

Epidemiology, triggers, and severity of childhood asthma in Ilesa, Nigeria: Implications for management and control

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ABSTRACT

Background: Knowledge about childhood asthma in a locality will assist clinicians to adequately manage the condition. This study set out to report the epidemiology, triggers of exacerbation, comorbid conditions, and severity of childhood asthma at a tertiary health facility in Nigeria and the implication of these, in management and symptoms control. **Methods:** Over a 15-month study period, children (aged <15 years) with physician-diagnosed asthma were consecutively recruited at the pediatric chest clinic of the hospital. Sociodemographic history, triggers, and comorbidities in the children were recorded. The severity and level of symptoms control were determined using Global Initiative for Asthma criteria. The children were examined and had lung function test. Appropriate descriptive and inferential statistics were used to analyze the data obtained. **Results:** A total of 110 children were recruited for the study with an overall male preponderance 1.6:1, however, more adolescent females than males were observed. The ages of the children ranged from 10 months to 14 years with mean (standard deviation) of 6.4 (3.9) years. The median (interquartile range) age at diagnosis was 2.5 (1.5–6.0) years. The comorbidities were allergic rhinoconjunctivitis (45.5%), atopic dermatitis (10.9%), and overweight/obesity (7.3%). The recognizable triggers of exacerbations were respiratory tract infections (RTIs) seen more in preschool than school age children ($\chi^2 = 6.225$; $P = 0.031$), exercise, dust, and fumes. Mild intermittent asthma (82.7%) was the most common forms, 13 (25.0%) of the children who had Spirometry had obstructive ventilatory pattern and 17.3% had suboptimal asthma control. **Conclusion:** The majority of children with asthma at the Wesley Guild Hospital, Ilesa were school age children, however, 10% were <2 years and most asthmatics (72.7%) were diagnosed before age five. RTI is a major trigger of exacerbation and more than one-half had other allergic conditions which should be looked for and managed to ensure successful asthma management.

Key words: Childhood asthma, comorbidities, control, triggers

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INTRODUCTION

Asthma is a chronic inflammatory airway disease in which cells and cellular elements play a significant role in its pathogenesis.¹ Childhood asthma often manifest with recurrent episodic cough, breathlessness, chest tightness recognized by older children, exercise intolerance, and wheezing. These symptoms may resolve spontaneously

or with the use of bronchodilators.¹ Presentation with varied severity of acute exacerbations may be the first manifestation of bronchial asthma in children.¹

Asthma is a leading cause of respiratory disorder globally with over 300 million people suffering from the disease and prevalence ranging from 1% to 18%.¹⁻³ It is

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estimated by the World Health Organization (WHO) to be responsible for the loss of 15 million disability-adjusted life years annually.^{3,4} In Nigeria, asthma is second to pulmonary tuberculosis as a cause of childhood chronic respiratory disorder.⁴ The prevalence of childhood asthma is not known with certainty in Nigeria. What is certain however is that the prevalence is increasing in Nigeria and worldwide.^{1,2} Falade *et al.*⁵ in 2004 for instance, reported a prevalence of 7.6% among school-age children using International Study of Asthma and Allergies in Childhood questionnaire in Ibadan, a place where earlier studies reported much lower prevalence of 2.4–3.6%.^{6,7}

Childhood asthma has significant psychosocial and economic implications at the individual, family, communal, and national levels.³ Asthma is a common cause of visit to the emergency room, school absenteeism in children and absent from work of parents and caregivers thereby reducing their productivity.⁸ It impairs the quality of life of children and their caregivers.^{8,9} It is also a cause of personal and governmental spending on health¹⁰ as it is estimated that over \$2.0 billion was spent directly or indirectly on childhood asthma in the USA alone in the year 2000.^{10,11}

Important goals of childhood asthma management are to ensure well-controlled symptoms of asthma, to avoid the limitation of physical activities by the disease, to ensure good partnerships between health-care providers and patients/caregivers and to give comprehensive asthma education.¹ These goals are only achievable if health-care providers have good knowledge of the disease particularly the sociodemographic factors, triggers, comorbid conditions, and clinical profile as well as local perception of childhood asthma, medication use, and drugs availability in the particular locality.^{1,3}

