Pattern of Respiratory Disease Admissions among Adults at Federal Medical Centre, Owo, South-West, Nigeria: A 5-Year Review

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Abstract

Background: Respiratory diseases constitute an important proportion of the global health burden. This burden is expected to rise. There are few studies documenting the pattern of respiratory admissions across the West African sub-region. Available studies are mostly old;thus the probable changing pattern of respiratory diseases with changing time trend has not been adequately explored particularly with compounding effect of HIV and increasing environmental pollution. **Objective:** This study aimed at documenting the pattern of respiratory diseases admissions at FMC, Owo and to highlight the outcomes among the patients. **Method:** It was a retrospective study of the medical records of all the patients admitted into the medical wards of FMC, Owo between January, 2007 and December, 2012. We extracted data for 502 patients who were admitted with respiratory diagnoses. We summarized the data by frequency tables and figures. **Result:** Over half (54%) of the patients were males and out of this (i.e., the males), one third of them were in the 25-44 years age group. Less than 10% of the patients were 24 years and below, while one quarter of the patients were aged 65 years and above with over 60% of the elderly were also males. The top five respiratory diseases were tuberculosis (TB), pneumonias, chronic obstructive pulmonary diseases (COPD), asthma and lung cancer (53%, 21.1%, 13.7%, 8.4% and 1.4% respectively). Among the people with tuberculosis, 33% were co-infected with HIV. **Conclusion:** Tuberculosis and other communicable diseases remain an important cause of respiratory admissions in our study. Although our study is hospital-based, it serves as a preliminary report upon which larger studies can build. There is need to optimize preventive measures for the reduction of communicable respiratory diseases and also improve the capacity for the detection of non-communicable ones like lung cancer that appears to be uncommon in our study.

Keywords: Respiratory; Diseases; Tuberculosis; Pneumonias; COPD

Introduction

Respiratory diseases constitute an important proportion of the global health burden. [1]. The lung is in constant contact with the external environment and is therefore susceptible to diverse environmental insults. [2]. These insults range from toxic gases and particulate matter to infectious agents. Efforts have been made to raise awareness on lung diseases with a view to influencing policy decisions that will favour better lung health. [3]. Lung diseases nevertheless, still rank among the five leading causes of mortality worldwide and Africa bears a significant proportion of this. [4]. Over the next ten years the continent is projected to experience the largest increase in death rates from cardiovascular disease, cancer, respiratory disease and diabetes. [5]. This is as a result of the compounding effects of worsening environmental pollution, [6]. increase smoking, [7]. HIV, [8]. Tuberculosis [9]. and exposure to biomass fuel. [10]. Age-standardized death rates from chronic obstructive pulmonary diseases (COPD) are highest in low –income countries particularly sub-Saharan Africa. [11].

Asthma currently affects an estimated 300 million people worldwide and is projected to increase to 400 million by the year 2025. [12]. Data from Africa shows an escalating burden in asthma prevalence due to rapid urbanization and increasing air pollution. [13]. The prevalence of Asthma ranges from 3% -18% [14-18]. in Nigeria as documented by various studies and depending on the criteria for definition.

The problem of COPD equally portends a grave situation as the prevalence is currently estimated at about 7.7% in Nigeria [19]. and as high as 15% in other African countries like South-Africa. [20].

The multi-faceted problem of Tuberculosis including TB/HIV co-infections, multi-drug resistance TB and extreme drug resistant TB continues to pose a global challenge. [21].

All these, coupled with the problems of dwindling resources, weak and non-existent infrastructures and few well-trained

manpower are some of the gaps in low and middle income countries of the world.

Data from Africa regarding pattern of respiratory disease is scanty and mostly not recent. [22-26]. The pattern of respiratory disease in Nigeria is not well described. One of the challenges of accurate quantification is poor documentation and lack of regular audit of practice.

