International Journal of Biomedical Research
ISSN: 0976-9633 (Online); 2455-0566 (Print)
Journal DOI: https://doi.org/10.7439/ijbr
CODEN: IJBRFA

Original Research Article

Pattern of childhood morbidity and outcome of childhood admission in Imo state University Teaching Hospital Orlu Imo state: A 3year review

Kenneth Nchekwube Okeke[1], Joseph Ezeogu[2], Sylvia Tochukwu Echendu[3], Godfrey Ikechukwu Eberendu[4], Jude C Okoro[4], George O Emechebe[5], Chisom Adaobi Nri-Ezedi[1], C C Ifezulike[5], Stephen Emeka Edokwe[1], Ezinne Ifeyinwa Nwaneli[1], Victoria Nkiru Agu[3], Esther Ngozi Umeadi[1], Thomas Obiajulu Ulasi[1], Amalachukwu Okwukweka Odita[1]

[1]*Department of Paediatrics, Nnamdi Azikiwe University, Awka*
[2]*Imo State University Teaching Hospital Orlu*
[3]*Department of Paediatrics, Nnamdi Azikiwe University Teaching Hospital Nnewi*
[4]*Department of Paediatrics, Imo State University Teaching Hospital Orlu*
[5]*Department of Paediatrics, Chukwuemeka Odumegwu Ojukwu University Awka*

Abstract

Background: Despite several strategies put in place to reduce childhood morbidity and mortality, the mortality rate still remains high in developing countries with only marginal reduction achieved over the past decades. It is therefore important to periodically review the morbidity pattern and outcome of childhood hospital admissions so as to compare the progress achieved over time. This will also bring to the fore, the need to strengthen the already existing childhood survival strategy or to determine if there are needs for newer interventions.
Objectives: The aim of the study was to review the morbidity pattern and outcome of childhood admissions in Imo State University Teaching Hospital, South East Nigeria.
Materials and methods: This was both a retrospective and descriptive study. The admission and discharge records between 2010 and 2013 were reviewed. The age, sex, diagnosis and duration of hospital stay were retrieved from the patients' records.
Results: A total of 1271 cases were analyzed, 765 (60.2%) male and 506 (39.8%) with a male: female ratio of 1.5:1. Approximately 72% of the cases studied were children ≤5 years. The mean age of boys and girls were 3.77±4.88years and 3.80±4.79 years respectively. Malaria (22.3%), gastroenteritis (8.6%), pneumonia (8.5%) and sepsis (7.6%) were the commonest causes of paediatric admissions while 3.5% of the patients reviewed had unspecified diseases. About 83.4% of the patients were discharged while about 9% of the patients died.
Conclusions: Childhood morbidity and mortality in Imo state university is still high with majority of admissions occurring in children ≤5years. About 46% of the cases seen were due to preventable diseases - malaria, gastroenteritis, pneumonia and sepsis. Majority of these hospital admissions occur in the under –five children. Efforts should be intensified to step up implementation of strategies that will improve childhood survival. Education of caregivers, early presentation to the hospital, prompt diagnosis and proper management of these patients should be encouraged.
Keywords: Morbidity, Mortality, Pattern, Outcome.

***Correspondence Info:**
Dr. Sylvia Tochukwu Echendu
Consultant Paediatrician
Nnamdi Azikiwe University Teaching Hospital, Nnewi.
Email: sylvianpc2015@gmail.com

***Article History:**
Received: 25/12/2021
Revised: 30/01/2021
Accepted: 30/01/2022
DOI: https://doi.org/10.7439/ijbr.v13i1.5707

QR Code

How to cite: Okeke KN, Ezeogu J, Echendu ST, Eberendu GI, Okoro JC, Emechebe GO et al. *et al.* Pattern of childhood morbidity and outcome of childhood admission in Imo state University Teaching Hospital Orlu Imo state: A 3 year review. *International Journal of Biomedical Research* 2022; 13(1): e5707. DOI: 10.7439/ijbr.v132i1.5707 Available from: https://ssjournals.com/index.php/ijbr/article/view/5707

