Adult Respiratory Disease Patterns Seen at The Adult Emergency Unit of a Tertiary Health Facility in South Eastern Nigeria – A Five-Year Review

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ABSTRACT

Background:
Respiratory illnesses remain a significant contributor to disease burden worldwide, accounting for up to 10% of deaths and DALYs. This study aimed at assessing the pattern of respiratory diseases seen among adults in an emergency room (ER), their mortality within twenty-four hours in a health facility in Nigeria and the health seeking behaviour of a south-eastern Nigerian community.

Methods:
We carried out a retrospective study on adult patients that presented with respiratory conditions from July 2012 to June 2016 at the emergency room of Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi in South Eastern, Nigeria.

Results:
A total of 5888 medical cases were seen, of which 131 were respiratory cases accounting for 2.2 % of the total ER visitations. The male to female patient ratio was 1.62:1 and their mean age was 50.19 ± 19.56 years. The median duration of symptoms from onset till presentation was 30 days. Pulmonary TB (PTB) (32.1%) was the commonest case seen in the series, followed by acute asthma (19.8%) and Pneumonia (16.0%). Twenty-four-hour mortality was 4.6% with half of the deaths attributable to TB, while pneumonia, asthma and interstitial lung disease made up the rest. Mortality was highest in the 40 – 49-year age group.

Conclusion:
Pulmonary TB and acute asthma were the commonest respiratory diseases among adults leading to ER visits in this facility, with PTB accounting for most early deaths. Late presentations are still rife and present an opportunity for health education and reorientation.

Key words: Emergency, respiratory illness, 24-hour mortality, Nigeria.

INTRODUCTION

Respiratory illnesses remain a major cause of death worldwide among both the adult and paediatric population and are responsible for 12% of all deaths worldwide.[1] The burden of respiratory diseases is well documented; they accounted for 10.4% of all deaths and 9.8%

of all Disability-Adjusted Life Years (DALYs) in 2019.[2] In Nigeria, lower respiratory tract infections constituted the second leading cause of death in all age brackets in 2002. In the same year, tuberculosis (TB) accounted for 4% of all deaths.[3]

It has been shown that the prevalence of respiratory symptoms in a given population is a reliable indicator from an epidemiological perspective of acute and chronic respiratory diseases.[1,4]

Few studies have examined utilisation of adult emergency medical services in Nigeria,[5-7] although utilisation of paediatric emergency medical services has been well documented.[8-12]

Even fewer studies on the pattern of respiratory medical presentations in the adult population have been documented.[13,14]

We undertook a five-year review to assess the pattern of respiratory diseases, health seeking behaviour and mortality outcomes within 24 hours of presentation of adults seen at the emergency room of the Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi.

METHODS

A retrospective folder audit of emergency presentations at the emergency department of the NAUTH, Nnewi was carried out. Medical records of patients (aged ≥18years) who visited the emergency department of the hospital from July 2012 to June 2016 and who were diagnosed with respiratory diseases were retrieved from the Health Records Department and reviewed. The socio-demographic information, presenting complaints, durations from symptom onset to presentation, seasons of admission and outcome of management of patients were extracted and catalogued in a form/datasheet. Two major seasons are typically experienced in this part of the world, viz a rainy season that spans from April to October and a dry season from November to March. Missing folders and/or folders with incomplete clinical records were excluded from the study.

The data collected were analysed using statistical package for social sciences (SPSS) version 21. Descriptive and frequency statistics were obtained for the variables. Pearson Chi-square test was used to test for the association of categorical variables and a p-value of <0.05 was considered significant.

RESULTS

A total of 5888 medical cases were seen at the emergency room over the period of study. One hundred and eighty-nine folders of patients with respiratory diagnoses were reviewed, of which 58 were excluded. A total of 131 folders were analysed, accounting for 2.2% of the total emergency department medical visitations (figure 1).

The mean age at presentation was 50.19 ± 19.62 years (range 18 – 94 years). Eighty-one males, accounting for 61.8% of the participants, and 50 (38.2%) females were represented with a male:female ratio of 1.62:1. The age distribution of the study participants are as shown in table 1. About a third (35.1%) of the participants were above 60 years, and were mostly (73.9%) of the male sex. More than two-thirds of the study participants were married (67.9%), while 29 (22.1%) were single, 12 (9.2%) were widowed and 1 (0.8%) was separated. Majority of the study participants were of the Igbo tribe [129

(98.5%)] and practiced Christianity as a religion [129 (98.5%).

