Original Article

Knowledge of Asthma among Doctors Practicing in Three South Eastern States of Nigeria

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Abstract

Background: Asthma is a chronic airway disease that has a significant impact on patients with substantial global socioeconomic burden. Appropriate knowledge by health care practitioners is important in the management of asthma. **Aim:** The aim was to assess the knowledge of asthma among doctors practicing in health care facilities in three South-Eastern states of Nigeria. **Subjects and Methods:** This was a descriptive cross-sectional study. The participants were selected using multi-staged sampling method and interviewed with structured, self-administered questionnaires. Comparison of the different outcome variables using the Chi-square (categorical) and Student's *t*-test (noncategorical) with the characteristics of the participants were done. **Result:** A total of 283 doctors were interviewed. Eighty-eight percent of them identified asthma as a common disease in our environment, ($P = 0.04$) but unrelated to socioeconomic status. Knowledge of epidemiology was poor among medical officers and registrars ($P = 0.04$). Most of the doctors (80%)(226/283) recognized the pathogenic significance of bronchospasm in exacerbation, while 58.6% (166/283) of them considered chronic inflammation as a significant factor in asthma pathogenesis $P < 0.001$. Majority of the doctors (84.1%) (238/283) were aware of the use of steroids in acute exacerbation, while 59.4% (168/283) considered aminophylline as the first line medication in exacerbation ($P = 0.02$). Knowledge about the use of steroids as controller medication was noted in 1.7% (5/283) of the respondents. Only 47.3% (134/283) of the participants were aware of the Global Initiative on Asthma guideline, ($P = 0.03$). **Conclusion:** There was good knowledge of epidemiology and clinical features of asthma, but a small number of the doctors had knowledge of pathophysiology and treatment of the disease. For best practices in asthma management, there is a need for further education.

Keywords: Asthma knowledge, Doctors, Nigeria, Southeast

Introduction

There has been a sharp increase in the global prevalence, morbidity, mortality, and socioeconomic burden associated with asthma over the last 40 years.[1] Approximately, 235 million people worldwide currently have asthma, and its prevalence increases by 50% every decade.[1,2] Prevalence is high (more than 10%) in developed countries, while in the developing countries there is reportedly increasing rate of prevalence as they become westernized in culture.[1,2] Asthma is underdiagnosed and undertreated, partly due to the variant knowledge and practice among health care providers in the different parts of the world.[2] Several studies have been conducted around the world to determine the level of knowledge of doctors about asthma. In the United States of America, Janson, and Weiss[3] showed that a significant number of doctors were unaware of the pathophysiology and treatment modules of asthma. In Europe,[4] there were differences in knowledge and practice, while in Taiwan[5] there was a significant gap in knowledge shown by different categories of doctors. In the African continent, Badoum *et al.*[6] and Hese[7] in Ghana found poor knowledge-base and practice among a large number of doctors in their respective countries. There are very few data on the knowledge of asthma by doctors in Nigeria, especially in the Southeastern part of the country.

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The aim of this study was therefore to assess the knowledge of asthma among doctors practicing in health facilities in three South-Eastern states of Nigeria, to identify any possible deficiency in knowledge in order to facilitate initiation of remedial measures to improve the management and subsequent reduction of asthma burden.

Subjects and Methods

Study design

This was a descriptive cross-sectional study in which participants were selected consecutively following multi-staged inter- and intra-institutional selection among the various health facilities. The study participants were drawn from a population of 1130 registered medical practitioners, (obtained from the register of the Nigerian Medical Association of the respective state branches) who were trained/being trained in Internal Medicine, Pediatrics and Family Medicine working in three cities across three states (Anambra, Ebonyi, and Enugu) in South-East Nigeria. Enugu is the capital city of Enugu state with a population of 712,664 inhabitants who are mainly civil servants. Abakaliki has 134,103 inhabitants made up of civil servants and farmers while Nnewi has 193,987 inhabitants who are predominantly business men and women.

