Original Article

Practice of asthma management among doctors in south-east Nigeria

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Abstract

The major role of airway inflammation in childhood asthma has been recognised for more than a decade, and anti-inflammatory drugs now form the mainstay of treatment. In order to optimise treatment and achieve a better outcome, different guidelines have been introduced for asthma management. Examining the practice of the medical practitioners who manage asthma will help establish the gaps and provide informed advice on the current national and international guidelines.

Our objective was to investigate the appropriate treatment of acute bronchial asthma by medical practitioners in south-east Nigeria. Two hundred and eighty-five doctors were interviewed using a structured questionnaire. Evaluation for differences in asthma management by doctors with different years of practice and heath facilities was carried out. Results were analysed with Epi info version 3.5

We concluded that management based on newer trends in childhood asthma management and adherence to management guidelines is less common among doctors that work in non-tertiary health facilities and among doctors that graduated more than 15 years ago or less than 5 years ago. This needs to be improved for optimal management of these patients. The need for regular continuing medical education for all doctors cannot be over emphasised.

Introduction

Asthma is a chronic inflammatory disorder of the respiratory airways that manifests as recurring episodes of wheezing, breathlessness, chest tightness, and cough.[1,2] There is worldwide evidence of an increasing prevalence and, therefore, cost of uncontrolled asthma.[1–3] Among children, higher prevalence rates have been found in industrialised Western countries than in developing countries in Asia and Africa.[4] In Africa, there are considerable variations in asthma prevalence in childhood, both between countries and between centres in the same country. In South Africa, asthma prevalence in Cape Town is reported to be 20.3%, while it is 18.0% in Polokwane.[5] In Brazzaville, Congo, prevalence is 19.9%; in Nairobi, Kenya, 18.0%; on the urban Ivory Coast, 19.3%; and Conakry, Guinea, 18.6%.[5] In Nigeria, Falade et al[6] documented a prevalence of 5.1% among secondary school children in Ibadan in 2004.

The goal of asthma treatment is to reduce underlying inflammation, and decrease the daily symptom burden by preventing recurring attacks.[1] This requires proper diagnosis, adequate management, and regular follow-up. Medications used to manage asthma in acute exacerbation differ from those used in a chronic stable state. The major role of airway inflammation in childhood asthma has been recognised for more than a decade, and anti-inflammatory drugs now form the mainstay of treatment. Efforts should, therefore, be made to improve the quality of care by ensuring that doctors who treat asthma patients adhere to guidelines for managing asthma, especially in the use of anti-inflammatory agents. Clinicians in general have not widely and consistently used asthma guidelines in their practices around the world. In Nigeria, the story is no different. A general survey of doctors revealed that many were unaware of asthma guidelines and treated patients according to knowledge acquired at medical school or their experience with previous cases. This study was carried out to ascertain the practice of asthma management by doctors in south-east Nigeria.

Methods

This was a descriptive cross-sectional multi-centre study over a period of 8 months. The study participants were drawn from a population of 1130 registered medical practitioners working in three cities with colleges of medicine (Enugu, Nnewi, and Abakaliki) in south-east Nigeria. Using multi-staged stratified random sampling, 285 doctors were selected. Subjects were then interviewed using a pre-tested questionnaire.

The statistical assumption was a power of 80%, confidence interval of 95%, with a significant difference of 5%. The proportion of doctors in tertiary versus non-tertiary hospitals was assumed to be 2:1. The total minimum sample size calculated,[7] after correcting for non-response rate was 275. The proportionate recalculation for a

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ratio[7] of doctors in the two facility types under study required a minimum sample size of 97 from the non-tertiary facilities.

