on football and other

Table 1: Distribution of subjects with typhoid psychosis according to age and sex

Age (years)	Male (%)	Female (%)	P-value
0-4	0	0	
5-9	0	0	
10-14	0	1	< 0.05
15-19	5	11	< 0.05
Total	5 %	12	

Table 2: Educational status of subjects

Educational status	Male (%)	Female (%)	p-value
Primary	0	0	> 0.05
Post-primary	4 (80)	11 (91.66)	< 0.05
Higher institution	1 (20)	1 (8.33)	> 0.05
Total	5 (100)	16 (100)	

Table 3: Occupation of parents /family relations with typhoid psychosis

Class	N	%	P-value
I. Professionals and executive (Doctor)	1	5.90	
II. Skilled labour	9	52.90	
III. Semi-skilled labour	5	29.40	< 0.05
IV. Unskilled labour	2	11.80	
Total	17	100 %	

Table 4: Pattern of clinical features on presentation

Clinical symptoms and signs	Number	(%)
Fever T=38°C	17	100
Moderate server - dehydration	17	100
Visual hallucination	17	100
Delusion	5	29.41
Insomnia	17	100
Headache	17	100
Confusion	7	41.18
Amnesia	10	50.3
Restlessness	8	47.06
Apathetic /mutism	7	41.18
Convulsion	1	5.88
Coma	0	0
Moderate to severe dehydration	17	100

N/B: No mortality was recorded in the study

sports during break time. This could explain the higher incidence of infection among the females. The higher prevalence of infection among children from poor socio-economic background agrees with the work of Hoffman *et al.* (1984). They had reported that *Solmonella typhi* infection was more prevalent among the poor and developing nations of the world to which Nigeria belongs. The clinical features frequently documented in this study included visual hallucination insomnia, headaches and pyrexia ($\geq 38^{\circ}\text{C}$), while delusions apathy/mutism, confusion restlessness and amnesia were moderately seen (Table 4). Convulsion was infrequent, coma and ataxia were not observed. Convulsion and unconsciousness were not reported in our study. This agrees with the findings of Butler *et al.* (1991) who reported that these features were rare in children above 5 years of age. The lower prevalence in our study of the absence of severe neurological findings could be attributable to an early diagnosis with a high index of suspicion. Neuro-psychiatric complications in typhoid fever are not

uncommon and the prevalence ranges from 5 to 35% in various studies (Bhutta, 1996; Bitar and Tarpley, 1985; Ramachandran *et al.*, 1975). Of these typhoid encephalopathy or acute organic psychosis is the most common (9.6-57%) followed by meningismus (5-17%) (Ramachandran *et al.* 1975; Rogerson *et al.*, 1991). Others include convulsions (1.7-40%), meningitis (0.2%) focal neurological deficits (0.5%) and cerebellar ataxia (52%) and aphasia (2-7.4%) (Ramachandran *et al.*, 1975; Rogerson *et al.*, 1991; Tanyigna *et al.*, 2001).

Most of the neurological complications described were seen during the course of illness at the height of fever or during defervescence. Some occurred during convalescence like neuropathy amnesia and psychosis (Ramachandran *et al.*, 1975; Samantray *et al.*, 1977). In this study, the neurological deficits occurred a few days after the onset of fever in the course of the illness. This agrees with the report of Mukhyaprana *et al.*, 2004; Singh and Gupta (1993). The mechanism responsible for the neurological manifestations of typhoid fever have been variously described. Possible mechanisms implicated are hyperpyrexia ($>39^{\circ}\text{C}$), fluid and electrolyte disturbances typhoid neurotoxin vasculitis with perivascular cuffing autoimmune mechanism pressure effect on blood vessels resulting in cerebral infarction and acute disseminated encephalomyelitis (Ramachandran *et al.*, 1975; Samantray *et al.*, 1977; Wadia, 1985). In our study, we did neither Cerebrospinal Fluid analysis (CSF) nor Computed Tomographic (CT) scan studies. However, previous reports have documented that their findings are usually not rewarding (Ramachandran *et al.*, 1975; Samantray *et al.*, 1977). Motor aphasia have been frequently reported previously (Stuart and Pullen, 1946; Tanyigna *et al.*, 1999) and recently conduction aphasia with parietal lobe dysfunction (Singh and Gupta, 1993). In our study, we could not establish any form of aphasia, rather, we reported apathy/mutism, since we could not establish whether their inability to respond verbally was due to motor or comprehension aphasia. However, among the patients who presented with mutism, onset was sudden and full recovery occurred within 5 days after commencement of treatment. Our findings of hyperpyrexia dehydration, confusion and high and rising titres of salmonella typhi antigens agree with other reports on the possible mechanisms that produce neuro-psychiatric manifestations (Samantray *et al.*, 1977; Wadia, 1985). Dehydration obviously results from profuse sweating and refusal of food and drinks. Hundred percent of our patients had neither taken meals nor fluids 24-48 h prior to presentation. This is a common pattern in acute psychotic illnesses when the patients become grossly delusional and uncooperative. In this situation, adequate

rehydration through intravenous fluids becomes necessary to restore the fluids and electrolyte balance and improve circulation. The prognosis of neuropsychiatric deficits in enteric fever is usually good with an early intervention. In most of the cases the recovery is slow and complete, but in some the deficits may persist for long (Ramachandran *et al.*, 1975; Wadia, 1985). Our patients showed rapid and dramatic recovery following treatment with antibiotics, intravenous fluids and anti-psychotic therapies. On a follow up visit 1 month after discharge without medications, there was no identifiable symptom nor sign. Urgent intervention measures following an early diagnosis show an excellent prognostic outcome.

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