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Research Paper

PATTERN AND OUTCOMES OF ADMISSION OF PATIENTS WITH RESPIRATORY DISEASES SEEN AT THE EMERGENCY UNIT OF A TERTIARY HOSPITAL IN SOUTHERN NIGERIA

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Abstract

Background: Respiratory diseases are an important cause of morbidity and mortality worldwide. This study was carried out to investigate the pattern and outcome of admission of patients with respiratory diseases seen at the emergency unit of University of Benin Teaching Hospital (UBTH), Benin City, Nigeria. **Methods**: A two year study was carried out, data was retrieved using a structured pro forma to include the date patient was seen, age, sex, diagnosis and outcome of presentation after 72hours. **Results**: A total of 5965 cases were seen in the medical emergency during the study period with 1015 (17%) patients presenting with respiratory diseases. The commonest respiratory condition requiring medical attention was pneumonia (45.3%) and was mostly present between ages 60-69 years. Seven hundred and forty (72.9%) cases of respiratory conditions resulted in admission of patients with majority of such cases being due to pneumonia. One hundred and eleven (10.9%) cases of patients with respiratory conditions resulted in the death of patients. Patients between ages 60 and 69 years showed the highest mortality rate (14.5%) while patients between 10 and 19 years showed the least mortality rate (0%). **Conclusion**: Measures to reduce the burden of pneumonia, especially the administration of pneumococcal and influenza vaccines should be instituted.

Key words: pneumonia, respiratory disease, outcome, emergency.

INTRODUCTION

The respiratory tract, extending from the nose to the lungs is responsible for gas exchange and thus in contact with the external environment. It is therefore prone to several airborne irritants and infectious agents. Respiratory diseases are an important

cause of morbidity and mortality worldwide. They account for more than 10% of all disability- adjusted life years, which is a measure of years of healthy life lost to premature death and disability (1). Worldwide, lower respiratory tract infections are the 4th leading cause of death, Chronic Obstructive Pulmonary Disease (COPD) is the 7th leading cause of death while tuberculosis is the 11th leading cause of death (2). COPD exacerbation exerts a huge burden on the health care system, financially and otherwise; and the frequency of exacerbations is a predictor of deterioration (3). Asthma is known to affect up to 300 million people worldwide, and 2-10% of asthmatics have some form of "severe", "uncontrolled", "difficult to treat" or "refractory asthma" which necessitates frequent emergency room visits (4).

In Nigeria, few studies have been done to show the pattern of respiratory cases presenting in emergency units (5,6,7). However, it is necessary to continue to carry out studies of this nature in several settings in order to establish a national epidemiological pattern of respiratory emergencies and adequately provide the necessary facilities for patient care. Our study will help to identify common respiratory emergency cases seen at our hospital with the aim of establishing the possible reasons for the pattern observed.

MATERIALS AND METHODS

The study was carried out at the Accident and Emergency Unit of the University of Benin Teaching Hospital, Edo State, Nigeria. Records of adult patients who presented with respiratory emergencies at the medical emergency department over a two year period from January 1st 2016- December 31st 2018 were reviewed. Data was retrieved using a structured pro forma to include the date patient was seen, age, sex, diagnosis, time of the year the patient was seen (rainy or dry season) and outcome of presentation after 72hours. Mean and standard deviation were used to summarize age.

ETHICAL APPROVAL

This was obtained from the Research and Ethics Committee of the University of Benin Teaching Hospital, with protocol number ADM/E 22/A/VOL.VII/1477. The ethical principle of confidentiality was strictly maintained. There was no reference to patient names or identity at any point in the study.

RESULTS

A total of 5965 cases were seen in the medical emergency from January 1st 2016 to December 31st 2018. Of this number, 1015 were respiratory conditions, which accounted for 17.0% of the total medical emergency hospital visits. The mean age was 53.98 ± 19.31 years with a range from 10-99 years. The highest age group were those 60-69 years of age (n = 173), accounting for 17% of cases. There were slightly more females than males in the study, with a ratio of 1.05:1 (Table 1).

The commonest respiratory condition requiring medical attention in the period under review was pneumonia (45.3%) and was mostly present in the age 60-69 years. Also, tuberculosis and acute severe asthma was commoner in the age group 20-29 years and 40-49 years with 24.5% and 29.3% prevalence respectively (Table 2).

