

Pattern and Outcome of Admissions in the Children's Emergency Room of the University of Nigeria Teaching Hospital, Enugu

SN Ibeziako*, RC Ibekwe**

Summary

Ibeziako SN, Ibekwe RC. Pattern and Outcome of Admissions in the Children's Emergency Room of the University of Nigeria Teaching Hospital, Enugu. *Nigerian Journal of Paediatrics* 2002; 29: 103. A five-year review of the pattern and outcome of paediatric admissions in the Children Emergency Room (CHER) of the University of Nigeria Teaching Hospital (UNTH) Enugu, showed a total of 10,267 admissions, a discharge rate of 50.4 percent, a transfer-out rate of 44.3 percent, and a mortality of 5.1 percent. The commonest causes of admission were febrile convulsions (21.5 percent), severe malaria with anaemic heart failure (18.4 percent), acute lower respiratory tract infections (ALRTI) in 16.1 percent, diarrhoeal diseases (12.3 percent), complications of sickle cell anaemia (7.6 percent), acute neurological conditions (7.6 percent), acute asthma (5.2 percent) and neonatal conditions (4.8 percent). Surgical emergencies constituted 6.1 percent of all admissions while chronic medical conditions were only 0.4 percent. Among those that died, neonatal deaths involving mainly out-born babies accounted for 10.4 percent, while the leading causes of mortality beyond the neonatal period were severe malaria with severe anaemia in 30.0 percent, ALRTI in 19.3 percent and severe dehydration with shock in 10.9 percent. The majority of deaths (73.5 percent) in children under five years of age occurred in those aged two years and below with a peak in the age group, 7- 12 months. The vulnerability of our children to communicable but preventable diseases is highlighted. The provision of Children's Emergency Units is recommended where they do not exist. A cleaner environment, sustained health education and disease surveillance among the under-five for early detection of ill health and appropriate intervention will most likely reduce the burden of paediatric emergencies. At the appropriate level of care, facilities to ensure prompt response by blood transfusion services should be ensured.

Introduction

A key service area in tertiary health institutions is the Children's Emergency Room (CHER), where paediatric emergencies are promptly dealt with, on a 24-hour basis. It represents a high-volume, high-stress service area. Despite the limitations of hospital-based data, the concept of performance evaluation in hospitals is well known. This includes retrospective and prospective reviews with analysis of clinical performance, at regular intervals. The information obtained from such reviews

is usually beneficial in re-evaluating existing services, improving facilities and identifying aspects of care that can be improved. Except for the weekly departmental mortality meetings, there has been no comprehensive review of performance in this key area in the University of Nigeria Teaching Hospital (UNTH), Enugu. Although reports¹⁻³ on the pattern of childhood morbidities and mortalities are available from some centres, only a few⁴⁻⁷ have highlighted the pattern of paediatric emergencies. This paper, which describes the clinical performance in CHER-UNTH with respect to the pattern and outcome of admissions, was undertaken to determine the impact and effectiveness of CHER on paediatric emergencies. It is hoped that the information obtained will provide a basis for future evaluation of the unit as well as data for comparison with similar reports from elsewhere.