Many factors have been highlighted to affect, modify and determine the severity, comorbid conditions, level of control and ability of children and caregivers to cope with the condition.¹²⁻¹⁴ These factors vary from one location to another as local experience and perceptions may affect them.^{1,3} This study is an attempt to highlight the epidemiology, possible triggers of exacerbation, associated comorbid conditions, severity, and lung function profile of asthma in children attending the chest clinic of a tertiary health facility in southwest Nigeria and the implication of these in the management and control of the disease.

METHODS

Study design

This was a hospital-based (descriptive) cross-sectional study.

Study location

This study was carried out at the pediatric chest clinic of the Wesley Guild Hospital (WGH), Ilesa, Nigeria over a 15-month period (January 2015 to March 2016). The clinic is run once a week by a team of clinicians including a consultant pediatrician, resident doctors, and other staff. Ten to 15 children with infectious and noninfectious respiratory conditions are attended to in the clinic every week.

The WGH (located in Ilesa latitude 7°35' N and longitude 4°51' E)¹⁵ offers general and specialized pediatric care to the communities of Osun state and few other neighboring states in South West Nigeria and it is a tertiary annexe of the Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife.

Study population

All children aged <15 years with physician-diagnosed asthma and/or history of recurrent episodes of a cough, wheezing, chest tightness, and shortness of breath which resolves spontaneously or with the use of bronchodilators were consecutively recruited. Informed consent and assent were obtained from the caregivers and older children, respectively. Other inclusion criteria for the study were having attended the chest clinic for a minimum of 3 months so that records of severity, previous hospitalization, and level of symptoms control could be assessed.

Sociodemographic information obtained from the patients and or the caregiver included age, sex, and age at diagnosis of asthma in the child and the period the child had lived with the disease. Parental and family history of asthma was also obtained. Family and personal history of other allergic conditions like allergic rhinoconjunctivitis and atopic dermatitis were also obtained, and the children were examined for other associated conditions such as nasal polyps and gastroesophageal reflux disease (GERD).

The severity of asthma at first before management was commenced at the clinic was categorized into mild intermittent, mild, moderate, and severe persistent based on Global Initiative for Asthma (GINA) guidelines.¹⁶ The caregivers were asked about the frequency of daytime symptoms, nighttime sleep disturbance from symptoms of asthma, days with the limitation of activities due to asthma during the past month.¹⁶ Parental socioeconomic class was determined using the method described by Oyedele.¹⁷ This is based on rank assessment of the highest educational attainment of both parents and their occupations. Professionals with postsecondary education were ranked as upper class, whereas unskilled laborers or petty traders with no formal education or primary education were ranked as low social class.¹⁷

The level of asthma control for the study participants was assessed according to GINA guidelines.¹ Children with at

least one nocturnal asthma symptoms, two or more daytime symptoms within a month, use of rescue medication for at least twice per week and any form of limitation of normal activities as a result of asthma symptoms were classified as having suboptimal (partly and poorly) control. Children without the highlighted symptoms were classified as having well-controlled asthma.¹

The examination done included the anthropometrics of the children including the weight, height from where their nutritional status was derived using the WHO/NHCS reference value.¹⁸ Overweight was defined as weight for age >2 standard deviation (SD) from the median, while obesity was defined as weight for age >3 SD from the median.¹⁸ The children were also examined for signs of allergic conditions such as vernal conjunctivitis, Dennis Morgan folds, allergic shiners, atopic dermatitis, and popular urticarial. Others included allergic rhinitis and nasal polyposis. Thorough systemic examination was done for all study participants and information documented in a data pro forma.

Lung function testing

This was assessed using a dry rolling seal spirometer (MIR Spirolab III spirometer Medical International Research Srl, Italy) to measure forced expiratory volume in 1 s (FEV₁); forced vital capacity (FVC); and peak expiratory flow rate at the lung function test laboratory of the hospital.

