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ORIGINAL ARTICLE

PROFILE AND RISK FACTORS OF PATIENTS WITH OBSTRUCTIVE AIRWAY DISEASES AT TIKUR ANBESSA SPECIALIZED HOSPITAL CHEST CLINIC, ADDIS ABABA, ETHIOPIA

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ABSTRACT

Introduction: Obstructive airway diseases are major causes of morbidity and mortality worldwide. There are limited published data describing the characteristics and risk factors for chronic obstructive pulmonary disease and asthma in Ethiopia. Understanding the characteristics of these patients and identifying risk factors are important first steps in developing effective interventions and future research. Therefore, the purpose of this study was to characterize and identify the risk factors of patients with obstructive airway diseases at Tikur Anbessa Specialized Hospital chest clinic, in Addis Ababa, Ethiopia.

Methods: A retrospective, cross-sectional review of patients seen at TASH chest clinic, between January 2013-December 2013, was performed. All adult patients with a physician diagnosis of obstructive airway diseases were identified and their demographic and clinical data were included in the analysis.

Results: During the study period, there were 144 patients seen with a clinical diagnosis of obstructive airway disease; spirometry was obtained for 56% of the patients. Fifty six percent were females and 74.6% were from Addis Ababa. The mean age was 52.8±13.8 years. Only 16 were HIV positive. Among the participants, 26% and 27% had history of prior tuberculosis treatment, and prior pneumonia, respectively. A slight majority were high school and college educated (50.7%). Approximately 17% had ever smoked cigarettes, which was exclusively among men. Among patients who reported symptoms, 73%, 83%, and 75% presented with cough, wheezing and dyspnea respectively. Asthma was the primary diagnosis among 86% of patients; the remainder carried a diagnosis of chronic obstructive pulmonary disease. Among those who had spirometry, 55.8% of asthmatics and 63.6 % of chronic obstructive pulmonary disease had an obstructive ventilatory defect. Among chronic obstructive pulmonary disease patients, 40% were ever smokers, and 40% were females.

Conclusions: The majority of patients with obstructive lung disease at Tikur Anbessa Specialized Hospital chest clinic are female, non-smoking asthmatics. Of those with spirometry, the majority demonstrated an obstructive ventilatory defect. Other risk factors, such as exposure to indoor and/or outdoor air pollution are likely contributing to these findings. Future study will incorporate bronchodilator and/or bronchoprovocative testing to improve accuracy of disease diagnosis, and will use a broader study population to improve representativeness.

Key words: Obstructive airway disease, Profile, risk factors, Ethiopia.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) and asthma are major causes of chronic morbidity and mortality worldwide and represents a substantial economic and social burden throughout the world, especially in low income countries (1,2). COPD preva-

lence and mortality are increasing in low and middle income countries (3-7); COPD is now the 3rd leading cause of mortality worldwide (4,5,7).

The diagnosis of both COPD and asthma require pulmonary function testing and pulmonary expertise often unavailable in the poorest regions. Under-diagnosis of COPD and inadequate treatment is

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known to predict increased mortality. In large surveys, non-smokers comprise up to 25 percent of the COPD burden; but very little is known about the characteristics and risk factors for COPD in non-smokers, and there are limited data in general for COPD in Africa (8-12). Risk factors identified for asthma in sub-Saharan Africa include the main allergens in the region, house dusts mites, cockroaches, and cat and dog dander. Overall, the impact, risk factors and characteristics of COPD and asthma have not been well studied in developing countries, notably sub-Saharan Africa and Ethiopia.

Identifying risk factors for COPD and asthma are important first steps in developing effective interventions and as a basis for future studies. The purpose of this study is to identify risk factors and characteristics of these common airway diseases seen in the outpatient Chest Clinic of Tikur Anbessa Specialized Hospital (TASH), chest clinic, Addis Ababa, Ethiopia.

PATIENTS AND METHODS

The design of the study was a retrospective cross sectional review of all patients seen at the Chest Clinic of TASH from January to December 2013. All adult patients (≥ 18 years) who were diagnosed with obstructive airway diseases (COPD or asthma) by the treating physician were included into the study.

Data was collected by trained physicians using a pre-tested standardized questionnaire. The questionnaire was pretested using 10 patient records for clarity, flow, repetitions and time requirement on data. Findings and experiences from the pre-test were utilized in modifying the data collection tools.