Cough (39.5%), dyspnoea (25.7%) and fever (10.7%) were the foremost presenting complaints of this cohort (table1) and pulmonary tuberculosis (42.1%), acute asthma (19.8%) and pneumonia (18.3%) were the top diagnoses amongst the cohort (table 2). The shortest interval between symptom onset and presentation was found in those who had such diagnoses as pulmonary embolism, aspiration syndromes and costochondritis (ranging from 1 – 3 days) while the longest intervals between symptom onset and presentation was found in those who were diagnosed of pulmonary tuberculosis (up to 3 years).

Retroviral positivity was present in 27 (20.6%) of cases, while hypertension and Type II Diabetes mellitus (DM) were found in 24 (18.3%) and 22 (16.8%) of the patients, respectively.

More than half (51.1%) of the presentations occurred during the dry, harmattan season as against 48.9% during the rainy season; this was, however, statistically insignificant. There were no significant variations observed in the emergency presentation of acute severe asthma (OR 1.05, [95% CI: 0.45 – 2.50]; p=0.828), acute exacerbations of chronic obstructive pulmonary disease (COPD) (OR 1.37, [95%CI: 0.50 – 3.71]; p=0.622), or pneumonia (OR 0.77, [95% CI: 0.17 – 3.61]; p= 0.739) during the rainy season compared to the dry season.

Fifty-five (42.0%). of the presentations resulted in eventual admissions, of which 1 (1.8%) required intensive care unit (ICU) admission. About 37.4% (49/131) of the patients were discharged home from the emergency room (figure 2). The average duration of emergency admission was 3.19±0.3 days (range 1 – 25 days).

The 24-hour mortality over the period was 4.6% (6/131) and there were no significant differences in the mortalities between the sexes (4 vs 2 in males and females, respectively; p =0.583). All of the deaths amongst the females occurred in the age group above 60 years while the majority of deaths in the males were observed in the under-50 age group. Tuberculosis was responsible for most of these deaths in the males [3 (75%)] while interstitial lung disease was responsible for the death in the elderly male in the series [1 (25%)]. The female mortalities were each a case of asthma [1 (50%)] and pneumonia [1 (50%)].

DISCUSSION

We have attempted to describe the pattern of adult emergency respiratory presentations and early mortality in a tertiary health facility over a 5-year period. Respiratory diseases accounted for 2.2% of the emergency medical visits during the period of study. This value is much lower compared to results from Brazil (5.8%),[15] southwestern Nigeria (10%)[13] and the UK (13%).[2] Valença et al[15] reported a majority of the emergency respiratory presentations in their series to be of an upper respiratory infectious origin and understandably so too, as a modest proportion of their study cohort were children. Severe upper respiratory tract infections leading to emergency department presentations tend to occur mostly in children compared to adults. Since data from the emergency children department were not utilized in this study, it is conceivable that the practice of using home remedies and over-the-counter treatments for a majority of upper respiratory ailments may have

contributed to the lower prevalence observed in our series.

More than a third of the cases seen were >60 years, reflecting the increased risk to an ageing population of respiratory illnesses, and in keeping with previous studies.[13,14] Common comorbid conditions in our series included HIV infection, hypertension and diabetes mellitus; they are known predispositions to respiratory illnesses and represent the interaction between communicable and noncommunicable illnesses in the geriatric population.[14]

Pulmonary TB was the leading cause of ER visits, accounting for 32.1% of presentations. It was followed by acute asthma attacks (19.8%) and pneumonia (18.3%). Acute exacerbations of COPD made up 5.3% of the cases. This differs from a study in southwestern Nigeria where pneumonia (34.5%), PTB (29.4%) and acute asthma (24.5%) were the leading causes of emergency room visits for respiratory disease.[13] The reason for these differences is not at once clear but may reflect health-seeking behaviours of the population and the tendency to self-medicate with antibiotics for any case of presumed 'pneumonia' before presenting to a health practitioner for treatment. It differs significantly from data from Brazil where pneumonia (13.8%), influenza (13.8%) and upper respiratory tract infections [URTI] (11.3%) made up most of the emergency room visits, with PTB contributing only 0.9% of cases.[1] Nigeria is one of the high burden countries for TB and this may account for the disproportionate presentation of this condition to the emergency department compared to other countries.[16] Also, local epidemiological differences in the causation of illness may contribute to the disparate patterns of presentations.