Seven hundred and forty (72.9%) cases of respiratory conditions resulted in admission of patients with majority of pneumonia cases leading to admission. Among the 460 cases of Pneumonia, there were 54 deaths, giving a mortality rate of 11.7% within 72 hours of presentation. High mortality rates were also recorded among cases presenting with Aspiration pneumonitis (34.7%) and Pulmonary Embolism (33.3%). (Table 3)

The admission rate was fairly evenly spread among all ages although the highest rate (80%) was seen between ages 20 and 29. Patients between ages 60 and 69 years showed the highest mortality rate (14.5%) while patients between 10 and 19 years showed the least mortality rate (0%). (Table 4).

Table I: Distribution of patients with respiratory conditions in relation to age and sex

	FREQUENCY (%)
Age	
10-19	14 (1.4)
20-29	110 (10.8)
30-39	157 (15.5)
40-49	164 (16.2)
50-59	135 (13.3)
60-69	173 (17)
70-79	155 (15.3)
80-89	90 (8.9)
> 90	17 (1.7)
Gender	
Male	494 (48.7)
Female	521 (51.3)

Table II: Distribution of patients with respiratory conditions in relation to age and diagnosis

	FREQUENCY	A	B	C	D	E	F	G	H	I	J	K
10-19	14	0	2 (14.3)	6 (42.9)	0	3 (21.4)	0	0	1 (7.1)	0	0	2 (14.3)
20-29	110	2 (1.8)	31 (28.2)	33 (30)	0	27 (24.5)	2 (1.8)	5 (4.5)	7 (6.4)	0	1 (0.9)	2 (1.8)
30-39	157	6 (3.9)	46 (29.3)	58 (36.9)	0	26 (16.6)	4 (2.5)	4 (2.5)	5 (3.2)	0	1 (0.6)	7 (4.5)
40-49	164	4 (2.4)	48 (29.3)	56 (34.1)	5 (3.0)	12 (7.3)	19 (11.6)	4 (2.4)	2 (1.2)	9 (5.5)	2 (1.2)	3 (1.8)
50-59	135	6 (4.4)	27 (20)	65 (48.1)	5 (3.7)	15 (11.1)	9 (6.7)	0	4 (3.0)	1 (0.7)	2 (1.5)	1 (0.7)
60-69	173	3 (1.7)	20 (11.6)	97 (56.1)	17 (9.8)	8 (4.6)	16 (9.2)	0	4 (2.3)	1 (0.6)	2 (1.2)	5 (2.9)
70-79	155	1 (0.6)	1 (0.6)	87 (56.1)	26 (16.8)	13 (8.4)	18 (11.6)	0	3 (1.9)	1 (0.6)	1 (0.6)	4 (2.6)
80-89	90	1 (1.1)	4 (4.4)	51 (56.7)	14 (15.6)	13 (14.4)	3 (3.3)	0	2 (2.2)	0	0	2 (2.2)
> 90	17	1 (5.9)	1 (5.9)	7 (41.2)	3 (17.6)	0	1 (5.9)	0	2 (11.8)	0	0	2 (11.8)
TOTAL	1015	24 (2.4)	180 (17.7)	460 (45.3)	70 (6.9)	117 (11.5)	72 (7.1)	13 (1.3)	30 (3.0)	12 (1.2)	9 (0.9)	28 (2.8)

A – Pleural effusion; B – Tuberculosis; C – Pneumonia; D – AECOAD; E – Acute Severe Asthma; F – Aspiration pneumonitis; G – Acute chest syndrome; H – Upper Respiratory Tract Infection; I – Pulmonary embolism; J – Lung malignancy; K – Others (Bronchiectasis, Spontaneous pneumothorax, Retropharyngeal abscess, Acute Bronchitis, Allergic Rhinitis), number in brackets = value in percentages