Selection of participants and questionaire administration

Proportional distribution of the study questionnaire was used in order to ensure an equitable spread among the doctors in the various towns, institutions and cadres of doctors. The consenting participants were interviewed using pretested, self-administered questionnaires [Appendix 1], which contained questions on knowledge of epidemiology, pathology, diagnosis, classification, use of management tools and medication. Ethical clearance was obtained from the Health Research and Ethic Committee of the University of Nigeria Teaching Hospital Enugu before the commencement of the study, while an informed written consent was obtained from all participating doctors. The study lasted from August to December 2008.

Data management

The analysis of data was with SPSS version 17 (2007, Chicago IL, USA). Descriptive statistics were used to ascertain the mean and dispersion of the continuous variables such as age and years of practice. Comparative analytical tools such as cross-tabulations were used for categorical variable and years of experience were analyzed against the response variables on knowledge. Tests of significance (Chi-square or Fisher Exact) and "*t*"-test were used for the categorical and continuous outcome variables with a significant difference of 5% and $P < 0.05$.

Result

Characteristics of respondents

There were 283 respondents, which comprised of 63.3% (179/283) males and 36.7% (104/283) females. Of this number 61.1% (173/283) practiced in tertiary hospitals, while 38.9% (110/283) worked in non-tertiary health facilities, ($P = 0.001$) ($P < 0.01$). The proportion of the low cadre of medical doctors (registrars/senior house officer) was 62.9% (178/283); middle level cadre (senior registrars, principal medical officers) was 28.3% (80/283), while the high cadre made up of consultants was 8.8% (25/283) [Table 1]. The number of years of practice ranged from 1 to 35 years with a mean of 7.6 years.

Epidemiology of asthma

Eighty percent (226/283) of all participants were of the view that asthma was a common disease ($P = 0.04$) and 79.2% (224/283) were of the opinion that it occurred more in children compared with adults ($P = 0.24$). A majority of respondents, 74.6%, (211/283) was of the view that asthma was unrelated to socioeconomic status (SES) although 19% (5/26) of medical doctors who had practiced for more than 20 years were of the opinion that asthma was a disease of the rich.

Clinical features of asthma

The main clinical features of asthma; cough, wheezing and breathlessness were well-recognized by all the doctors interviewed. Chest tightness and chest pain were however, not recognized as symptoms of asthma by all categories of doctors irrespective of practice location and years of practice. In the tertiary facilities 78.6% (136/173) were not aware of chest tightness and 93.6% (162/173) were not aware of chest pain as symptoms of asthma. This view was prominent among the consultants in both facilities; 84% (21/25) and 96% (24/25) for chest tightness and chest pain, respectively. This pattern of knowledge persisted with increasing years of medical practice of respondents ($P = 0.05$).

Pathology

With regards to the role of bronchospasm in asthma exacerbation, 86.6% (245/283) of all the doctors were aware of the significance of this as a major pathological factor. In relation to their facility of practice, 16.2% (28/173) of doctors in tertiary hospitals and 21.8% (24/110) in non-tertiary hospitals were unaware of the role played by bronchospasm, ($P = 0.23$). There was also a significant knowledge deficiency with regards to the role of chronic inflammation as an important factor in the pathology of asthma. Majority of doctors, 60.1% (104/173) in tertiary and 57.3% (63/110) in non-tertiary, $P = 0.64$ were aware of the role of chronic inflammation in asthma pathology [Table 2]. In relation to the years of practice, there was a lower percentage among those who had practiced for more than 20 years when compared with those who had practiced for <20 years (39.2% [101/257] vs. 44.4% [11/26]), $P = 0.01$.

Diagnosis of asthma

Majority of doctors irrespective of location, years of practice and cadre were of the opinion that the best methods for

diagnosis of asthma were the combined use of history and physical examination and peak flow meter [Table 3]. In tertiary centers, 43.3% (75/173) of doctors and 33.6% (37/110) of those practicing in non-tertiary facilities considered chest X-ray important in diagnosis ($P = 0.10$) [Table 3].