Data collection and analysis

The pre-tested questionnaires contained questions on management of asthma that included epidemiology, diagnosis, use of management tools, and medication. Answers were evaluated for differences, if any, in the practices of doctors in tertiary and non-tertiary facilities, and in doctors with fewer or more than 10 years of experience since graduating from medical school. The questionnaire distribution in the study sites was done proportionately (4:2:1) based on the average number of registered medical doctors in the towns. Proportionate stratification was also used in the tertiary facilities according to the total number of doctors employed in the departments that attend to asthma patients (Departments of Paediatrics, Internal Medicine, and General Outpatients). Proportionate stratification was also employed within these departments to ensure a spread that included consultants, senior registrars, registrars, house officers, and medical officers. Consenting general practitioners who worked in non-tertiary facilities that met inclusion criteria were also interviewed. An explanation of the study to the participants and the signing of consent forms were ensured by the research assistants before commencement of the study. The consenting study participants were asked to fill in the questionnaires where possible, returning them the same day to the research assistants. This helped reduce any external influence of answers given. Where not possible a specific date for collection was agreed on and adhered to for the return of the questionnaire. Each questionnaire was cross-checked on completion to ensure proper completion and reduce to a barest minimum any missing data.

Data of completed questionnaires were entered into the data sheet and analysed using Epi info version 3.5. Chi-square test was used in the categorical variables to test for significant differences in asthma management in the different groups, while Student's t test was used for continuous data with normal distribution.

Results

There were 285 respondents. A hundred and ninety four (68%) doctors were from tertiary health facilities while 91 (32%) were from non-tertiary health facilities. The female:male ratio was 1:1.5. The number of years of practice ranged between 1 and 35 years with a mean of 7.4 years (SD 7.68). Of the doctors interviewed, 56% had practised for 5 years or less, 25.2% had practised for 6–10 years, 5.8% had practised for 11–15 years, and the remaining 13% had practised for more than 15 years. Doctors in general practice and internal medicine made up half the study population while the other half were paediatricians (see Table 1).

Epidemiology and diagnosis

Doctors in both tertiary and non-tertiary health facilities saw patients with asthma regularly in their practice. The highest number of cases (75%) were seen by paediatricians. The age group most affected were between 5 and 10 years of age (51.2% of doctors, 95% confidence interval (CI) 45.3– 57.2%). Of doctors interviewed, 86.3% attended to asthma patients when they presented in acute exacerbation. Diagnosis was made 78.9% of the time, by a combination of symptoms and signs presented by the patient (95% CI 73.7–83.5%). Only 34% of doctors would use symptoms, signs, and additional lung function measures to make a diagnosis of asthma, and this was found to be in the ratio of 4:1 between doctors working in the tertiary and non-tertiary health facilities (CI 30.2 –41.7%, $p < 0.05$). A peak flow meter was used by doctors for lung function measurement; none used a spirometer. Of doctors with access to peak flow meters, 69% worked
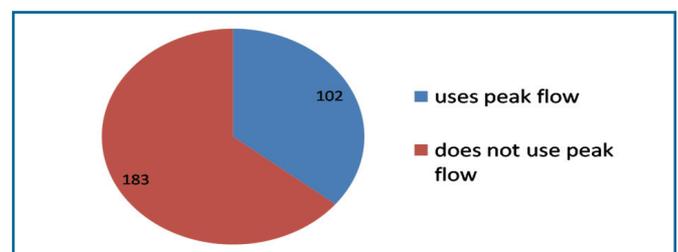

Figure 1 Doctors use of peak flow meter for asthma diagnosis

in tertiary health facilities (see Figure 1)

Use of management tools

The following tools were used in asthma management (see Figure 2):

- Peak flow meter (46% of doctors).