1. Introduction

Infections and communicable diseases are the major causes of childhood morbidity and mortality in Nigeria.[1,2] These major causes are preventable through growth monitoring, use of oral rehydration salts in the management of diarrhoea, breastfeeding, immunization, use of insecticide treated nets, family planning, female education, micronutrient supplementations such as vitamin A and zinc and implementation of other child survival strategies. It calls for great concern that despite the preventable causes of childhood deaths and the child survival strategies, childhood mortality rate still remains high in most developing countries.[3] Despite the gains made by the Millennium Development Goals [4,5] which led to the global reduction in under-five mortality rate, with a decrease from 91deaths per 1000 live births to about43 per 1000 live births in 2015 [4], under –five mortality rate is still high in African sub-regions with Nigeria losing about 2,300 children less than 5years per year. According to UNICEF, Nigeria remains the second largest contributor of under-five mortality.[6] In western countries, the annual reduction rate for childhood mortality between 1990-2007 was 3.0% compared to the rate of reduction about1.2% seen in Nigeria.[7]

Major causes of these deaths are perinatal asphyxia, prematurity, septicaemia, malaria, diarrhoeal diseases, malnutrition, acute respiratory diseases and severe anaemia. The major factors responsible for these deaths include late presentation, poor access and utilization of health facilities and use of unorthodox methods of treatment of ailments.[8] Most of these deaths occur in the under-five children and about 40- 60% of these deaths occur within the first 24 hours.[9]

Reviewing the morbidity pattern of hospital admissions and outcome is essential in assessing hospital performance. This assessment will be useful in assessing the services of the hospital and the quality of care in any health institution. It can be used for epidemiological surveillance describing the severity and progression of a given disease or health event. They are also useful tools in learning risk factors of diseases and in comparing and contrasting health events between different populations.

In most developing countries, diseases are under reported and few of the reported cases are based on the data obtained from tertiary institution through the children emergency or paediatrics ward. In Imo state University Teaching Hospital there is no data on morbidity pattern of Paediatric medical admission. It is based on the above that we decided to embark on this study, to evaluate the morbidity and mortality pattern of paediatric medical admission as a first hospital audit.

2. Materials and Methods

This study was conducted at Imo State University Teaching Hospital, Orlu in the South Eastern Nigeria. It is a retrospective study involving all the children above one month of age to 18 years admitted and managed in the paediatric ward from 2010 - 2013. Children with surgical conditions and those with incomplete data were excluded from the study. The Patients were managed by eight paediatrician, one senior registrar and 9 registrars. Case notes of the patients were retrieved and a structured proforma was used to record important information which included their biodata, definitive or probable diagnosis, duration of hospital stay and outcomes. Outcomes were categorized as discharge, death, referred, discharged against medical advice (DAMA) and absconded. Data was presented in tables and charts.

3. Results

A total of 1374 were seen in the department within the study period out of which 103 (7.1%) were excluded due to gross incompleteness of records. Hence a total of 1271 were analyzed comprising 765 (60.2%) males and 506 (39.8%) females in the ratio of 1.5:1 respectively.

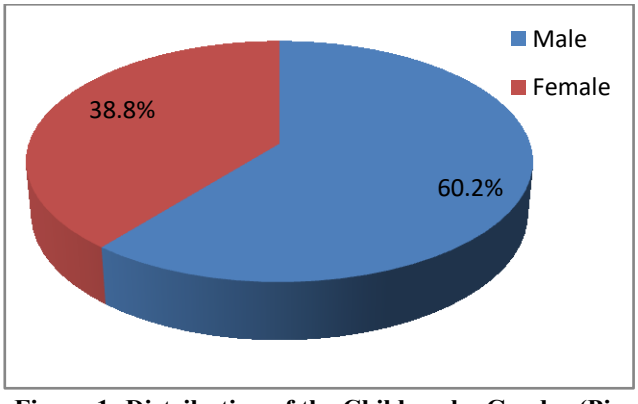

Figure 1: Distribution of the Children by Gender (Pie Chart)