Lung function assessment was done for children aged 6–14 years who could carry out a forced expiratory manoeuvre. After explaining and demonstrating the procedure to the study participant, nose clips were worn by the study participant to ensure mouth breathing and the test was done in sitting position. The children were required to inhaled to maximum capacity (total lung capacity) and exhale as fast and as long as possible (to residual volume) through the mouthpiece into the spirometer to get the required parameters.¹⁹ The predicted values used for this study were based on the data of Knudson *et al.*²⁰

Children withheld using β -agonists and sodium cromoglycate for 12 h. The procedure was done following ATS/ERS recommendations.¹⁹ Each participant had minimum of three and maximum of eight recordings as recommended by the ATS/ERS.¹⁹ The best reading out of those that met the acceptability and or usability criteria was used for the interpretations of the lung function parameters.¹⁹

The ratio of FEV₁ to FVC was calculated and expressed in percentage. A minimum of three flow-volume loop results within 150 ml (100 ml if FVC <1.0 L) of highest and next highest FVC were recorded and the flow-volume loop with the highest FEV₁ was analyzed. FEV₁/FVC <80% or lower limit of normal was defined as obstructive ventilatory pattern.¹⁹

This study was approved by the Ethics and Research Committee of the OAUTHC, Ile-Ife with protocol number ERC/2015/02/12.

Data analysis

This was done using Statistical Programme for Social Sciences (SPSS) software version 17.0 (SPSS Inc., Chicago, IL, USA 2008) and Win PEPI®.²¹ Categorical variables like sex, severity of asthma and asthma control were summarized using proportions and percentages, while continuous variables such as age of the children and caregivers and duration since asthma was diagnosed were summarized using means and SD for normally distributed variables and median and interquartile ranges (IQR) for nonnormally distributed ones.

Differences between categorical variables (age range vs. triggers of acute exacerbations) were analyzed using Pearson's Chi-square test and Fisher's exact test as appropriate. The level of significance at 95% confidence interval was taken at $P < 0.05$.

RESULTS

Over a 15-month period (January 2015 to March 2016) 110 children with asthma were recruited into the study.

Sex and age distribution of the children

There were 67 (60.9%) males giving male to female ratio of 1.6:1; however, among adolescents with asthma, there was female preponderance with a male to female ratio of 0.6:1. The ages of the children with asthma at recruitment ranged from 10 months to 14 years with a mean (SD) age of 6.4 (3.9) years. The majority of the children (52.7%) were school age 6–14 years, only 11 (10.0%) were <2 years, the rest (37.3%) were preschool children [Tables 1 and 2].

Age at diagnosis

The median (IQR) age at diagnosis of asthma was 2.5 (1.5–6.0) years. This ranged from 9 month to 14 years. The majority (72.7%) of the children were diagnosed asthmatics before age five.

Place of residence

Majority (89.1%) of the children reside in Ilesa where the chest clinic is located, only 12 (10.9%) reside outside Ilesa.

Parental socioeconomic class

Most of the children (44.5%) were from high socioeconomic class, 47 (42.7%) were from middle class while the rest (12.7%) were from low socioeconomic class.

Maternal educational qualifications

All the mothers had at least primary education with more than one-half (52.0%) of the mothers having postsecondary school education.

Table 1: Sociodemographic characteristics and general information of the children with asthma seen at the pediatric chest clinic of the Wesley Guild Hospital, Ilesa

Variables	Frequency (110)	Percentages
Gender		
Male	67	60.9
Female	43	39.1
Age (years)		
<2	11	10.0
Preschool (2-5)	41	37.3
School age (6-12)	58	52.7
Adolescents (13-14)	11	10.0
Parental social class		
Upper	49	44.5
Middle	47	42.8
Lower	14	12.7
Maternal highest educational qualifications		
Primary	22	20.0
Secondary	30	27.3
Postsecondary	58	52.7
Number of children in household		
≤3	81	73.6
>3	29	26.4
Overcrowding	23	20.9
Presence of household pets	42	38.2
EBF	62	56.4
Gestational age		
Term	108	98.2
Preterm	2	1.8