Table III: Diagnosis and outcomes of patients with respiratory conditions

Diagnosis	**Frequency**	**Admitted**	**Discharged**	**Died**	**DAMA**	**ICU**	**Referred**
Plural effusion	24	23 (95.8)	1 (4.2)	0	0	0	0
TB	180	148(82.2)	12 (6.7)	17(9.4)	2 (1.2)	0	1(1.1)
Pneumonia	460	341(74.1)	58(12.6)	54(11.7)	5 (1.1)	2(0.4)	0
AECOAD	70	54 (77.1)	10 (14.3)	5 (7.1)	1 (1.4)	0	0
ASA	117	65 (55.6)	49 (41.9)	2 (1.7)	1 (0.9)	0	0
Aspiration Pneumonitis	72	41 (56.9)	5 (6.9)	25(34.7)	0	1(1.4)	0
Acute chest syndrome	13	11 (84.6)	0	2 (15.4)	0	0	0
URTI	30	20 (66.7)	9 (30)	0	1(3.3)	0	0
Pulmonary embolism	12	7(58.3)	0	4(33.3)	1(8.3)	0	0
Lung malignancy	9	8(88.9)	0	1(11.1)	0	0	0
Other	28	22 (78.6)	3 (10.7)	1(3.6)	2 (7.1)	0	0
Total	1015	740 (72.9)	147 (14.5)	111 (10.9)	13 (1.3)	3 (0.3)	1 (0.1)

DAMA- Discharged Against Medical Advice, ICU-Intensive care unit, AECOAD- Acute exacerbation of chronic obstructive airway disease, ASA- Acute severe asthma, URTI- Upper respiratory tract infection, number in brackets = value in percentages.

Table 4: Outcomes of respiratory conditions in relation to age

	FREQUENCY	Admitted	Discharged	Died	DAMA	ICU	Referred
10-19	14	10 (71.4)	4 (28.6)	0	0	0	0
20-29	110	88 (80)	15 (13.6)	4 (3.6)	3 (2.7)	0	0
30-39	157	116 (73.9)	28 (17.8)	12 (7.6)	1 (0.6)	0	0
40-49	164	124 (75.6)	15 (9.1)	22 (13.4)	2 (1.2)	0	0
50-59	135	92 (68.1)	22 (16.3)	19 (14.1)	1 (0.7)	1 (0.7)	1 (0.7)
60-69	173	123 (71.1)	23 (13.3)	25 (14.5)	2 (1.2)	0	0
70-79	155	113 (72.9)	22 (14.2)	17 (11.0)	2 (1.3)	0	0
80-89	90	63 (70)	13 (14.4)	12 (13.3)	1 (1.1)	0	0
> 90	17	11 (64.7)	5 (29.4)	0	1 (5.9)	0	0
TOTAL	1015	740	147	111	13	1	1

DAMA- Discharged against medical advice, ICU-Intensive care unit, number in brackets = value in percentages.

DISCUSSION

This study was aimed at determining the pattern and outcome of respiratory cases presenting at the medical emergency unit of our facility and has helped us describe the burden of respiratory disorders in this setting.

From this study, we found that respiratory cases made up 17.9% of the cases presenting at the medical emergency over the period. This is higher than the 5.4% reported in Owo[5], 9.3% reported in Calabar and 10.2% reported at Ido- Ekiti (6, 7). It is however comparable to 14.5% reported in Saudi Arabia (11). The high rate of respiratory conditions in this study may be related to the exclusion of surgical cases as the study was done in a medical emergency unit. It may also reflect an increase in the risk factors associated with respiratory disease, particularly environmental pollution which is commoner in urban areas particularly in developing countries (12).

Our study revealed a slightly higher female preponderance with female to male ratio of 1.05:1 which is in contrast with other studies (5, 6. 7, 8, 11). Although other studies have reported a male dominance, the female preponderance seen in our study may be due to the fact a study has shown that women are more likely to visit a physician than men for similar complains (13).

The commonest cause of respiratory emergency presentation from this study was pneumonia, accounting for 45.3% of cases. This was followed by tuberculosis (17.7%), Acute severe asthma (11.5%) and aspiration pneumonitis (7.1%). The findings are similar to that reported in Ido- Ekiti (7). Tuberculosis was also the commonest presentation in Owo and Calabar (5,6). In Saudi Arabia (11), the commonest presentation was reported to be acute severe asthma; while in India (8), it was reported to be COPD. Acute lower respiratory tract infection, which includes pneumonia; and tuberculosis have been reported to be the 4th and 11th leading causes of death worldwide respectively while COPD has been reported to be the 7th cause (2). The geographical variations noted with the diagnosis reflect the prevailing risk factors present in the population where the study was carried out. The high rate of pneumonia in this study is due to the fact that pneumonia is an important cause of morbidity and mortality in Nigeria (14,15), and identified risk factors include tobacco smoking, recent upper respiratory tract infections and anemia, previous pneumonia, malnutrition, overcrowding and HIV infection (16).