Table 1: Age Distribution of the Children by Gender

Age Group (in years)	Male N=765 (%)	Female N=506 (%)	Total N=1271 (%)
<1	237 (31.0)	166 (32.6)	403 (31.7)
1-5	314 (41.0)	198 (39.1)	512 (40.3)
6-10	91 (11.9)	65(12.8)	156 (12.3)
11-15	103 (13.5)	59 (11.7)	162 (12.7)
>15	20 (2.6)	18 (3.6)	38 (3.0)
Mean±SD	**3.77±4.88**	**3.80±4.79**	**3.82±4.71**
Median	**2.0**	**2.0**	**2.0**

Majority of them (72.0%) were aged ≤5 years with a mean age of 3.82+4.71 years for all the children. Mean age for boys and girls was 3.77±4.88 years and 3.80±4.79 years respectively while the median age was 2 for all the children irrespective of the sex.

Table 2: Disease Distribution pattern among the Children

Disease	Male N=765 (%)	Female N= 506 (%)	Total N=1271 (%)
Malaria	166 (21.7)	118 (23.3)	284 (22.3)
Gastroenteritis	60 (7.9)	49 (9.7)	109 (8.6)
Pneumonia	61 (8.0)	47 (9.3)	108 (8.5)
Sepsis	57 (7.5)	40 (7.9)	97 (7.6)
Tuberculosis	25 (3.3)	20 (4.0)	45 (3.5)
Meningitis	22 (2.9)	16 (3.2)	38 (3.0)
Undernutrition	23 (3.0)	12 (2.4)	35 (2.8)
RVD	20 (2.6)	8 (1.6)	28 (2.2)
SCD	16 (2.1)	10 (2.0)	26 (2.0)
Broncholitis	16 (2.1)	10 (2.0)	25 (2.5)
Nephrotic Syndrome	16 (2.1)	5 (1.0)	21 (1.7)
Lymphoma	15 (2.0)	6 (1.2)	21 (1.7)
AGN	11 (1.4)	9 (1.8)	20 (1.6)
Anaemia	12 (1.6)	7 (1.4)	19 (1.5)
CCF	10 (1.3)	9 (1.8)	19 (1.5)
Cellulitis	9 (1.2)	9 (1.8)	18 (1.4)
Hernia	16 (2.1)	2 (0.4)	18 (1.4)
Tumor	8 (1.0)	9 (1.8)	17 (1.3)
Febrile convulsion	11 (1.4)	2 (0.4)	13 (1.0)
FTT	8 (1.0)	3 (0.6)	11 (0.9)
Seizure disorder	12 (1.6)	0 (0.0)	12 (0.9)
Intestinal Obstruction	7 (0.9)	3 (0.6)	10 (0.8)
UTI	5 (0.7)	5 (1.0)	10 (0.8)
Others	115 (15.0)	107 (21.1)	222 (17.4)
Unspecified	33 (4.3)	12 (2.4)	45 (3.5)

Table 2 shows pattern of distribution among the children by gender. Malaria (22.3%) was the most common disease among the children followed by pneumonia (8.6%), gastroenteritis (8.5%) and sepsis (7.5%). Forty five (3.5%) of the children did not have specific diagnosis.

Table 3: Treatment Outcome Pattern of the Children by Gender

Outcome	Male N=765 (%)	Female N= 506 (%)	Total N=1271 (%)
Discharged	633 (82.7)	427 (84.4)	1060(83.4)
Died	67 (8.8)	47(9.3)	114(9.0)
Referred/Transferred	28 (2.7)	13 (3.2)	41(3.6)
DAMA	20 (2.6)	16 (3.2)	36(2.8)
Unspecified	17 (2.2)	3 (0.6)	20 (1.6)

Most of them were discharged home (83.4%), 114 (9.0%) died while 41 (3.6%) and 36 (2.8%) were referred and discharged against medical advice respectively as shown in table 3.