This study was undertaken to contribute to the body of existing information about the pattern of lung diseases presenting to a tertiary hospital in South-West, Nigeria.

Methods

Study design

It was a retrospective study of hospital admission records.

Participants

Out of the 914 patients who presented for a respiratory disorder between the period of January, 2007 to December, 2012 at the FMC, Owo, we reviewed the medical records of 502 patients who were admitted in the medical wards on account of respiratory diseases and diagnoses which was our main inclusion criteria. The diagnoses we entered were that documented by the most senior member of the various unit involved in the management of the patient. We defined respiratory diseases as disorders that affect the respiratory system and included airway diseases such as Asthma, Chronic Obstructive Airway Diseases (COPD), infectious diseases such as pneumonia, tuberculosis, and tumors affecting the lungs such as lung cancers etc.

Variables of interest

We manually extracted variables of interest for all the cases that met our inclusion criteria from the ward records using a structured proforma. These included: Age, sex, diagnoses, duration of hospital stay, outcome (discharged, discharged against medical advice (DAMA) or died)

For cases that re-presented, each admission was documented as a separate presentation. All the cases with upper respiratory tract infection were observed to be having accompanying severe malaria which accounted for the reason for admission.

Statistical analysis

The data obtained was analyzed using SPSS version 21. Descriptive statistics (including summary statistics and ratios) were presented using frequency tables and bar charts. Case specific mortality was also computed for selected respiratory diseases.

Ethical clearance

Ethical clearance was obtained from the ethical committee of the hospital with reference number FMC/OW/380/VOL.XX/61.

Results

General characteristics

A total number of 502 respiratory cases were seen during the study period. This was out of the 5113 patients that were admitted into the medical wards during the study period, making respiratory disease to account for 10.2% of the total admission during the study period. As shown in Table 1, over half (54%) of the patients were males and one third of them were in the 25-44 years age group. Less than 10% of the patients were 24 years and below, while one quarter of the patients were aged 65 years and above with over 60% of the elderly being males.

Table 1: Age and Sex distribution of the patients admitted with Respiratory diseases N=502.

Age range (Years)	Male-N_1 (%)	Female-N_2 (%)	Total- N (%)
< 25	21 (44.7)	26 (55.3)	47 (9.4)
25-44	90 (48.4)	96 (51.6)	186 (37.1)
45-64	79 (55.2)	64 (44.8)	143 (28.4)
65+	80 (63.5)	46 (36.5)	126 (25.1)
Total	270 (53.8)	232 (46.2)	502 (100)

Distribution of the respiratory causes of admission

As shown in Table 2, Pulmonary tuberculosis constituted over half of all respiratory diseases seen among the patients (266;53%). HIV co-infection was observed in 88 (33%) of the patients with diagnosis of tuberculosis. Pulmonary TB, Pneumonia and COPD, were the top three prevailing respiratory diseases among in-patients at FMC, Owo.

Table 2: Respiratory diseases seen among medical in-patients N=502.

Disease	Number	Percent (%)
Pulmonary TB	178	35.5
PTB Co-infected with HIV	88	17.5
Pneumonias	106	21.1
COPD	69	13.7
Bronchial Asthma	42	8.4
Bronchogenic Carcinoma	7	1.4
Pleural Effusion	6	1.2
Upper respiratory tract infection (URTI)	5	1
Lung abscess	1	0.2
	502	100%

Nearly one-quarter (106; 21.1%) of the patients had any form pneumonias with community acquired pneumonia (defined by clinical presentation and corresponding radiological finding of consolidation) occurring in over 75% of the patients with pneumonia.

COPD was documented as the diagnosis in 13.7% of the patients. Bronchial asthma, bronchogenic carcinoma, pleural effusion, upper respiratory tract infection (URTI) and lung abscess (42 ,7,6,5,1;8.4%,1.4%,1.2%,1.0%,0.2%) were other respiratory conditions that were documented.

