



Allergy history as a predictor of early onset adenoids/adenotonsillar hypertrophy among Nigerian children

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ABSTRACT

Background: Previous reports have established the association of allergy with adenoidal and tonsillar hypertrophy, and adenotonsillar hypertrophy is a well known co-morbid factor in patients with allergic rhinitis. Very little is known about the association of history of allergy with timing of first presentation in adenotonsillitis patients.

Setting: Tertiary care urban referral hospital.

Study design: Descriptive analysis of prospectively collected data.

Methods: All cases which had adenotonsillectomy carried out between September 2005 and September 2012 at National Hospital Abuja that met the selection criteria were recruited and analyzed on the basis of family history of allergy in first degree relatives, clinical history of allergic rhinitis, asthma and atopic dermatitis.

Result: Total of 434 cases were recruited. Mean age was 5 years (range 9 months–15 years, std. dev. 3.535). 56% of participants were aged 3 years and below. 22, 15, and 16% of participants aged 3 years and below had family history of allergy, allergic rhinitis and atopic dermatitis respectively compared to 6, 4 and 4% for participants aged above 3 years. The mean age at onset of symptoms is 7.59, 10.32, and 13.62 months for participants with family history of allergy, clinical allergic rhinitis and atopic dermatitis respectively and 23.890 months for participants with no history of atopy or allergy. Family history of allergy significantly predicts onset of symptoms before age 6 months (OR 7.59, 95% CI 4.74–12.12, $P < 0.0001$).

Conclusions: Family history of allergy and presence of clinical allergic or atopic dermatitis are related to early onset of symptoms in Nigerian children with adenoids/adenotonsillar hypertrophy.

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1. Introduction

Adenoids and/or tonsillar inflammation with concomitant obstructive hypertrophy is one of the oldest and most common pediatric problems [1]. Upper airway allergy, defined as IgE-mediated hypersensitivity inflammation of mucosal lining of the upper airway is documented to have co-morbid relationship with adenoids and adenotonsillar hypertrophy. It is postulated that cellular immune deficiency in allergic children could explain the enlargement of pharyngeal tonsils [2].

Whilst some earlier report indicated over 20% incidence of atopic diseases in children who had adenoidectomy [3], others observed similar incidence of allergic genesis of otitis media with effusion (OME) and adenoids in children even without history of allergic rhinitis [4].

Allergic rhinitis (AR) is seen in 10–30% of population, with greatest frequency found in children and adolescent and is as such over-represented in literature reporting the roles of allergy in adenotonsillar hypertrophy. Sih and Mion [5] reported adenoidal hypertrophy as one of the co morbidities of AR. Said et al., 2012 observed that 92.6% of cases of AR seen in Tanzania have adenoidal hypertrophy, tonsillitis, hypertrophy of inferior turbinates, nasal polyps, otitis media and sinusitis as the most common co morbidities [6]. Modrzynski and Zawisza observed that the probability of adenoid hypertrophy was statistically more significant in children with AR and/or bronchial asthma and/or atopic dermatitis compared to controls [7]. However, AR typically presents after the second year of life, and for pediatric AR, two or more seasons of pollen exposure are generally needed for sensitization [5].

The import of this, when taken with the earlier observation of Becker et al. [4] is that asthma and atopic dermatitis, aside from AR, might be independent co morbid factors in adenoids/adenotonsillar hypertrophy.

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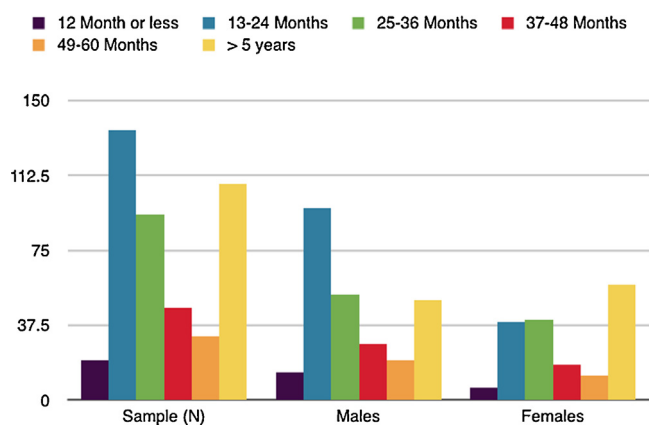


Fig. 1. Age and sex distribution of 434 Nigerian children surgically managed for adenoids/adenotonsillar hypertrophy.