The following variables were collected: age, gender, place of residence, education level, occupation, socio demographics, history of cigarette smoking, previous diagnosis of respiratory diseases (i.e., previous diagnosis of TB, pneumonia, HIV, asthma), biomass exposure and symptoms of respiratory diseases. Data was entered into the computer by trained personnel. Participants with incomplete data are excluded from the study. Permission from the hospital medical director was obtained.

COPD and asthma were defined as a physician diagnosis of the diseases. Spirometry, following American Thoracic Society (ATS) standards and using an NDD Easy One device, was used to confirm airflow obstruction as defined by an FEV/FVC ratio < 0.7 .

Statistical Analysis: Data obtained was entered into Excel and Statistical Package for Social Sciences (SPSS) 19, statistical software for analysis. Descriptive statistics were reported as mean with standard deviation (SD) for normally distributed variables and median for variables not normally distributed. Simple frequency tables were tabulated. Categorical data was presented as percentages with 95% confidence intervals (CI) when appropriate. The Chi Square test was used to determine associations between variables. Relative risk with 95% CI was also calculated. The level of statistical significance was set at $P < 0.05$ and all P values in this study were two sided.

Quality Control: Trained pulmonary critical care fellows collected all data. The Principle Investigator supervised data quality control by checking for correct collection of all data and completeness of the questionnaire. Trained clinical nurses under the supervision of the pulmonary fellows performed all spirometric testing.

Ethical clearance: The study was conducted after obtaining ethical clearance from the Department of Internal Medicine, Ethics and Research Committee and Addis Ababa University Institutional Review Board. Data was collected with strict adherence to the Questionnaire form. Other confidential material in the patient's chart was kept secret. Permission for access of clinical data of the patients from the clinic record office was requested and allowed. The study was conducted under the basic principles of ethics. Safekeeping of data and confidentiality of participant information was ensured.

RESULTS

Among all patients seen at the chest clinic during the one year study period, there were 144 patients with COPD and asthma as determined by physician diagnosis. In fact, airway diseases were the most common reason for a visit to the Chest Clinic (20.5% of the total 700 visits from unpublished data). The mean age of the participants was 52.8 ± 14 years. The most common age group affected by both diseases was 41-65 years of age (Table 1). Those with airflow obstruction were more often female (56% female versus 44% male) (Table 1).

In addition, those with airflow obstruction were more often employed (54.2% employed), high school and college educated (50.7%), and residents of Addis Ababa, the capital city (74.6%) (Table 2).

Table 1. Age distribution of patients with obstructive airway disease, Tikur Anbessa Teaching Hospital, January - December 2013, Addis Ababa, Ethiopia,

Variable	Asthma N (%)	COPD N (%)	Total N (%)
Age in years			
18-30	10 (8.0)	0 (0)	10 (7)
31-40	24 (19.3)	2 (10)	26 (18)
41-65	70 (56.4)	12 (60)	82 (57)
>65	19 (15.3)	6 (30)	25 (18)
Total	124 (100)	20 (100)	144 (100)
Mean age			
52.8± 13.8 SD			
Gender			
Male	52 (41.9)	12 (60)	64 (44.4)
Female	72 (58.1)	8 (40)	80 (55.6)
Total	124 (100)	20 (100)	144 (100)

Table 2. Socio demographic characteristics of patients with obstructive airway disease, Tikur Anbessa Teaching Hospital, January - December 2013, Addis Ababa, Ethiopia

Variable	Asthma N (%)	COPD N (%)	Total N (%)
Socioeconomic			
Unemployed	56 (45)	10 (50)	66 (45.8)
Factory	3 (2.0)	0(0)	3(2.0)
Office work	23 (18.5)	2(10)	25 (17.3)
Farmer	6 (5.0)	1(5)	7(5.0)
Other	36 (29.5)	7(35)	43 (29.9)
Total	124(100)	20 (100)	144 (100)
Education level			
Less than high school	57 (46)	14(70)	71 (49.3)
High school	27 (21.7)	6(30)	33 (22.9)
College and above	40 (32.3)	0(0)	40 (27.8)
Total	124(100)	20(100)	144(100)
Residence			
Addis Ababa	92 (74)	15(75)	107(74.3)
Out of Addis Ababa	32(26)	5(25)	37(25.7)
Total	124 (100)	20(100)	144(100)

Among all the participants, only 16 (11.1%) were HIV positive and 25.7% and 27.0% had a prior history of tuberculosis treatment and pneumonia, respectively. Almost 17% had ever smoked cigarettes among the participants and 53% had been exposed to cook stove biomass fuel (Table 3).