Length of hospital stay

Table 3 showed the distribution of patients by disease type and duration of admission. Tuberculosis was the commonest disease accounting the longest hospital stay. Twelve patients had over 28 days of admission on account of TB.

All the patients with upper respiratory tract infection, most of the patients with asthma and pneumonia and about half of those with pulmonary TB and bronchogenic carcinoma were usually

Table 3: Distribution of patients by disease type and duration of admission N=502.

Disease Type	Duration of Hospital Admission (In days)					
	1-7	8-14	15-21	22-27	≥28	Total –N
PTB	164	51	30	9	12	266
Pneumonia	74	24	5	2	1	106
COPD	42	17	5	1	4	69
Asthma	37	4	0	0	1	42
Bronchogenic CA	5	0	1	0	1	7
Pleural Effusion	1	3	0	0	2	6
URTI	5	0	0	0	0	5
Lung abscess	1	0	0	0	0	1

Table 4: Distribution of patients by disease type and outcome N=502.

Disease Type	Hospital Care Outcome N (%)					Total N (%)
	Discharged	Died	Referred	DAMA	Absconded	
PTB	153 (57.5)	65 (24.4)	14 (5.3)	34 (12.8)	0 (0.0)	266 (53.0)
Pneumonia	75 (70.8)	17 (16.0)	1 (0.9)	12 (11.4)	1 (0.9)	106 (21.1)
COPD	46 (66.7)	14 (20.3)	1 (1.4)	8 (11.6)	0 (0.0)	69 (13.7)
Asthma	38 (90.5)	3 (7.1)	0 (0.0)	1 (2.4)	0 (0.0)	42 (8.4)
Bronchogenic CA	1 (14.3)	4 (57.1)	2 (28.6)	0 (0.0)	0 (0.0)	7 (1.4)
Pleural Effusion	5 (83.3)	1 (16.7)	0 (0.0)	0 (0.0)	0 (0.0)	6 (1.2)
URTI	3 (60.0)	1 (20.0)	0 (0.0)	1 (20.0)	0 (0.0)	5 (1.0)
Lung abscess	1 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.2)
Total	322 (64.1)	105 (20.9)	18 (3.6)	56 (11.1)	1 (0.3)	502 (100)

DAMA- Discharged Against Medical Advice

hospitalized for under 7 days but PTB, COPD and Pneumonia was the major causes of long hospital stay of 2-3 weeks).

Disease outcomes

Mortality was highest for bronchogenic carcinoma (57.1%) and lowest for asthma (7.1%) as shown in Table 4. Three hundred and twenty two, 322(64.2%) representing approximately two-thirds of the patients were managed and discharged from the hospital. One hundred and five, (105; 20.9%) of the patients died while in the hospital with bronchogenic carcinoma having the highest mortality, (57.1% of all mortalities). Mortality attributable to pulmonary TB, COPD and pneumonia were 24.4%, 20.3% and 16.0% respectively. Pleural effusion and bronchial asthma had the lowest case-specific mortality.

Referral rate was highest among patients with bronchogenic carcinoma (28.6%), followed by patients with pulmonary TB (5.3%), while 12.8% of the patients with PTB discharged themselves against medical advice. Only one patient absconded from the hospital

Distribution of the respiratory diseases according to gender and age

As shown in Figure 1, twice as many females as compared to males had bronchial asthma while about twice as much males compared with females had COPD and bronchogenic carcinoma. Gender distribution was nearly the same for tuberculosis and pneumonia. Of those that had bronchogenic carcinoma, thrice as much males compared with females had the disease.

