**Original Research Article**

**CHARACTERISATION OF PAEDIATRIC PATIENTS HOSPITALISED WITH COMMUNITY ACQUIRED PNEUMONIA IN ABUJA: A RETROSPECTIVE STUDY**

**ABSTRACT**

**Background**

Pneumonia is a leading cause of morbidity and mortality in children globally, with Nigeria contributing the largest figures to mortality. Majority of such deaths occur in children less than two years of age. Despite the disease being preventable, millions of children remain unvaccinated and do not receive essential medical care when symptomatic.

**Aim**

The aim of the study was to determine the prevalence, pattern and outcomes of paediatric patients diagnosed with community acquired pneumonia (CAP) at an Emergency Paediatrics Unit.

**Methods and materials**

It was a retrospective study carried out over a period of five years, 2019-2023 among patients diagnosed and hospitalised with CAP in the Emergency Paediatrics Unit. Patients with comorbidities such as sepsis, congenital or acquired heart disease, sickle cell disease, HIV and severe acute malnutrition were excluded from the study.

**Results**

A total of 7,652 patients were admitted into EPU during the study period of which 426 (5.6%) had CAP. Majority were males 272 (63.8%) while 230 (54%) got discharged and 34 (8%) deaths were recorded. Mortality was highest among males 20 (58.8%) and in children below the age of 1 year, 23 (67.6). The year, 2019, the rainy season and the month of July, recorded the most hospitalisations, 133 (31.2%), 271 (63.6) and 68 (16%), respectively.

**Conclusion**

The prevalence of pneumonia in this study was comparable with other local and global studies. Evidence-based prevention interventions such as vaccination, exclusive breastfeeding, adequate complimentary feeds, air pollution reduction, along with adequate funding, need to be implemented at a larger scale to reduce the pneumonia scourge and meet target goals.

Key words: Pneumonia; Paediatrics; Emergency; Hospitalisation; Mortality

**INTRODUCTION**

Pneumonia is a leading cause of morbidity and mortality in children globally, with Nigeria contributing the largest number to mortality1 Most child pneumonia deaths occur in children less than two years of age.1 The major risk factors identified in Nigeria include malnutrition, indoor air pollution from use of solid fuels, and outdoor air pollution1**.** Nigeria has the highest number of household air pollution-related pneumonia deaths among children under-five mainly due to the use of poor cooking methods using cook stoves or open fires2

Various intervention strategies have been put in place to protect, treat and prevent pneumonia such as the WHO and UNIEF integrated Global Action Plan for Pneumonia and Diarrhoea (GAPPD) to be achieved by 2025. The goals planned to reduce pneumonia mortality to fewer than 3 per 1000 live births and to reduce the incidence of severe pneumonia by 75% when compared with 2010 levels, both goals in children aged less than five years.

Prevention of pneumonia can be achieved with the use of vaccines, adequate nutrition, healthy environments, among others while treatment is mainly with antibiotics and oxygen when required.2 Unfortunately, millions of children remain unvaccinated and do not receive essential medical care when symptomatic.2Mild to moderate cases of pneumonia can be treated at home with oral medications but severe cases require hospitalisation. This study aims to determine the prevalence, pattern and outcomes of paediatric patients diagnosed with community acquired pneumonia (CAP) at the Emergency Paediatrics Unit EPU) of the University of Abuja Teaching Hospital (UATH), Abuja, Nigeria.

**METHODS AND MATERIALS**

The study was carried out at EPU of UATH, Gwagwalada, Abuja, Nigeria, a 500-bed tertiary health facility that serves the local community, Abuja Federal Capital Territory and surrounding states. The EPU provides 24-hour service to children aged 29 days to 19 years. There are always doctors, nurses, pharmacists and other support staff on duty that tend to many children with a broad variety of cases. An average of about 90 patients are hospitalised monthly in the unit.

The diagnosis of CAP was based on clinical symptoms, signs, and chest radiograph findings. Patients with comorbidities such as sepsis, congenital or acquired heart disease, sickle cell disease, HIV and severe acute malnutrition were excluded from the study. Data on age, gender, month and year of hospitalisation, duration of stay and outcomes of treatment were obtained and analysed using SPSS version 20. Categorical variables have been presented using frequency tables and charts. Ethical clearance was obtained from UATH Health Research and Ethics Committee. No identifiers were used to ensure confidentiality and privacy of patients.

**RESULTS**

A total of 7,652 patients were admitted into EPU during the study period of which 426 (5.6%) had CAP. The age range was from 30 days to 19 years while the duration of stay in EPU was less than 24 hours to 26 days. Majority of the patients were males 272 (63.8%) giving a male to female ratio of 1.8 to 1. There were 230 (54%) discharges from EPU, 147 (34.5%) transferred to other wards and 34 (8%) deaths. These are shown in Table 1.