Table 1: The characteristics of the study participants

Characteristics	Number	Frequency (%)
Gender		
Male	179	63.3
Female	104	36.7
Facility of practice		
Tertiary hospital	173	61.1
Nontertiary hospital	110	38.9
Cadre		
House officers	60	21.2
SHO/registrar	118	41.7
Senior registrars	28	9.9
Medical officers	52	18.4
Consultants	25	8.8
Years of practice		
5 and below	160	56.5
6-10	70	24.7
11-15	17	6.1
16-20	10	3.5
21-25	10	3.5
26-30	12	4.3
30 and above	4	1.4

SHO: Senior house officer

Table 2: Knowledge of respondent about the pathogenesis of asthma according to practice location and cadre of doctors

Characteristics	Pathogenesis of asthma (%)	
	Inflammation	Bronchospasm
Facility of practice		
Tertiary hospital	104 (60.1)	145 (83.8)
Nontertiary hospital	63 (57.3)	86 (78.2)
Cadre		
House officers	35 (58.3)	52 (86.7)
Registrar	76 (64.4)	99 (83.9)
Senior registrars	24 (85.7)	17 (60.3)
Medical officers	20 (38.5)	48 (92.3)
Consultants	12 (48.0)	15 (60.0)

Asthma classification

Ninety-four percent (266/283) of participants were knowledgeable regarding the classification of asthma into its acute and severe forms. However, in the further categorization of asthma severity, the years of practice was observed to relate to the level of correct knowledge. There was better knowledge among the low and high cadres doctors [Table 4]. The respondents who had practiced for more than 10 years were evenly divided in their knowledge of severe persistent asthma as a form of chronic asthma: 11-20 years in practice, 51.0% (14/27); >20 years in practice 50.0% (13/26), $P = 0.50$.

Management

The doctors interviewed were of the opinion that patient education (98.2%, 278/283) and environmental modification (94.2%, 267/283) were important components of treatment.

Bronchodilators

In acute exacerbation of asthma, 29.3% (83/283) of all responding doctors were ignorant of the use of inhaled bronchodilators in the treatment. Majority of doctors in the tertiary hospitals 58.3% (101/173) and non-tertiary health facilities 60.9% (67/110) were of the view that aminophylline was the appropriate first-line medication to use in exacerbation, $P = 0.67$. This was also the opinion of 80.7% (21/26) of the doctors who had practiced for more than 20 years in contrast to 59.2% of those who had practiced for 11-20 years (16/27) and 56.9% (131/230) who had practiced for 10 years and below ($P = 0.04$) [Table 5]. More than half of consultants 60% (15/25) and those who are older than 20 years in medical practice (53.8%, 14/26) were of the opinion that adrenaline was of value in the treatment of exacerbation of asthma. The knowledge about the use of aerosolized bronchodilators was high irrespective of the cadre or years of practice ($P < 0.01$).

Table 3: Frequency distribution of methods used in asthma diagnosis according cadre and facility of practice

Characteristics	Methods of asthma diagnosis				
	History	Physical examination	History and physical examination	Chest X-ray	Lung function test
Facility of practice					
Tertiary	72 (41.6)	29 (16.8)	172 (99.4)	75 (43.3)	160 (92.5)
Nontertiary	39 (35.5)	21 (19.1)	108 (98.2)	37 (33.6)	99 (90)
P value	0.3	0.6	0.3	0.1	0.4
Cadre					
House officers	26 (43.3)	6 (10)	58 (96.7)	24 (40)	53 (88.3)
SHO/registrars	46 (38.9)	26 (22)	117 (99.2)	50 (43.4)	110 (93.2)
Senior registrars	11 (39.3)	5 (17.9)	28 (100)	6 (21.4)	27 (96.4)
Medical officers	14 (26.9)	7 (13.5)	52 (100)	26 (50)	47 (90.4)
Consultants	14 (56)	6 (24)	25 (100)	6 (24)	22 (88)
P value	0.1	0.2	0.3	0.05	0.6

SHO: Senior house officer

Oxygen

Less than 1% (3/283) of doctors in both facilities (0.01% (1/173) in tertiary and 0.02% (2/110) in non-tertiary) had knowledge of the need for oxygen therapy in the treatment of acute asthma. Doctors of all categories and years of practice expressed this opinion. About 92% (159/173) of doctors and 86.4% (95/110) of those who practiced in tertiary and non-tertiary health facilities respectively were of the view that intravenous steroid should not be used in acute asthma exacerbation.