Pleural effusion was a complication in a third of PTB cases whereas cor pulmonale was a recognized complication in 9.5% of cases. This is significantly lower than the findings of a study in southwestern Nigeria where 2.5% and 3.8% of PTB was complicated, respectively, by pleural effusion and cor pulmonale.[13] Because pleural effusions from PTB tend to accumulate over weeks to months, this difference in the prevalence of pleural effusion between the studies may reflect the health-seeking behaviour of the different populations.

There was a tendency to presentation later than a week after onset of symptoms. This tendency was common to both genders with no statistical difference in the time to presentation from symptom onset ($t = -0.848$; $p=0.398$). This is particularly worrisome when it is considered that, for PTB, a disease of public health importance, the time to presentation from onset of symptoms was almost 100 days. Given that health-seeking behaviour is a composite of numerous factors not assessed in this review including the effect of age, level of education, employment status, access to care, symptom complex but to mention a few, the use of time of presentation from symptom onset as its marker of health-seeking behaviour may not be truly representative. Analysis of the effect of time to presentation from symptom onset on need for hospitalization and mortality was not carried out in this study. However, there has been a correlation of the effect of level of education and age on the time to presentation from symptom onset, as well as correlation of the latter with need for

hospitalization and mortality in both adult and paediatric populations presenting to the emergency room in Brazil.[1]

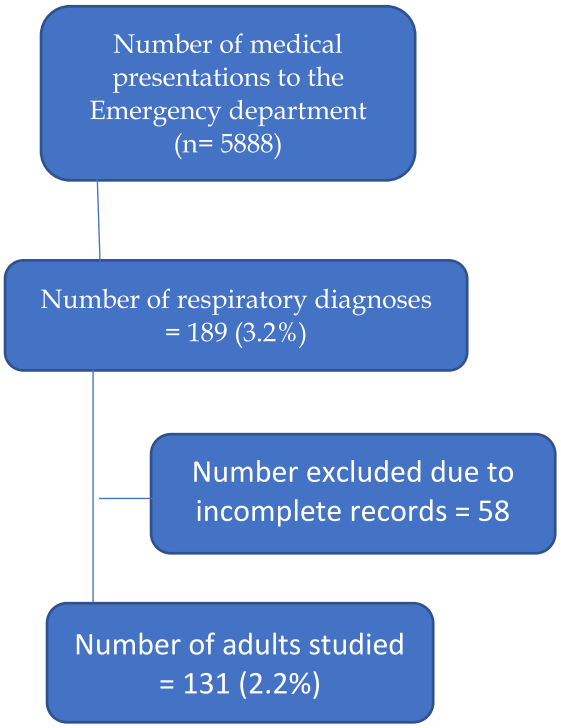
There were proportionate presentations during the dry season compared to the rainy season in our series (51.1% vs 48.9%). We did not observe any seasonal variations in the presentations of asthma, acute exacerbations of COPD or pneumonia that have been reported in previous studies.[15,17] While the amount of indoor air pollution, allergen burden and increased relative humidity may contribute to a higher incidence of respiratory illnesses, the significant increase in bush burning activities that characterises the dry seasons may neutralise any seasonal variations in the occurrence of respiratory illnesses reported elsewhere.

Mortality within 24 hours was 4.6% and was highest in the 40 – 49 and ≥70 years age group. This bimodal trend is similar to the findings of Desalu et al.[13] Tuberculosis contributed to 50% of the early mortalities which is slightly greater than the 44.4% reported in the South Western Nigerian study.[13] Pneumonia was responsible for 16.7% of deaths in our series and there were no obvious associations between the social and demographic variables of the cohort and mortality in the study. Overall, the patterns of mortality outcomes are comparable in both studies, being that infectious causes contributed significantly to early mortality among adult patients presenting with respiratory illness.

We acknowledge a few limitations to our study. The study's retrospective nature with its relatively small sample size limits the degree of extrapolation possible from the data presented. A prospective study would help clarify the true state of things in this respect. The study also did not distinguish referrals from other health facility from first time contact with the health system as a measure of true health seeking behaviour.