Table 1: General characteristics of hospitalised patients in EPU

|  |  |
| --- | --- |
| **Variable** | **Frequency (%)**  n = 426 |
| Gender  Males  Females | 272 (63.8)  154 (36.2) |
| Age  >1 year  1-4 years  5 – 9 years  10 – 19 years | 226 (53.1)  114 (26.8)  51 (11.9)  35 (8.2) |
| Discharged from EPU | 230 (54) |
| Transferred to other wards | 147 (34.5) |
| Mortality | 34 (8) |
| Signed against medical advice | 13 (3.1) |
| Absconded | 1 (0.2) |
| Referred to other hospital | 1 (0.2) |

Mortality according to age

Majority of the 34 patients who died were below the age of one year 23 (67.6%) and were males, 20 (58.8%). The least number of deaths occurred in children aged five to nine years, 2 (5.9%). This is shown in Table 2.

Table 2: Mortality according to age and gender

|  |  |
| --- | --- |
| Mortality | Frequency (%)  n = 34 |
| Age  <1 year  1-4 years  5 – 9 years  10 – 19 years | 23 (67.6)  8 (23.5)  1 (2.9)  2 (5.9) |
| Gender  Male  Female | 20 (58.8)  14 (41.2) |

The year, 2019 recorded the most hospitalisations 133 (31.2%) with the least occurring in the year, 2020, 57 (13.4%). The years, 2021, 2022 and 2023 recorded annual proportions of 62 (14.6%), 86 (20.2%) and 88 (20.6%), respectively.

Fig 1- Annual distribution of hospitalisation

The rainy season, from April to October recorded majority of hospitalisations 271 (63.6%). The leading months with the most hospitalisations for pneumonia were July 68 (16%) and March, 55 (12.9%) while December had the least number of hospitalisations 17 (4%).

Fig 2-: Seasonal and monthly distribution of hospitalisation

**DISCUSSION**

The proportion of pneumonia among children and adolescents with CAP in this study was less than that reported in studies in Akwa Ibom, Lagos and Rivers States, in Nigeria,3,4,5 This may be due to the difference in the age of the patients as this study assessed a wide age range of a month-old babies to 19-year-old adolescents while the others used mainly under-fives. This study population also excluded patients who had comorbidities while the other studies did not. Comorbidities may have an effect on the outcomes studied. Pneumonia was the leading respiratory disease reported in a study in Enugu.6 Males made up a larger proportion of patients with pneumonia and also had a higher mortality similar to reports from other studies.3,4,5 Most patients were less than 1 year old, similar to findings in other studies3,4,5 and most deaths occurred in this group of children similar to reports from other studies.3,5 Infants generally have much lower immunity levels and so are more likely to succumb to infections. The report suggests that management of pneumonia in infants needs to be quite proactive and aggressive.

The proportion of deaths was higher in this study than that reported in the southern part of Nigeria.5 The difference may be because that study assessed patient outcomes over a shorter duration and also used a smaller sample size with a narrower age group compared with this.

Some patients were discharged against medical advice while one absconded from the hospital. Studies have shown that the major cause of these occurrences is financial constraints.7 Universal health coverage may help prevent patients leaving against medical advice and play important roles in the management of pneumonia. The Nigerian government needs to broaden and strengthen the health insurance coverage in the country.

The number of patients hospitalised dipped in the year, 2020. This was most likely due to the social and economic effects of the use of face masks, lockdown and reduced movements of people during the early phase of COVID in 2020. Several public places such as schools, markets, health facilities and religious houses were closed which greatly reduced physical interactions among people including children and adolescents, which in turn reduced spread of respiratory infections and child vaccination as well increased financial constraints among other factors. Subsequently, the hospitalisation rates gradually increased annually but not to the numbers recorded prior to COVID in 2019.

The rainy season recorded most of the pneumonia cases similar to findings in other studies.5,6 The rainy season promotes indoor-seeking behaviours, indoor overcrowding as well as pathogen stability from reduced ultraviolet radiation and humidity.8 These can promote the spread of respiratory infections. In contrast, another study did not report any consensus effect of the season on the number of pneumonia cases.9 They attributed the difference to the use of non-continuous data collection over the study years.9 In that study, the data collection was from two states located in the northern and southern parts of Nigeria with different weather patterns.9 The northern part of Nigeria where Abuja is located, tends to have a hotter, drier and dustier harmattan weather in the dry season while a heavier, humid, rainy season occurs in the southern part. That study9 also used data from over a decade ago, climate change may have had an effect over the years on the weather. The study population also was not restricted to only patients with pneumonia but also included other acute respiratory tract infections. The monthly admission pattern showed July with the highest number of hospitalisations. This is similar to the report from other studies in Nigeria. Although these studies also looked at respiratory diseases in total and not pneumonia specifically.6,10

This study was limited by its retrospective study design with the possibility of incomplete data, selection bias and inability to determine causality. Majority of the mortality occurred in infants, future studies with larger sample sizes are required to determine the causes of mortality in this age group and reduce the proportion. Studies to determine the aetiologic organisms including viral seasonality such as for Respiratory Syncytial Virus and influenza virus are also needed.

**CONCLUSION**

The prevalence, pattern and outcomes of pneumonia in this study were comparable with other local and global studies. Pneumonia remains a huge burden globally especially in children. The well-known preventive intervention strategies such as vaccination, exclusive breastfeeding, adequate complimentary feeding, air pollution reduction, along with adequate funding need to be implemented at a larger scale to reduce the pneumonia scourge and meet target goals.

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