The high rate of tuberculosis in our study is in keeping with the high morbidity of tuberculosis in Nigeria. At the end of 2017, Nigeria had the 6th highest burden of tuberculosis worldwide, and the highest in Africa. Risk factors for tuberculosis infection include HIV infection, tobacco smoking, low socioeconomic status, overcrowding and immunosuppressive states which include HIV infection, diabetes mellitus and use of corticosteroids (17).

Pneumonia was commonest among the age group > 60 years of age, with 54.3% of all patients with pneumonia belonging to this age group in this study. This finding is similar to the study done in Kano (18), but in contrast with studies from Calabar and Ethiopia in which pneumonia was said to be highest among the age groups 36-49 years and 30-44 years respectively (6, 19). The high rate of pneumonia among elderly

patients in our study confirms the report that advancing age is a risk factor for pneumonia (20, 21). Pneumonia has been reported as the leading infectious cause of death in the elderly due to changes in the structure and function and alteration of the immune mechanisms of the lungs, leading to reduced chest compliance and increased residual volume, as well as the presence of other co- morbidities such as heart failure, diabetes mellitus, liver disease and the presence of chronic exposure to airborne pollutants throughout their life time (20, 21).

Tuberculosis on the other hand, was found to be commonest in the younger age group. 56% of tuberculosis cases were in the age group 18-44. This finding is similar to studies from Enugu and Owo (22, 23). This could be because HIV infection, which is the most important risk factor for TB infection is also commoner in this age group (24). Also, young people are more active, hence they are more exposed to close contact with infected people, especially as a result of their working long hours in poorly ventilated work spaces.

Our study reported an all-cause mortality rate of 10.9% for respiratory diseases, which is similar to 9.2% reported in Calabar (6), lower than 4.8% reported in India[8] and 14.7% also reported in India (25). The highest causes of death were due to pneumonia (45%), followed by aspiration pneumonitis (22.5%), tuberculosis (15.3%), and AECOPD (4.5%). Eleven point seven percent of patients with pneumonia died in this study. This finding is higher than the mortality rate of 6.4% reported in Kano (18), and 7.4% reported in Calabar (6). It is however similar to 11.9% reported in Enugu (26). The deaths reported in this study were only those that occurred while patients were in the emergency room and not the outcome after admission in the medical ward.

Aspiration pneumonitis was a significant cause of death among patients in this study, with a mortality rate of 34.7%. 50% of patients with aspiration pneumonitis were >60 years of age, which makes it an important cause of mortality among older persons. Other studies did not include aspiration pneumonitis. However, it has been reported to be common among elderly patients, and risk factors include neurologic deficits including stroke and other causes of gastric aspiration (27). The high mortality reported in this study may be due to large volume aspiration associated with other comorbidities which may lead to acute respiratory distress syndrome (27).

Acute exacerbation of COPD was also an important cause of mortality in this study, being the 4th highest cause (7%) of death. This is much lower than 21.3% reported in India and higher than 3.7% reported in Ido- Ekiti (7, 25). An exacerbation of COPD refers to an acute worsening of respiratory symptoms that result in additional therapy (2). It has been previously reported that patients with COPD who are hospitalized for exacerbations have 4.3 times greater risk of death than those who do not, and this risk is even higher with subsequent hospitalizations (28).

This study was retrospective in nature, hence the possibility of errors in diagnosis. Also, the limitation of facilities for proper diagnosis in some cases may have led to wrong diagnosis. There is the possibility of differential misclassification bias since diagnoses of respiratory disorders are made by different cadre of respiratory physicians.

CONCLUSION

Respiratory diseases, especially pneumonia and tuberculosis, constitute a major burden of respiratory admissions and are an important cause of morbidity and mortality in our hospital setting. Measures to reduce the burden of pneumonia, especially the administration of pneumococcal and influenza vaccines should be instituted.

FINANCIAL SUPPORT

The financial cost of the study was borne by the researchers. There was no external funding for the study.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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