We can conclude, nevertheless, that emergency respiratory illnesses, especially those of an infectious nature, still contribute significantly to morbidity and mortality in our environment. Chronic respiratory conditions present with acute exacerbations or complications that warrant emergency care. Pulmonary TB is a significant cause of mortality and morbidity even in the emergency setting. Public health education and health promotional activities are encouraged to improve the health-seeking behaviour of the community.

Figure 1. Summary of study recruitment



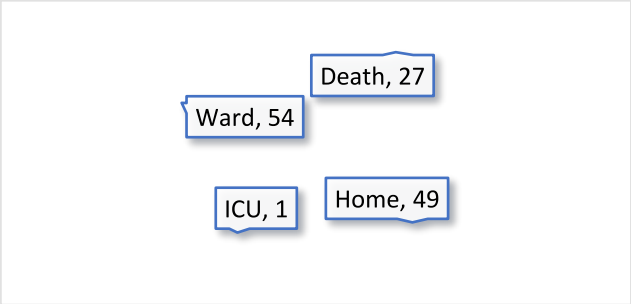


Figure 2. Final outcome of emergency department admission

Table 1. Principal characteristics of the patients

Characteristic		No. (%) N = 131
Age, years[a]		50.19 ± 19.62
Age group		
	18 – 24	11 (8.4)
	25 – 34	21 (16.0)
	35 – 44	25 (19.1)
	45 – 54	20 (15.3)
	55 – 64	19 (14.5)
	65 – 74	21 (16.0)
	75 – 84	6 (4.6)
	85 and above	8 (6.1)
Male gender		50 (38.2)
Igbo tribe		129 (98.5)
Married		89 (67.9)
Christianity		129 (98.5)
Presenting symptom[b]		
	Cough	103 (39.5)
	Dyspnoea	67 (25.7)
	Fever	28 (10.7)
	Weight loss	13 (5.0)
	Chest pain	12 (4.6)
	Wheezing	1 (0.4)
	Haemoptysis	1 (0.4)
	Others	36 (13.8)
Symptom duration prior to presentation, days		
	Longest duration, *Mean* ± *SE*	130.1 ± 28.1
	Shortest duration, *Mean* ± *SE*	81.5 ± 26.9
Season of presentation, Rainy		64 (48.9)
Comorbidity		
	HIV	27 (20.6)
	Hypertension	22 (16.8)
	Diabetes mellitus	24 (18.3)
Smoker		32 (24.4)

[a] Mean ± Standard deviation; [b] Total symptom count is 261.

Table 2: Distribution of admitting diagnoses by gender and mean duration of symptoms prior to presentation

Diagnosis	Female No (%)	Male No (%)	Total No (%)	Mean (± SE) duration (in days)
Pulmonary Tuberculosis	20 (15.3)	22 (16.8)	42 (32.1)	98.86 ± 25.53
Acute Severe Asthma	13 (9.9)	13 (9.9)	26 (19.8)	12.15 ± 9.16
Pneumonia	7 (6.1)	14 (12.2)	21 (18.3)	23.28 ± 4.97
Pleural Effusion	5 (3.8)	4 (3.1)	9 (6.9)	31.89 ± 12.29
Acute exacerbation of COPD	2 (1.5)	5 (3.8)	7 (5.3)	122.46 ± 102.00
Metastatic Lung Disease	1 (0.8)	4 (3.1)	5 (3.8)	31.00 ± 15.98
Empyema Thoracis	-	5 (3.8)	5 (3.8)	98.20 ± 51.09
Disseminated Tuberculosis	1 (0.8)	4 (3.1)	5 (3.8)	43.00 ± 14.13
Interstitial Lung Disease	-	3 (2.3)	3 (2.3)	77.00 ± 51.57
Pneumothorax	-	1 (0.8)	1 (0.8)	14.00 ± 0.00
Bronchiectasis	-	1 (0.8)	1 (0.8)	3285.00 ± 0.00
Pulmonary Embolism	-	1 (0.8)	1 (0.8)	1.00 ± 0.00
Aspiration Pneumonitis	-	1 (0.8)	1 (0.8)	2.00 ± 0.00
Costochondritis	1 (0.8)	-	1 (0.8)	3.00 ± 0.00
Non-Hodgkin Lymphoma	-	1 (0.8)	1 (0.8)	120.00 ± 0.00
Airway Obstruction	-	1 (0.8)	1 (0.8)	30.00 ± 0.00
Bronchogenic CA	-	1 (0.8)	1 (0.8)	30.00 ± 0.00

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