4. Discussion

The total number of admissions during the period of study was 1374 children; this is similar to the findings in many previous studies.[10-13] However, this figure may not be the true representation of the actual morbidities in the state,[14] as many patients seek for healthcare in places other than the teaching hospital. Some of their caregivers seek for cheaper alternatives such as visiting the chemist shops and auxiliary nurses [15-17], due to worsening economic situation of the country.[15,16] In our environment some parents also believe that some ailments in children are better treated traditionally and hence do not present their children to the hospital.

The under- fives still rank highest among the children that need hospital admission in this present study. This shows that the under-five children are more vulnerable to different childhood diseases. Similar findings were reported by other studies done in Nigeria.[2,18,19] Practice of child survival strategy such as immunization, exclusive breast feeding, use of oral rehydration therapy, roll back malaria should be emphasized especially in children under five years. Malaria, pneumonia, sepsis, and tuberculosis being the commonest diseases seen in our centre and this agree with other previous studies.[17,19,20] The recurrent nature of this observation has shown that the morbidity pattern of children in Nigeria has made no significant change over the years. This may be due to worsening socioeconomic situation, political crisis, insurgency, low immunization coverage and poor implementation of already existing child survival intervention. Delays in presentation and poor management of these conditions are also contributory to the outcomes seen in our environment. Nevertheless, these diseases are preventable through education of the masses on some scientifically proven and culturally acceptable and cheap strategies aim at reducing childhood morbidities and mortalities in children.

More males were admitted compared to females and this is consistent with other previous studies.[13,21,22] The preponderance in male admission may be attributed to the fact that male children are more vulnerable to diseases than females as they explore the environment more and secondly, cultural preferences to male sex may have contributed to more of them being presented to the hospital for medical attention. This sex preference in our region is well documented in the literature.[23] It is interesting to note that despite the lower number of females to males admitted, the percentage mortality among females is higher. The reason for the observed higher mortality among females than males in this study is not clear but may probably be due to better healthcare given to the males due to cultural preference placed on them in terms of nutrition and healthcare.[2,12]. However, other studies done in Nigeria reported higher mortalities in males.[10,24,5] The differences in immune responses in males placing them at increased risks of morbidity and mortality compared to females was the explanation given in these studies.[24,25]

The mortality rate in this study was about 9%. This is similar to the 9.5% and 9.9% reported in other parts of the country.[26,27] It is however lower than the report 11.1%, 12.6% and 15.1% reported in Lagos, Shagamu and Zaria respectively.[2,21,9] Children of under five age group accounted for a significant high proportion (72%) of children's death recorded in the study, which corroborates with other studies.[13,21,22] More females died than males and this could be due to gender preference and better

healthcare seeking for male children than the females and this is consistent with other earlier studies.[18,28,29] The duration of hospital stay by children were short , majority of them were discharged within 7days, this is not surprising because most illnesses in childhood are acute and responds easily to treatment provided the correct diagnosis was made and adequate treatment given.

More than 83% of patients were discharged in the present study. This is slightly lower than 90.5% reported by Okoronkwo *et al* in a mission hospital in Aba, South East, Nigeria.[10] and slightly higher than 78.8% reported by Oninla *et al* in a state specialist hospital in Akure, Ondo State, South Western, Nigeria.[22]. Care of patients in mission and private health facilities are presumed to be better than what is obtainable in our public settings leading to higher discharge rate seen in the study by Okoronkwo *et al*.[10] About 2.8% of the patients were discharged against medical advice and this agrees with previous studies.[10,30] but at variance with study conducted among children in a public secondary healthcare facility.[22] Discharge against medical advice from a hospital facility is a medico-social challenge encountered in clinical practice especially in low income countries. The reason given by the caregivers for DAMA included financial crisis, inconvenience of hospital stay and poor response to treatment, others prefers outpatient treatment, dissatisfaction with the attitudes of hospital staff and hopeless nature of the patient illness, perception that the child is well enough and long stay in the hospital.