Most patients reported respiratory symptoms; 73%, 83%, and 75% presented with cough, wheezing and dyspnea respectively. Spirometric measurements were determined for 55.6% of the patients. Among those with spirometric measurements, 58.7% had FEV1/FVC ratio of <0.7, suggestive of obstructive airways disease (Table 4.).

Table 3: Risk factors for airways disease among patients seen at Tikur Anbessa Teaching Hospital, January—December 2013, Addis Ababa, Ethiopia

Variable	Asthma N (%)	COPD N (%)	Total N(%)
Cigarette smoking			
Ever smokers	16 (12.9)	8 (40.0)	24(16.7)
(Current smoker)	2 (1.6)	1 (5.0)	3 (2.1)
Never smokers	108(87.1)	12(60.0)	120(83.3)
Cooking with biomass			
Never exposed	57(46)	11(55)	68(47)
Ever exposed	67(54)	9(45)	76(53)

Table 4. Spirometric findings among the patients for whom spirometry was performed Tikur Anbessa Teaching Hospital, January—December 2013, Addis Ababa, Ethiopia

	COPD n=11)	Asthma n=69	Total n=80
Obstructive	6	44	50
Other	5	25	30

There were more asthmatics (n=124) than those with COPD (n=20) (86.1% versus 13.9%). Patients with asthma differed from those with COPD in several ways; they were younger (mean age 51.7±13.7 and 59.2±13.1 years for asthma and COPD respectively) and more often female (58.1% versus 40%), office workers (18.5% vs. 10%), high school or college educated (54% vs. 30%), never smokers (87.1% versus 60%) and ever exposed to cook stove biomass fuel (54% versus 45%) (Tables 1-3). In contrast then, those with COPD were older men with less education and greater personal smoking histories.

In addition, among those who performed spirometry, 55.8% of asthmatics and 63.6 % of COPD patients demonstrated an obstructive pattern.

DISCUSSION

In our small descriptive study of patients presenting to Chest Clinic at Tikur Anbessa Specialized Hospital, we found a significant number of airways disease as defined by a physician diagnosis of asthma or COPD. This is in agreement with other studies from sub-Saharan Africa (13). In addition, our results suggest that the prevalence of disease may be increasing as our numbers were greater than those reported from other Ethiopian hospitals in the past (14-18). A similar pattern of increased prevalence has been seen in other developing countries, especially in non-smokers (8-12,19). Improved diagnostic testing and

more universal definitions for airway disease could partially explain the rise in disease prevalence in African and specifically Ethiopia (14,16). However, aging of the population and an increase in cigarette smoking and indoor and outdoor air pollution may also be playing roles (8-12). Despite these findings, under diagnosis and under treatment of these conditions portend a greater health problem (13,21).

Most of our patients with airways disease had asthma rather than COPD. Asthmatics were best characterized as young women, who were nonsmokers with cook stove biomass fuel exposure. In contrast, those with COPD were more often older men with greater personal smoking histories. Also, those diagnosed with COPD had significant previous tuberculosis treatment, possibly predisposing them to fixed air-flow obstruction (20). Although not as great, those with COPD also had significant cook stove biomass fuel exposure and many were never cigarette smokers. Our study was not able to further determine risk factors for either asthma or COPD. These findings are similar to other studies describing those with asthma and COPD in developing countries (13).

There were several limitations in our study. Our numbers were relatively small to making significant comparisons difficult. We relied on a physician diagnosis of disease, possibly introducing diagnostic bias into our sample. Not all subjects underwent spirometry and none underwent bronchodilator or methacholine challenge testing. Our measure of exposure to biomass fuel was crude and did not take into account

actual indoor air pollution sampling. However, the agreement with other larger and better-designed trials from low-income countries is reassuring.

Conclusion: We have shown a high prevalence of airways disease in patients visiting a chest clinic in a large referral hospital in an urban city located in Ethiopia. The majority of patients with airways disease were female non-smoking asthmatics and fewer were male smoking patients with COPD. Of those with spirometry, the majority of both groups demonstrated an obstructive ventilatory pattern. Other risk factors, such as exposure to indoor and/or outdoor air pollution are likely contributing to these findings. Future study with use a broader study population to improve representativeness, incorporate bronchodilator and/or bronchoprovocative testing to improve accuracy of disease diagnosis, and collect more detailed measures of potential risk factors.

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