Controller medication

There was good knowledge of the use of combination therapy in the maintenance treatment of asthma, in the two of facilities (tertiary 87.3% [151/173] and non-tertiary 87.3% [96/110]). However, about 35% (62/178) of doctors in the low cadre had poor knowledge of the use of combination therapy (steroid and bronchodilators) for chronic asthma ($P = 0.001$).

Knowledge of guidelines and asthma control test methods

Knowledge of the Global Initiative on Asthma guideline (GINA) guidelines for asthma management was poor and varied, with 43.4% (75/173) of doctors in tertiary centers expressing awareness in comparison with 61.8% (68/110) of those practicing in non-tertiary centers, $P = 0.002$ ($P < 0.01$). There was a general lack of knowledge of the asthma control test among all cadres of doctors, (34.9%, 99/283, $P = 0.04$).

Table 4: Knowledge of chronic asthma classification by doctors of different years of practice

Years of practice	Number of doctors (%)		Total
	Aware	Not aware	
1-5	99 (61.9)	61 (38.1)	160
6-10	49 (70)	21 (30)	70
11-15	8 (47.1)	9 (52.9)	17
16-20	6 (60)	4 (40)	10
21-25	5 (50)	5 (50)	10
26-30	6 (50)	6 (50)	12
31 and above	2 (50)	2 (50)	4
Total	175 (61.8)	108 (38.2)	283

P=0.5

Discussion

This study has shown that the majority of doctors interviewed who practice in the tertiary and non-tertiary centers are knowledgeable about the epidemiology and clinical features of asthma. Our study showed that the lower cadre of doctors, especially those who had practiced for <5 years were of the opinion that asthma is not a common disease in our environment, and this was irrespective of the facility of practice. This is contrary to studies which have shown increasing incidence of the disease both locally and in other developing countries.[1] The implication is the possible unpreparedness to tackle the increasing burden of disease.

The relationship between asthma and SES remains a point of debate. Different works of literature have described different associations with SES. Kozyrsky *et al*.[8] found asthma to be more common with children of low socio-economic class, while Farfel *et al*.[9] noted that asthma among adolescents was more in higher socioeconomic groups. The opinion of our study participants was variable and differed dependent on the cadre and years of practice. The older doctor's view that asthma occurs more in the higher SES may not be unconnected to the notion generally held it is the rich who may be exposed to lifestyles that predispose to asthma.

Asthma diagnosis is made clinically from history and physical examination. Substantial number of doctors in this study had this knowledge similar to the findings of Erhabor *et al*.[10] and Haque *et al*.[11] in Southwest Nigeria and Pakistan, respectively. Noteworthy from our study is the sizeable number of doctors who were ignorant of chest tightness as an asthma symptom. Although conveniently this may be attributed to the fact

Table 5: Knowledge of doctors about types of medication used in the treatment of acute exacerbation according to different cadre and institution

Characteristics	Type of medication used (%)				
	B_2 agonist (PMDI)	O_2	Oral steroids	Oral B_2 agonist	Intravenous aminophylline
Facility of practice					
Tertiary hospital	127 (73.4)	1 (0.6)	114 (65.9)	82.0 (47.4)	101 (58.4)
Nontertiary hospital	73 (66.4)	2 (1.8)	67 (60.9)	64 (58.2)	67 (60.9)
P value	0.2	0.3	0.4	0.08	0.7
Cadre					
House officers	39 (65)	0 (0)	35 (58.3)	27 (45.0)	40 (66.7)
Registrar	91 (77.1)	1 (0.8)	81 (68.6)	60 (50.8)	65 (55.1)
Senior registrars	19 (67.9)	0 (0)	14 (15.0)	12 (48.0)	10 (35.7)
Medical officers	34 (65.4)	1 (1.9)	39 (75.0)	35 (67.3)	37 (71.2)
Consultants	17 (68.0)	1 (4.0)	12 (48.0)	12 (48.0)	16 (64.0)
P value	0.7	0.5	0.04	0.1	0.01