University of Nigeria Teaching Hospital, Enugu

Department of Paediatrics

* Lecturer/Consultant

**Senior Registrar

Correspondence: SN Ibeziako

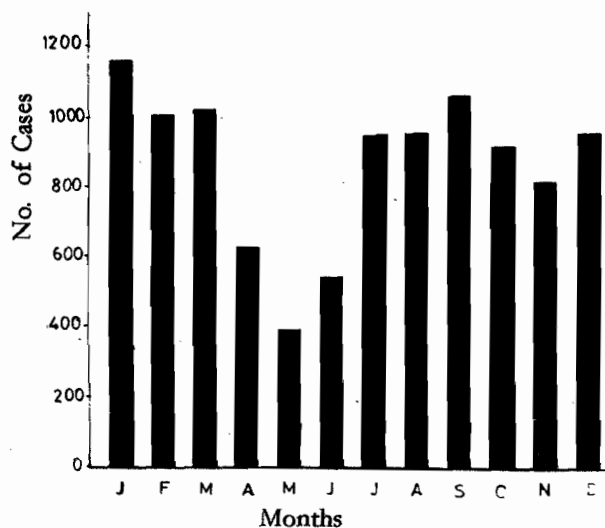


Fig. 1. Average monthly admissions in CHER over a five-year period

Subjects and Methods

The case records of children admitted into CHER-UNTH, between January 1992 and December 1996, were reviewed. Data extracted from the records include age, sex, diagnosis, outcome, and duration of hospitalization. Outcome is classified as discharge, transfer to the main paediatric wards, discharge against medical advice and death. The Children's Emergency Room in UNTH is a complex of a general ward, isolation ward, Diarrhoea Training Unit and Medical Records Unit. Full laboratory, blood transfusion and radiological services of the hospital are available to the Unit on a 24-hour basis. CHER is non-discriminatory, receiving patients who may be referred from other hospitals or are self referred from their homes, as well as from the Children's Outpatient Department of UNTH.

Statistical analysis of data was by the Student's 't' test, using EPI-INFO statistical package, Version 6.

Results

A total of 10,267 patients whose ages ranged from birth to 18 years (mean 37.9 months) were admitted into the Emergency Room during the five-year period under review. They were made up of 6022 males and 4245 females (M:F=1.4:1). The cumulative monthly admission (Fig.1) shows that admissions were highest

in January and September. These correspond to the peaks of the hot dry and wet seasons, respectively.

Morbidity

The causes of admission are shown in Table I. Life-threatening medical emergencies constituted 93.5 percent of all presentations while surgical emergencies represented 6.1 percent. The rest (0.4 percent) were cold cases. The commonest medical emergencies were febrile convulsion, anaemic heart failure from severe malaria, sickle cell anaemia or other causes, severe respiratory tract infections, bronchial asthma, and diarrhoeal diseases. Others were acute onset neurological disorders with loss of consciousness due mainly to cerebral malaria and meningitis. The neonates seen in CHER were referred either from other government or mission owned secondary health facilities, private hospitals, clinics and maternity homes or were self-referred. The major indications for these referrals were severe birth asphyxia, severe neonatal jaundice, prematurity and neonatal sepsis; others were congenital abnormalities. The commonest surgical emergency was intussusception. Childhood malignancies accounted for the 'cold' cases that were either relapses or new cases.

Outcome

Table II shows that 5,175 patients (50.4 percent) were discharged home while 4,548 (44.3 percent) were transferred out of CHER to the main paediatric wards. Both accounted for 94.7 percent of total admissions. Five hundred and twenty eight patients (5.14 percent), made up of 266 males and 262 females, died; there was no significant difference between the sexes ($t=0.275$, $df=2$, $p>0.05$). Eleven children (0.1 percent) were taken away against medical advice, and five patients (0.05 percent) absconded while waiting to replace blood obtained on loan, or to settle hospital fees. Refusal of blood transfusion by parents belonging to the Jehovah Witness sect was responsible for most of the discharges against medical advice.

Mortality

The age and sex distribution of the 528 patients that died is shown in Table III, while Table IV shows the principal causes of death. Overall, the three commonest causes were severe malaria with anaemia in 30 percent, ALRTI in 19.3 percent, and severe dehydration and shock due to gastro-enteritis in 10.9 percent. Others were sepsis in 8.9 percent, complications of sickle cell anaemia in 7.6 percent, acute neurological conditions in 7.4 percent and neonatal deaths in 10.4 percent. Two