EBF – Exclusive breastfeeding

Table 2: The sex distribution of the children with asthma as related to age groups

Age groups	Male, n=67 (%)	Females, n=43 (%)	Total	χ^2	P
Under 2	8 (11.9)	3 (7.0)	11	0.272	0.602*
Preschool	30 (44.8)	12 (27.9)	42	3.158	0.076
School age	25 (37.3)	21 (48.8)	46	1.430	0.232
Adolescents	4 (6.0)	7 (16.3)	11	2.053	0.152*

The figures in parentheses are percentages of total in each column. *Fisher's exact applied

Exclusive breastfeeding

The mean (SD) duration of breastfeeding was 4.9 (2.1) months. This ranged from 1 to 16 months of exclusive breastfeeding. 62 (56.4%) of the children were exclusively breastfed for the first 4–6 months of life.

Information about housing and household

Twenty-three (20.9%) of the children lived in overcrowded homes, and 29 (26.4%) had more than three other children living in the same household as the child with asthma. Over one-third of the children had household pets which are mainly dogs and cats [Table 1].

Household cigarette smoke exposure

Twenty-one (19.1%) of the children had at least one family member who habitually smokes cigarette.

Household cooking fuel

The majority (85.4%) of the household use unclean fuel for household cooking which is basically kerosene stove in 82.7%. Only 16 (14.5%) of the study participants used clean fuel, i.e., electric and gas for household cooking [Table 3].

Previous asthma-related hospitalization

About one-half of the children had previous asthma-related hospitalization which was only once in 35 (32.1%), and three or more times in 8 (7.2%).

Comorbid conditions and triggers of acute exacerbation

Eighty-two (74.5%) of the children with asthma had one comorbid condition or the other. These included other allergic conditions in 62 (56.4%) and obesity in 8 (7.3%). The possible triggers of acute exacerbation reported in the children included upper respiratory tract infections (RTIs), fumes and dust as well as exercise [Table 3]. In about 25.0% of the children, no recognizable trigger of exacerbation was reported. Twenty-eight children (26.4%) however reported more than one trigger of acute exacerbation.

Triggers of asthma as related to age range

More proportion of school age asthmatics reported that exercise, dust, and cold weather triggered their asthma exacerbation than preschool children though the differences were not statistically significant [Table 4]. However, significantly more proportion of preschool asthmatics were reported to have RTIs as the possible triggers of acute exacerbation as 20 (66.6%) of preschool asthmatics compared to 10 (33.3%) of school-age asthmatics reported RTIs as a trigger of acute asthmatic exacerbation ($\chi^2 = 6.225$; $df = 1$; $P = 0.031$) [Table 4].

Severity of asthma

Figure 1 highlights the severity of chronic asthma before management among the study participants. The majority (82.7%) of the children were on intermittent short-acting beta agonist to achieve good asthma control thus classified as mild (intermittent) asthma. Eighteen (17.3%) of the children had to be on steroid (inhalational corticosteroid or oral) as controller medication with or without leukotriene antagonists thus classified as persistent (mild and moderate) asthma. None of the study participants had severe persistent asthma.

Ventilatory functions of the study participants

Of the 57 children (aged ≥6 years) who had their lung function test done using spirometer, 5 (8.8%) could not perform an acceptable and or useable test despite repeating the procedure for a maximum of eight times. Of the 52 children with acceptable and usable lung function tracing, 13 (25.0%) had abnormal lung function testing basically obstructive ventilatory pattern while 39 (75.5%) had normal lung function parameters. Significantly, more