PMDI: Pressurized metered-dose inhaler

that the majority of the study population were doctors who manage children, an age group who may not easily recognize or complain of chest tightness. However, the doctors were not only pediatricians who see children and failure to recognize and seek the symptom may cause delay in the treatment that consequently increase morbidity. The use of chest X-ray in asthma diagnosis is very limited and usually un-informing.[12]A sizeable proportion of our respondents regarded chest X-ray of some diagnostic importance, which contrasts with the finding of Erhabor *et al*.[10] whose study showed that a far lesser proportion, considered chest X-ray important. The view of our respondents may be unhelpful as valuable time of treatment may be wasted in seeking this diagnostic tool (chest X-ray) in uncomplicated episodes, which are relatively common presentations of asthma.

Asthma is classified broadly in terms of risks (exacerbations) and severity. The severity is further classified into intermittent and persistent forms. A minority of the study participants was unable to classify asthma correctly into acute and chronic forms. This was in consonance with the findings of Zoorab *et al*.[13] in Louisiana USA. Knowledge of the levels of asthma severity was better among doctors in the high and low cadres. This is understandable as doctors in the high cadre are usually the teachers of those in the lower cadre and will naturally pass across their knowledge. The implication of this seemingly lack of knowledge on therapy is that patients may be poorly categorized and consequently offered inadequate treatment, which will further reduce the ability to achieve control with its consequence on the individual and the health systems.

Although a good number of respondents were knowledgeable in the use of inhalational medications in acute asthma attacks, of significant concern is the high number of doctors who would first consider intravenous aminophylline in the treatment of this type of asthma. Of major concern is the cadre and years of the doctors (in non-tertiary hospitals and more than 20 years of practice) who expressed this view. This mirrors a disparity that may be related to insufficient awareness of the current guidelines by these groups of doctors. In contrast the doctors in the middle cadre (such as senior registrars and in tertiary institutions), had better knowledge of the fact that intravenous aminophylline is not recommended as a first line drug for the management of acute asthma. This may be explained by the fact that the latter group is made up of doctors in training programs who are exposed to various literature on current management practices.

Inhaled glucocorticosteroids are the most effective controller medications currently available. Unfortunately, the doctors in the study group showed significant lack of knowledge on the use of inhalational steroids in the management of asthma severity in consonance with the work by Fawibe *et al*.[14] in Nigeria, which showed a significant dearth of knowledge and best practice among doctors from different regions of Nigeria.

Guidelines for asthma management is published based on evidence to assist health care practitioners to provide the best management for their patients;[15,16] therefore, a good knowledge of the available guidelines is necessary for optimal management. Less than half of the participants in this study acknowledged the existence of the GINA guidelines, which may explain the variances noted in the different knowledge exhibited by the respondents. The poor knowledge of the guidelines among the practitioners in the tertiary centers is a cause for worry for these are expected to train and educate the next generation of doctors.

Study Limitations

The study subjects were drawn principally from the towns with tertiary institutions. The use of doctors in these institutions may have influenced the outcome of the study and may not be a good representation of the knowledge of the general population of doctors in the region.

Conclusions

Majority of doctors interviewed have good knowledge of asthma epidemiology, and clinical features; however, a sizeable number lack knowledge regarding the treatment of asthma either as an acute or chronic illness. Doctors in the lower cadre had poor knowledge of the use of combination therapy in the management of chronic asthma, while the knowledge of GINA guideline and asthma control test was lacking among the doctors. There is therefore need to improve the ability of the doctors to transform the base knowledge into clinical practice through continuing professional developmental activities. This step has been shown to significantly improve the knowledge and practice of doctors in similar circumstances around the world.

Recommendation

A more robust study is recommended to determine the actual knowledge base of the doctors.

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