Table I

Major Causes of Admission in 10,267 Patients

Condition	No of Patients	Percent of Total
Febrile convulsions	2207	21.5
Severe malaria with anaemic heart failure	1653	16.1
Diarrhoeal disease	1263	12.3
Sickle cell anaemia	780	7.6
Acute neurological conditions	780	7.6
Acute asthma	534	5.2
Neonatal conditions	493	4.8
Surgical conditions	627	6.1
Chronic medical conditions: (Leukaemia, childhood neoplasm and severe kwashiorkor)	41	0.4
Total	10267	100.00

Table II

Outcome in 10,267 Paediatric Emergencies

Outcome	No. of Patients	Percent of Total
Discharged	5175	50.4
Transferred out	4548	44.3
Died	528	5.14
DAMA*	11	0.11
Absconded	5	0.05
Total	10267	100.00

*DAMA = Discharged against medical advice

hundred and eighty one (53.2 percent) deaths occurred in the first year of life. Although a peak mortality of 26.5 percent occurred among children aged between seven and 12 months, it was not statistically significant ($t=1.696$, $df=2$, $p=0.232$). Under-five mortality was 87.7 percent while those two years of age and below accounted for 73.5 percent mortality ($t=4.116$, $df=12$, $p=0.0014$). Children older than five years accounted for 12.3 percent mortality with sickle cell anaemia and its complications being the cause of death in over 50.0 percent. Further analysis of age related causes of death revealed the following:

Neonatal period

Fifty-five neonatal deaths occurred in babies delivered outside UNTH. All were severely compromised. Neonatal sepsis (45.4 percent), severe birth asphyxia (10.9 percent), neonatal jaundice either as a result of kernicterus, sepsis or a combination of both factors (7.2 percent) and varying degrees of prematurity (5.4 percent) were the leading causes of death. Less common causes included anaemia of undetermined origin in 9.1 percent, and multiple congenital abnormalities in 3.6 percent.

Infancy

Eighty-six children aged 1-6 months, died. Acute lower respiratory tract infection and diarrhoeal diseases in 33.0 percent each and severe anaemia, probably as a result of malaria in 11.0 percent were the major causes of death. Diagnosis of sepsis with DIC was entertained in 7.6 percent. Among 140 children in the 7-12 months age bracket, severe malaria with anaemic heart failure (41.6 percent), gastroenteritis (18.4 percent), bronchopneumonia (16.8 percent) and sepsis (7.2 percent) were responsible for death in 118. Other causes were sickle cell anaemia and meningitis.

Table III

Age and Sex Distribution among 528 Deaths

Age	Total No. of Patients	M	F	Percent of Total
0-28 days	55	31	24	10.4
1-6 months	86	46	40	16.3
7-12 months	140	75	65	26.5
>1-2 years	107	49	58	20.2
>2-5 years	75	37	38	14.3
>5 years	65	23	42	12.3
Total	528	261	267	100.0

Table IV

Major Causes of Mortality in 528 Patients

<i>Diagnosis</i>	<i>No. of Deaths</i>	<i>Percent Mortality</i>	<i>Percent of Total Admissions</i>
Severe malaria	158	30.0	1.54
ALRTI	102	19.3	0.99
Diarrhoeal disease	58	10.9	0.56
Sepsis	47	8.9	0.46
SCA & complications	40	7.6	0.40
ANC	39	7.4	0.38
Neonatal deaths	55	10.4	0.53
Miscellaneous	29	5.5	0.28
Total	528	100.0	5.14

ALRTI = Acute lower respiratory infections

SCA = Sick cell anaemia

ANC = Acute neurological conditions (including cerebral malaria and meningitis)

>1-2 years

One hundred and seven deaths (20.2 percent) occurred in this age group and represented the second highest mortality grouping. Severe malaria with severe anaemia was the leading cause of death in 42 percent, broncho-pneumonia in 16.8 percent and encephalopathy in 15.8 percent. Definite diagnosis of cerebral malaria and meningitis were made in 6.5 percent and 5.6 percent, respectively out of those with encephalopathy. Severe protein energy malnutrition (PEM), biliary atresia, prune-belly syndrome, toxic encephalopathy, sickle cell anaemia, measles and aspiration pneumonitis were infrequent causes in the remaining 13.0 percent.