Table 3: Family history, comorbid conditions, and triggers in the children

Variables	Frequency (110)	Percentage
Previous asthma-related hospitalization	54	49.1
Once	35	31.8
Twice	11	10.0
>2	8	7.3
Family history of asthma	58	52.7
Parents	34	30.9
Grandparents	8	7.3
Siblings	10	9.1
Uncle/aunt	6	5.4
Household tobacco smoke exposure	21	19.1
Comorbid conditions		
Allergic rhinoconjunctivitis	50	45.5
Atopic dermatitis	12	10.9
Nasal polyps	6	5.4
GERD	6	5.4
Obesity	8	7.3
Triggers of asthma exacerbation*		
URTI	30	27.3
Dust	20	18.2
Fumes	7	6.4
Cold weather	12	10.9
Food (pasta)	1	0.9
Exercise	14	12.7
Unknown triggers	27	24.5
Types of cooking fuel		
Clean fuel	16	14.5
Kerosene	91	82.7
Firewood	3	2.7
Control status		
Well controlled	91	82.7
Partly controlled	11	10.0
Uncontrolled	8	7.3

*Some children had more than one trigger. URTI – Upper respiratory tract infection; GERD – Gastroesophageal reflux disease

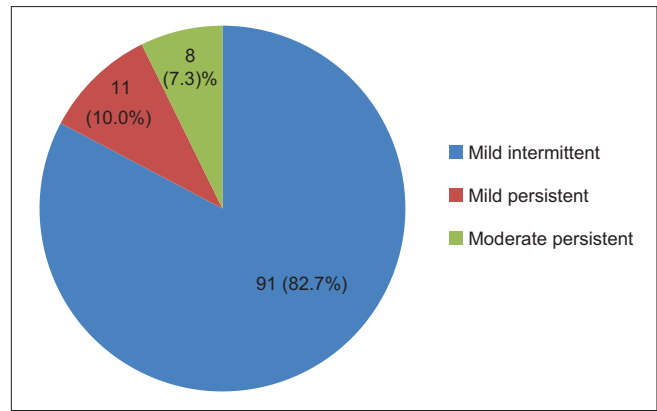
Table 4: The triggers of acute exacerbation as related to age range among the study participants

Triggers of acute exacerbation	Age <5 years n=52 (%)	Age >5 years n=58 (%)	Total	χ^2	P
URTI	20 (38.5)	10 (17.2)	30	6.225	0.013
Exercise	5 (9.6)	9 (15.5)	14	0.860	0.354
Dust	6 (11.5)	14 (24.1)	20	2.926	0.087
Cold weather	4 (7.7)	8 (13.8)	12	0.516	0.473
Fumes	3 (5.8)	4 (6.9)	7	0	1.000*
Unknown	14 (26.9)	13 (22.4)	27	0.301	0.583

The figures in parentheses are percentages of total in each column. *Fisher's exact applied. URTI – Upper respiratory tract infection

proportions of adolescents (6 of 11) than the younger age groups (11 of 41) had obstructive ventilatory pattern which were reversible with the use of inhaled short acting beta 2 agonist (54.5% vs. 17.1%; $\chi^2 = 6.495$; $P = 0.011$).

The mean (SD) FEV₁ of the children with acceptable and usable lung function test was 1.6 (0.7) L which ranged from 0.44 to 4.05 L. The FVC ranged from 0.5 to 5.1 L with

**Figure 1: The distribution of asthma severity among the study participants**

a mean (SD) of 1.8 (0.9) L. The FEV₁/FVC ratio ranged from 51% to 99.8% with a mean (SD) of 88.8% (10.6).

Asthma control

Ninety-one (83.7%) of the children had well-controlled asthma, and 19 (17.3%) had suboptimal asthma control which was partly controlled in 11 (10.0%) and uncontrolled in 8 (7.3%).

DISCUSSION

This study has presented data on the epidemiology, severity, clinical, and lung function parameters of childhood asthmatics at the WGH, Ilesa, Nigeria and the association of the triggers with the age distribution in the children.