Table 1 Mean number of years of practice of doctors

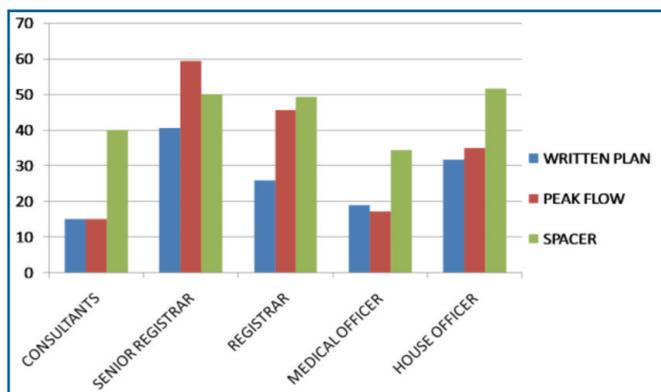| Status	Mean number of years of practice (tertiary health facilities)	Mean number of years of practice (non-tertiary health facilities)	p value
Consultant	21.2 (n=16)	24.9 (n=8)	0.5160
Senior registrar	16.5 (n=34)	31.0 (n=1)	0.2177
Registrar	6.0 (n=69)	5.4 (n=10)	0.3582
Medical officer	8.1 (n=11)	9.3 (n=57)	0.6559
House officer	1.4 (n=62)	1.1 (n=14)	0.5191

Figure 2 Use of asthma management tools

- Spacer or assisting device (in appropriate age group) for delivering aerosolised medication (36% of doctors).

The self-reported use of a written action plan and peak flow were least in consultants (16.7% CI 4.7–37.4% and 8.3% CI 1–27%), while the use of spacer devices recorded the lowest among medical officers (29% CI 18.7–41.2) (see Table 2).

Use of medication

The percentage of doctors using medication in the management of asthma patients were as follows:

- salbutamol (97.2%);
- prednisolone (81%);
- aminophylline (73.3%);
- hydrocortisone (67.7%);
- adrenaline (34.0%);
- ipratropium bromide (28.1%);
- cromolyn (16.8%).

During acute exacerbation, the three most used medications were nebulised salbutamol (55.1%), intravenous aminophylline (46%), and intravenous hydrocortisone (31.6%). The least used was intravenous salbutamol (1.4%). Use of nebulised salbutamol was higher in the tertiary health facilities (59.9%) than in non-tertiary (31.7%). The use of anti-inflammatory drugs such as steroids, either in oral or parenteral forms was not popular practice in up to 60% of doctors, irrespective of where they practised (OR 3.83; 2.02–7.32) (p>0.05)(see Table 3).

The majority of doctors (76.5%) use both reliever medication (such as beta agonists and theophylline derivatives) for acute asthma and controller medications (such as leukotriene receptor antagonist and oral steroid) for asthma in a stable state. However, for maintenance of asthma control in a stable state, prescription of inhaled

Table 3 Use of steroids for asthma management

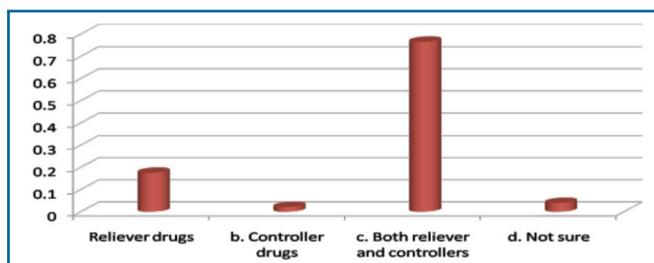| Steroid	Percentage of doctors
Oral prednisolone	7.8%
Oral prednisolone or i.v. hydrocortisone	9.0%
i.v. hydrocortisone	20.7%
Neither oral prednisolone nor i.v. hydrocortisone	62.5%

Figure 3 Use of reliever/controller medication for asthma management

long-acting corticosteroid was poor, as less than 1% of doctors in tertiary health facilities prescribed it (see Figure 3).

Supportive treatment/follow up

More than 70% of doctors used adjuncts such as intranasal oxygen and intravenous fluids in the management of their asthma patients. The use of antibiotics also played a prominent role, as up to 25% of doctors prescribed them during management, particularly doctors practising in the non-tertiary health facilities (80%). Only 41.4% of doctors saw their patient again – usually during repeat attacks (CI 35.3–47.8%)(p<0.05).

Discussion

Substantial gaps in practice were seen between doctors who worked in the two types of facilities studied and those who graduated before and after 10 years ago.