>2-5 years

Fourteen percent of all deaths occurred in children aged 2-5 years. Anaemic heart failure, either as an entity, or in combination with other causes in 34.6 percent, ALRTI in 14.6 percent, sickle cell anaemia related conditions in 10.6 percent, and encephalopathy in 6.6 percent were the major causes of death. The remainder were due to hepatic encephalopathy, infected V-P shunt, acute glomerulonephritis, acute severe asthma, typhoid perforation, meningitis and PEM.

>5 years

Sickle cell anaemia and related complications were responsible for 61.5 percent of mortality in the older children. Others were severe malaria complicated by

severe anaemia in 24.4 percent, and sepsis in 14.2 percent.

Discussion

The findings in this review have shown the major causes of admission and the leading causes of mortality in CHER-UNTH Enugu, to be infection related. When compared with reports from other centres,¹⁻⁷ the findings seem to suggest that the pattern of childhood morbidity and mortality among Nigerian children has, more or less, remained unchanged in the last two decades. The World Health Organization (WHO) and UNICEF recognize severe anaemia (both infection related and nutritional), ALRTI and diarrhoeal disease as major causes of under-five morbidity and mortality, either as a single entity or in combination with other causes.⁸⁻¹¹ This was confirmed in this study. It is worthy to note that these are preventable diseases and it is likely that an interplay of poor environmental and low socio-economic conditions have contributed to their persistence as causes of morbidity and death.

The outcome of admissions with regard to discharges and transfers-out is encouraging and justifies the existence of the Unit. However, adequate resources should be put in place for improved outcome especially during the identified peaks of admission since the apparently low mortality may represent the tip of the iceberg. One such resource to be ensured should be a rapid response to blood transfusion requests. All the neonates that died were outborn and the major causes of morbidity and death were largely preventable and

amenable to treatment. The situation is a reflection of the poor quality of antenatal and neonatal care outside tertiary health institutions. Antia-Obong,⁷ and Iloeje¹² have suggested that late presentation in hospital may be responsible for the high mortality among our children. In this review, we were unable to determine the contribution of 'delay' and the duration of hospitalisation to mortality as a result of incomplete entries. It would however, seem that most complications of childhood illnesses arise from delay in seeking medical attention. Health-care providers outside the tertiary health facilities should be made to undergo regular updates on maternal and newborn health as recommended by WHO.¹³ This will enable them recognize and refer very ill babies requiring expert attention.

The vulnerability of the under-five in general, and of those under two years in particular, to communicable diseases is highlighted. The peak mortality between seven and 12 months recorded in this review has been reported from Ilorin,² Sierra-Leone⁵ and Calabar.⁷ Severe malaria with severe anaemia was the commonest cause of death in all ages beyond the neonatal period. Menendez *et al.*¹⁴ recently confirmed the role of malaria as the largest contributor to the aetiology of severe anaemia in infants in highly endemic areas. Early and appropriate treatment of malaria, coupled with strategies to reduce its transmission, will reduce the burden of the scourge on children. Death due to sickle cell anaemia was highest in older children above five years of age. The practice of increased daily oral fluid intake to prevent intra-erythrocytic dehydration and the liberal use of foods and vegetables rich in anti-oxidants as reported by Sess *et al.*¹⁵ as adjuvants to the current use of malaria prophylaxis, may reduce the frequency of morbidity in children with sickle cell haemoglobinopathy. Most importantly, prospective counselling to reduce the prevalence of sickle cell anaemia in the long term should be vigorously promoted among children and young people. Continued health education, the promotion of child survival strategies especially at the household level, if combined with a general improvement in the socio-economic circumstances of the populace, may further reduce mortality.

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