Figure 2 shows that Pulmonary TB and asthma were commonest in the 25-44 years age group while COPD and bronchogenic carcinoma occurred more in the elderly (65 years and above). Pneumonia was distributed almost evenly among the upper

three age groups. Asthma occurred typically in the younger patients. URTI was commoner in females.
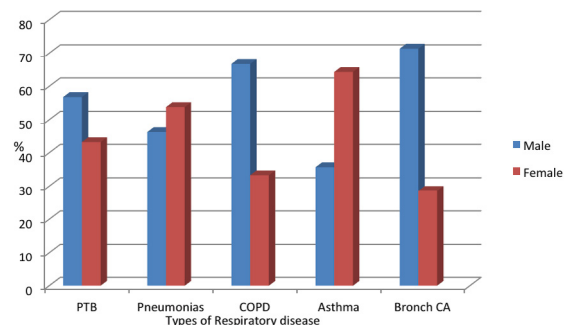
Figure 1: Gender distribution of the top five respiratory diseases.
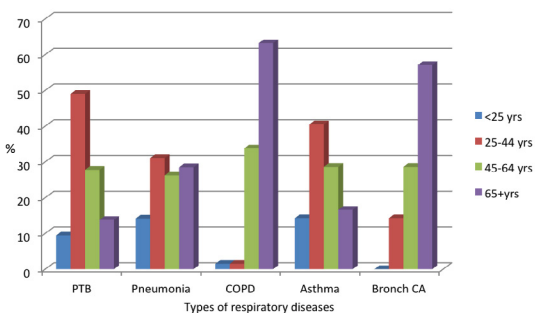
Figure 2: Distribution of the top five respiratory diseases by age group.

Discussion

Distribution of causes of respiratory diseases admissions

The study showed that communicable diseases especially Tuberculosis remain the commonest cause of respiratory admissions in our hospital. In this study TB accounted for 53.2% of all respiratory hospital admissions. This is similar to studies by Umoh et al. in South East and Desalu in South West Nigeria

in which TB accounted for 66.8% and 42.1% respectively of all respiratory disease-related morbidity. [27,28].

HIV co-infection with TB was also common (33%) in this study. In Jos North Central Nigeria, 45% of HIV patients admitted in medical wards in a tertiary hospital had TB. [29]. This study agrees with what is generally known about TB as the commonest pulmonary infection in persons with HIV/AIDS. Nigeria currently is among the 22 countries with the highest TB burden in the world. [30].

Pneumonia was also another common disease in our patients. It accounted for 21.1% of all the respiratory disease cases, with community acquired pneumonia being the commonest mode of presentation. In the study by Desalu et al. pneumonia was responsible for 34.5% of emergency admissions due to respiratory diseases.28 However the etiology of the pneumonia were not investigated in both studies. This is a gap that future studies need to address as data on this is almost non -existent in Nigeria. In a study in Zaria, Northern Nigeria in 1979, among 74 adults with pneumonia, 50% were positive for pneumococcal polysaccharide and 16.2% had Mycoplasma pneumonia. [31].

Chronic obstructive pulmonary disease (COPD) was the 3rd leading cause of respiratory disease hospitalization in this study accounting for 13.7%. Desalu reported admission due to acute exacerbation of COPD of 10.3%, while Umoh did not report it in their study. [27,28]. Men above 65years were most commonly affected in our study. The commonest risk factor for COPD globally is cigarette smoking.7 This habit though not as prevalent in Nigeria when compared to western countries, however more males still smoke when compared to females as reported by the Global Adult Tobacco Survey for Nigeria. [32]. Other risk factors like biomass and particulate matter exposure may be more relevant in our environment. [33]. This is however more likely to be a risk factor for women in Nigeria, many of whom cook in poorly ventilated kitchen with firewood.

Of the non-infectious causes of respiratory diseases admitted in this study, bronchial asthma constituted 8.4%. Other non –infectious conditions like bronchogenic carcinoma did not feature prominently in this study. However this does not make these diseases less important. Similarly, we observed that there was no single case of interstitial lung disease or occupational lung disease like sarcoidosis or pneumoconiosis. The unavailability of diagnostic equipment and low index of suspicion for these diseases might have contributed to some of these diseases being misdiagnosed or missed out altogether. [34]. In addition, our population has a poor health seeking behavior. [35]. Many patients often seek the services of traditional alternative practitioners before presenting to the hospital.