Asthma diagnosis is mainly clinical and this was well practised in this study; however, the use of lung function tests for diagnosis in patients aged 5 years and above was suboptimal. Many medical conditions can mimic asthma, thus the need for proper diagnosis. Asthma management tools for assessment and follow-up were also grossly underutilised in this study, especially in giving the patient a written action plan. This was noted

Table 2 Use of asthma management tools

	Doctors in tertiary health facility (n=194)	Doctors in non-tertiary health facility (n=91)
Use of peak flow meter	42.3%	15.2%
Use of spacer/assisting device	53.6%	29.7%
Use of written action plan	30.9%	19.8%

more in much older practising physicians. In a study done in Turkey,[8] older and more experienced physicians were less likely to use objective parameters such as lung function tests for asthma diagnosis and beta 2 agonists for the management of asthma attacks. Similar to other studies, there is still a lack of use of objective parameters in both asthma diagnosis and the severity assessment of an asthma attack during management. In research by Finkelstein and colleagues[9] it was stated that 12% and 3% of paediatricians in the US used spirometry and skin or radioallergosorbent testing always or most of the time for initial work-up, respectively.[9] In our own study, the greater use of the peak flow meter by doctors in tertiary hospitals may be attributed to lack of both the required equipment and the technical know-how. This highlights the need to equip health facilities, especially non-tertiary health facilities, with inexpensive tools such as peak flow meters and spirometers, for proper asthma diagnosis.

Asthma is not curable but its inflammatory patho-physiology is controllable. Nebulised salbutamol was used by a substantial number of doctors (54.7%), but the use of steroids is still sub-optimal. Beta-agonists, anticholinergic agents, and glucocorticoids are currently the most commonly used drug groups and this was the case in this study. Nebulised salbutamol was used less in non-tertiary health facilities. This may point to the unavailability of the equipment in non-tertiary health facilities. In the past, aminophylline was used extensively for acute asthma, despite side-effects. However, its use as a first-line drug has declined with the availability of effective inhaled bronchodilators and glucocorticoids.[10-12] Its use in south-east Nigeria, especially among older doctors and among doctors that work in non-tertiary health facilities, has not waned over the years, despite these newer recommendations.

A study in Turkey showed that for long-term asthma management, inhaled corticosteroids and leukotriene receptor antagonist, were the most frequently preferred drugs. The advent of this new class of agents offered the clinician a new opportunity to treat patients with drugs other than steroids, given the concerns about their safety and adverse effects,[9] and positive compliance issues with once-daily oral medications.[13] In south-east Nigeria, use of steroids in management of asthma – and especially the use of inhaled controller medications – is still poor, particularly among doctors in the non-tertiary health facilities. In Turkey, the social security system covers the cost of all anti-inflammatory drugs and bronchodilators in the treatment of asthma, and all are readily available throughout the country. This is not the case with the National Health Insurance scheme in Nigeria, and may affect adherence to treatment protocols for practices in Nigeria. It also possible that the doctors, especially in the non-tertiary health facilities, are not sufficiently aware of the role of inflammation in asthma and its treatment with systemic or inhaled corticosteroids, thus informing their choice of medication. This again reiterates the need for regular continuing medical education (CME).

Unfortunately, in Nigeria, attendance at workshops and CME meetings is voluntary, and there is no credit system to facilitate participation in these meetings.

This study demonstrated significant differences in methods of asthma diagnosis, and the application of asthma management tools, between doctors that work in tertiary compared with non-tertiary health facilities, especially among medical officers and consultants. There were also significant differences in the use of nebulised form of medication and intravenous aminophylline. There was no significant difference in the lack of use of steroids for asthma management.

Conclusion

Gaps remain in trends in childhood asthma management among doctors in different health facilities. It is less noticeable among doctors that graduated more than 15 years ago or less than 5 years ago. Re-education and a review of asthma knowledge is necessary to keep clinical practitioners at the forefront of standard practice.

Health facilities at all levels should be equipped with the tools for optimal asthma management. Regular CME in asthma management is needed and should be a pre-requisite for all doctors receiving their annual practice licence registration at every level of practice, whether in tertiary or non–tertiary health facilities.

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