Overall, male preponderance was noticed among the children with a male-to-female ratio of 1.6:1. This male preponderance in childhood asthma is similarly reported in earlier studies within^{5-7,22-26} and outside Nigeria.^{12,13} However, among adolescents in the study, there was a female preponderance. This reversal in gender difference at puberty was also reported by Postma.²⁷ The reason for increased prevalence of asthma in males than females among preadolescent children may be related to the fact that asthma in boys tends to be diagnosed earlier and wheezing in them occur for much longer periods making them more likely to be recognized and diagnosed than in girl.²⁸ As adolescent period sets in; hormonal changes and the influence of menstruation may increase the frequency and severity of wheezing in females making the prevalence and severity of asthma to be worse in female adolescents compared to their male counterpart.^{28,29}

The age distribution of the children with asthma revealed that 47.3% were under-fives and majority of the children with asthma were school age children. This age distribution is similar to reports by Garba *et al.*²² in North West Nigeria. Worthy of note from this study is that 10.0% of the children with asthma were <2 years with youngest study participant

being 10-month old. This is similarly reported by Garba *et al.*²² in Kano where the youngest study participant was 8 months. This underscores the need to have a high index of suspicion and promptly diagnosed asthma in infants and young children if present to ensure good asthma control and improve quality of life in both the child and caregivers.^{8,9}

Furthermore, the average age of diagnosis of asthma was 2.5 years which is similar to the 3.0 years reported by Sofowora and Clarke.⁷ Also Garba *et al.*²² reported that 40.0% of the cohort of children with asthma in Kano, Northwest Nigeria were diagnosed before the 3rd year of life. These further imply that preschool children should be carefully evaluated for asthma and diagnosed early to improve prognosis and control.

Majority of the children with asthma from this study were from high socioeconomic class unlike children with infectious respiratory diseases like pneumonia from the same center where the bulk of the children were from low and middle socioeconomic class.³⁰ This is similarly reported by Aderole⁶ from Ibadan Nigeria. This observation corroborate the hygiene hypothesis in which children from high socioeconomic class with relatively good standard of living and less likelihood of exposure to viral infections will have up-regulation of T-helper cells 2 with increased pro-allergic and pro-asthmatic cytokine release.³¹ This may also be related to more health-seeking behaviors of children from high social class who may also be able to afford the cost of care for the illness.^{12,32} In addition, health literacy is higher among children whose parents are from high social class making them to have more clinic attendance;^{1,32} since this study was hospital based, it may not be unexpected to see more children with parents from high socioeconomic class than those from low socioeconomic class. Some workers, however, reported a significant association between childhood asthma and middle²² as well as low socioeconomic class.³³ More studies on the impact of socioeconomic class on the prevalence and severity of childhood asthma will be worthwhile.

In terms of severity of asthma, majority of the children in this study had mild intermittent asthma which is similar to reported pattern in Benin South-South Nigeria.²³ Garba *et al.*²² however reported more cases of persistent asthma than intermittent forms in Kano. The severity of childhood asthma is a reflection of rapidity of recognition and diagnosis of the disease, the degree of exposure of the child to pollutants and triggers of acute exacerbation, the perception of the caregivers to the disease and their willingness to assess care as well as their access to quality health-care delivery system. This implies that childhood asthma should be diagnosed early, classified appropriately and managed stepwise according to standardized guidelines.¹

Worthy of note is that RTIs are the most common recognizable and reported triggers of acute exacerbation of asthma in this study, particularly among under-fives. Exercise, dust, fumes, and cold weather were more common triggers in older children. These findings were similarly reported by Sofowora and Clarke⁷ in Ibadan South West Nigeria. Under-five children are predispose to recurrent RTIs for a number of reasons including inadequate immune response to infection, suboptimal secretory IgA production and their exposure to indoor and outdoor air pollutions.³⁴ This is corroborated by the fact that only 14.5% of the children in this study live in households where clean fuels are used for cooking and heating. These implies that children with asthma should be protected from infections by ensuring routine childhood immunization, adequate breastfeeding and prompt treatment of upper and lower RTI to prevent frequent asthma exacerbation thus promoting good control of asthma symptoms.³⁵ Likewise, the importance of protecting them from getting in contact with fumes, dusts, and air pollutants cannot be overemphasized.³⁶