Overall, mortality was higher in females while males were more prone to diseases. Infectious diseases were the predominant causes of morbidity and mortality in the tertiary institution and under-five children mostly affected than other age group. Infections and Vaccine preventable diseases still rank highest in this study especially among the under-five. This is unacceptable. More effort is needed both by government and other non-governmental partners in the health sectors to ensure that this is reversed by intense immunization and also by strengthening all the child survival strategies. Malaria control, treatment of those with tuberculosis and contact tracing, use of oral rehydration salt, micronutrient supplementation, environmental sanitation, are all necessary to reverse this trend. Reinforcement of other child survival strategy, National programme on immunization, early diagnosis in children, implementation of prevention of mother to child transmission of HIV are all crucial in reducing childhood mortality.

Limitation:

Some of the cases encountered had incomplete data and this is a known limitation of retrospective studies. Secondly, mortality in this study was not grouped according to patients' ages and diagnosis.

Acknowledgement

Great thanks to all that contributed to this work from the initial design to its final form.

Funding: This study was funded by the researchers. There was no direct or indirect cost to the patients.

Authors' contribution: Ezeogu J, Eberendu IG, Emechebo GO, Okoro JC were involved in the conceptual design and implementation of the project. Okeke KN and Echendu ST wrote the manuscript and were involved in the overall revision of the manuscript.Other authors were involved in the review of the manuscript. All the authors read and approved the final manuscript.

Competing interests

The authors declare no competing interest.

References

[1]. George IO, Tabansi PN, An audit of cases in the children emergency ward in a Nigerian Tertiary hospital. *Park J Med Sci* 2010:26:740-3

[2]. Abhulimhen-iyoba BI, Okolo AA. Mortality and morbidity of childhood illnesses at the emergency Paediatric unit of the University of Teaching Hospital, Benin City. *Niger J Paed* 20`12; 39:71-4.

[3]. Gayawan E, Adarabioyo MI, Okewole DM Fashoto SG, Ukaegbu JC. Geographical variation in infant mortality in West Africa: a geo-additive discrete-time survival modelling. *Genus* 2016; 72:5:1-20.

[4]. WHO. Global Health Observatory Data Repository. Accessed 20 November, 2021.

[5]. Iyanam VE, Udoh SB, Morgan UM. Pattern of morbidity among children under five years of age seen at rural health care facility in South -South, Nigeria. *Ibom Med J* 2019; 11:19-25.

[6]. UNICEF. The state of the World's children 2009: Statistical tables, United Nations Children's Fund, New York.

[7]. Fajolu IB, Egri-Okwaji MTC. Childhood mortality in the children emergency centre of the Lagos University Teaching Hospital. *Niger J Paed* 2011; 38: 131-5.

[8]. Menge I, Esamai F, Van Reken D, Anabwani G. Paediatric morbidity and mortality at Eldoret District Hospital, Kenya. East Afr Med J 1995; 72: 165-9.

[9]. Wammanda RD, Alli FU. Conditions associated with the risk of death within 24hours of admission in Zaria, Nigeria. *Annals of African Medicine* 2004; 3:134-7.

[10]. Okoronkwo NC, Onyearugha CN, Ohanenye CA. Pattern and outcomes of paediatric medical admissions at the Living Word Mission Hospital, Aba, South East Nigeria. *Pan Afr Med J* 2018; 30(202).

[11]. Edelu BO, Eze JN, Oguonu T, Ndu IK. Morbidity and mortality pattern in the Children Emergency Unit of

the University of Nigeria Teaching Hospital Enugu. *Orient J Med* 2014; 26:73-8.