Respiratory diseases have significant negative impact on the economy of individuals and communities. For example, TB can lead to a loss of three to four months of work time and of 20-30% of the annual household income and, if the patient dies of TB, an average of 15 years of lost income. [36]. In addition, the age brackets 25 to 64years (most economically productive) were most affected. Umoh and Desalu reported similar trends in their studies. [27,28]. Moreover, about 90% of TB cases and TB-related deaths occur in the developing world, 75% of those cases occurring in the most economically productive age bracket (15-54 years). [36].

Length of hospital stay

In this present study, the average length of stay on admission was Two weeks for TB patients while other respiratory conditions stayed for less than a week. About 12% of the TB patients also discharged against medical advice probably due to lack of funds to sustain their hospital admission and pay other bills. Those with upper respiratory tract infections and asthmatics have shorter length of stay. Various reasons could be stated for the varying length of stay among the different diseases. The asthmatics who were possibly admitted for acute severe asthma majority of whom responded to steroid and short acting bronchodilators would be expected to have a short stay. Steroid use in acute asthma, has been documented to be effective in reducing hospital stay. [37]. All the patients with acute severe had steroid in form of intravenous or oral steroid. Most patients with PTB might have presented with complications like respiratory failure or super-imposed bacterial infection, which may extend their hospital stay before being discharged to continue care at the closest DOTS center after initial commencement of treatment. [28].

Although it appears that length of stay for patient with lung cancers appears short, this may be a reflection of early referral to more advanced centers for further management and possibly late presentation resulting in mortality.

Disease outcomes

Mortality from respiratory diseases is substantial. In our study, 102, (20.9%) of all patients admitted for respiratory diseases died. Specific case mortality for bronchogenic Carcinoma was highest (57.1%), followed by PTB 24.4% and COPD 20.6%. Our observation on mortality is similar to a report by Salako and Sholeye in Sagamu, South-West, Nigeria. In their study 23.2% of patients hospitalized for tuberculosis died. [38].

Contribution of respiratory diseases to medical ward admissions

The contribution of respiratory diseases to medical ward admissions in our study was remarkable. Approximately 10% of all cases admitted into the medical ward during the study were from respiratory diseases. In a study conducted at FMC, Asaba, Tuberculosis and Asthma contributed almost 4% of the medical admissions over a 2-year period. [39]. This highlighted the need to intensify the development of capacities in the management of respiratory diseases.

Limitations

This was a retrospective study and has inherent limitations, such as incomplete medical records, missing data and lack of essential, specific diagnostic facilities. Despite these limitations, the study has been able to highlight the high burden of respiratory diseases in our hospital and the role of tuberculosis and pneumonia as a major contributor to morbidity and mortality.

Conclusion

We concluded that respiratory diseases especially Tuberculosis

remains an important cause of respiratory admissions and hospital deaths in our study. HIV/TB co-infection is also an important contributor to mortality of respiratory diseases. We found a low incidence of lung cancers and no documentation of interstitial lung diseases. Although our study is hospital-based, it is possible that other regions with similar disease pattern may possibly show similar findings; this however remains to be validated by further research that is more comprehensive and cuts across various regions in the country.

There is need to intensify actions towards preventive measures in order to mitigate the burden of communicable respiratory diseases and to strengthen human capacities and diagnostic facilities for the detection of supposedly uncommon diseases which might have been hitherto missed.

Acknowledgement

Authors' contributions

• Adeniyi B- conceptualize the study, literature review and discussion

• Awokola B- performed the analysis

• Irabor I- literature review

• Obaseki D- intellectual content

• Ayeni E.-data collection

• Alele B.-data collection

• Erhabor G- definition of intellectual content and Mentorship throughout the conduct of the work

Conflict of Interest

All authors disclose that there was no conflict of interest.

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