One of the pillars of adequate management of childhood asthma included early recognition and management of comorbid conditions to ensure optimal asthma control.¹⁻³ In the present study, comorbid conditions found in the children with asthma included allergic rhinoconjunctivitis, atopic dermatitis, obesity, GERD, and nasal polyps. These findings were similar to findings by Garba *et al.*,²² Oviawe and Osarogiagbon²³ as well as Boulay and Bollet.³⁷ Children with allergic rhinitis are at increased risk of asthma exacerbation probably due to the fact that increased oral breathing often seen in children with allergic rhinitis due to impaired filtering and humidifying functions of the nose leads to increased exposure of the lower airway to allergens and other triggers of asthma exacerbation.³⁷

The relationship between asthma and GERD has been described as being cause and effect in nature.³⁸ Children with asthma have been reported to have a much greater risk of GERD-related symptoms than the general population.³⁸ Likewise, patients with GERD have a significantly higher risk of concurrent asthma compared with patients without GERD.³⁸ GERD could cause aspiration induced inflammation and airway hyper-responsiveness. Alternatively, asthma-related bronchoconstriction and asthma medications can induce GERD.³⁸ The early recognition and prompt management of GERD and other comorbidities in childhood asthma is very germane in ensuring good control of asthma symptoms in these children.

Obstructive ventilatory pattern was observed in one-quarter of the children who were able to perform acceptable and useable Spirometry. Expectedly, the abnormalities in ventilation were seen more among the adolescents than in

the younger age groups. This is in keeping with the fact that it takes time for airway remodeling and abnormalities to set in in children with uncontrolled asthma for ventilatory abnormalities to be detected on lung Spirometry.¹ Appropriate use of anti-inflammatory medications particularly inhaled corticosteroids is very cardinal not only to reduce inflammation, ensure well-controlled asthma symptoms but also to avoid airway remodeling and abnormalities of ventilation. This also underscores the need for appropriate and objective assessment of children with asthma using spirometers which is also important for their follow-up.¹ This is so as merely reporting of the frequency of symptoms and limitation of activities alone may not adequately assess the severity and control of asthma symptoms due to poor symptoms perceptions and underreporting by the children and their caregivers.

In terms of asthma control, the majority of the children had well-controlled asthma which may be a reflection of the fact that most of them (had intermittent asthma) depended only on occasional use of short-acting beta agonist for optimal asthma control. However, approximately, one of 5–6 children had suboptimal asthma symptoms control based on GINA criteria.¹ This implies that the need for assessment of symptoms control and risks factors for suboptimal control like poor inhalation techniques, nonadherence to action plan and psychological and socioeconomic problems at every clinic visit cannot be overemphasized.¹ In addition, appropriate and judicious step up of treatment options should be done to ensure optimal asthma symptoms control.¹

The authors appreciate the limitations that the presence of psychosocial and emotional problems in the children and their caregivers were not assessed in this study. These are vital comorbid conditions which have been reported to affect the perception, management, and control of the disease.¹ Furthermore, recall bias pertaining to the frequency of asthma symptoms recorded over a period may also be present as objective assessment of control through the use of lung function assessment was not done for preschool study participants. Nonetheless, this study had been able to report the sociodemographic characteristics, triggers, comorbid conditions and severity of childhood asthma in a tertiary health facility in Nigeria highlighting their implications to management and control of the disease.

CONCLUSION

Childhood asthma in Ilesa, Nigeria was found to be more common in preadolescent males than females with reversal of sex preponderance during the adolescent years. One-tenth of the children with asthma were <2 years and more proportions of the children were from high socioeconomic class. Mild intermittent form of asthma predominates with RTI being the most reported triggers of

acute exacerbation among the preschool asthmatics, while exercise, exposure to dust and fumes were more important triggers among the school age asthmatics. Allergic conditions were observed in about one-half of the children. Majority of the children had well-controlled asthma. The need for prompt diagnosis, appropriate assessment, and monitoring as well as management of children with asthma is important to improve the quality of life of these children and their caregivers.

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Conflicts of interest

There are no conflicts of interest.

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