[12]. Eck C, Pierre RB, Hambleton IR. Medical paediatric admission patterns at the University Hospital of the West Indies: issues for future planning. *West Indian Med J* 2006; 55:340-5.

[13]. Khan HI, Khaliq N, Afzal MF. Paediatric intensive care unit: Pattern of admissions. *Professional Med J* 2006; 13:358-61.

[14]. Adejopu AO. Differential pattern in child mortality rate in rural Nigeria. Ann Res Rev Bio 2015; 7:309-17.

[15]. Eko JE. Implication of economic recession on the health care delivery system in Nigeria. *Soc Sci* 2017; 6:14-8.

[16]. Ekeopara CA, Ugoha AM. The contributions of African traditional medicine to Nigeria's health care delivery system. *Int Org Sci Res-J Human Soc Sci* 2017; 22(5):32-43.

[17]. Adefolaju T. Traditional and orthodox medical systems in Nigeria: The imperative of a synthesis. *Am J Health Res* 2014; 2(4):118-24.

[18]. Okoronkwo NC, Chapp-Jumbo AUN. Pattern of morbidity and mortality of childhood illnesses at the emergency paediatric unit of Abia State University Teaching Hospital, Aba, Nigeria. *East Cent Afr Med J* 2015; 2: 70 -3.

[19]. Chukwu BF, Chinawa JM, Ikefuna AN, Emodi IJ. Pattern and outcome of paediatric medical admissions at the University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla, Enugu: a five year retrospective review (2007-2011). *Niger J Paed* 2013; 40:354-59.

[20]. George IO, Alex-Hart BA and Frank-Briggs AI. Mortality pattern in children: A Hospital-Based study in Nigeria. *Int J Biomed Sci* 2009; 5(4):369-72).

[21]. Fetuga B, Ogunlesi T, Adekanbi F, Olanrewaju D, Olowu A. Comparative analyses of childhood deaths in Sagamu, Nigeria: implications for the fourth MDG. *South Afr J Child Health* 2007; 1:106-11.

[22]. Oninla SO, Fadugbagbe AO, Oninla OA, Otetubi OA. Pattern of childhood morbidities and outcome of childhood admissions in a Nigerian public secondary healthcare facility. *Annals of Health Research* 2018; 4:162-73.

[23]. Kam-lin EH, Edmund ASN. Gender disparity in paediatric Hospital admissions. *Ann Acad Med Singapore* 2006; 35: 882- 88.

[24]. Muenchhoff M, Goulder PJR. Sex differences in paediatric infectious diseases. J Infect Dis 2014; 209: 120-6.

[25]. Lozano R, Naghari M, Foreman K, Lim S, Shibuya K, Aboyema V, *et al*. global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the global burden of disease study 2010. *Lancet* 2012; 280:2095-128.

[26]. Ayoola OO, Orimadegun AE, Akinsola K. A five-year review of childhood mortality at UCH, Ibadan. *West Afr J Med* 2005; 24:175-9.

[27]. Aikhionbare HA, Yakubu AM, Naida AM. Mortality pattern in the emergency paediatric unit of Ahmadu Bello University Teaching Hospital Zaria. *Cent Afr J Med* 1989; 35:393-6.

[28]. Sa'ad YM, Hayatu A, Al-Mustapha II, Orahachi YM, Hauwa MU. Morbidity and mortality of childhood illnesses at the emergency paediatric unit of a tertiary hospital, North-Eastern Nigeria. *Sahel Med J* 2015; 18:1-3.

[29]. Anyanwu OU, Ezeanosike OB, Ezeonu CT. P attern and outcomes of admissions at the children emergency room at Federal Teaching Hospital Abakaliki. *Afr J Med and Health Sciences* 2014; 13: 6-10.

[30]. Onyiriuka AN. Morbidity and mortality patterns of post-natal paediatric medical admissions in a large mission hospital in Benin City, Nigeria. *J Biomed Sci* 2005; 4(1):49-58.