Whilst most publication on the influence of allergy on adenoids/adenotonsillar hypertrophy focused on aggravation of hypertrophy and increasing incidence and association, very little is known regarding time of onset of symptoms of adenoids/adenotonsillar hypertrophy in patients with allergy.

2. Methodology

This is a descriptive analysis of prospectively-collected data obtained from cases of adenoids/adenotonsillitis surgically managed at National Hospital Abuja, a tertiary care, referral center, between September 2005 and September 2012. The selection criteria included age 1 month–15 years, clinical diagnosis of adenoids/adenotonsillar hypertrophy with indication for surgery, and willingness to participate. All cases that were conservatively managed were excluded from the study. Children with sickle cell disease, and those with craniofacial syndromes were excluded. The following were obtained from the patients on admission to the hospital for surgery and entered into the study protocol: age, sex, family history of food, drug, or other allergies – in first degree relatives, clinical features of allergic rhinitis – excessive sneezing, itchy eyes/nose/throat, and rhinorrhoea, and medical history of atopic dermatitis and/or asthma. The minimum criteria for diagnosis of allergic rhinitis in our study was excessive sneezing, plus either one or more of itchy eyes, itchy nose, itchy throat, and clear watery rhinorrhoea. Data from the theater register was compared to the study protocol and any case not featuring in both was excluded from the study. Diagnosis of adenoids was based on clinical presentation of snoring and mouth-breathing and/or struggle to breathe during sleeping combine with postnasal space radiography showing adenoidal/nasopharyngeal ratio >0.5. Adenotonsillar hypertrophy diagnosis was based on diagnosis of adenoids plus tonsillar hypertrophy of +2 or +3 based on Brodsky scale. For the purpose of this study, early-onset adenoids/

Table 2

Distribution of number of allergy history according to age groups.

	1 Allergy history ^a	2 or More allergy history ^b	No atopy or allergy history
1 year and below	12	8	0
1+ to 2 years	75	27	18
2+ to 3 years	42	9	42
3+ to 4 years	13	5	28
4+ to 5 years	9	0	20
>5 years	40	5	64

^a Positive history of one the following symptoms: allergic rhinitis, atopic dermatitis, asthma, or family history of allergy.

^b Positive history of two or more of the these symptoms: AR, atopic dermatitis, asthma or family history of allergy.

adenotonsillitis refers to cases in which onset of symptoms was first noticed at or before the age of 6 months. Results were statistically analyzed using SPSS for Windows, Version 15.

3. Results

A total of 434 cases of adenoids/adenotonsillar hypertrophy fulfilled the study criteria. There were 263 males and 171 females (male:female ratio 1.5:1). Fig. 1 is the age and sex distribution of the participants in this study. The mean age of participants in this study was 5 years (range 9 months–15 years, std. dev. 3.535).

124 (28.5%) of study participants had positive family history of allergy (PFH), 81 (18.7%) had clinical features of allergic rhinitis (AR), while 89 (20.5%) reported atopic dermatitis (AD), and 26 (5.9%) had history of Asthma. 135 of participants had no known personal or family history of atopy (31.1%).

The mean age at onset of symptoms (MAO) for participants with PFH was 7.59 months (std. dev. 9.899), for those with clinical AR was 10.32 months (std. dev. 7.071), for those with AD is 8.73 months (std. dev. 13.623), for those with asthma was 28.15 months (std. dev. 19.19), while for those with no history of atopy or allergy, the mean age was 29.54 months (std. dev. 23.890). Table 1 shows the distribution of allergy history according to age group.

The mean age at presentation (MAP) for participants with single history of allergy was 11.74 months (std. dev. 15.76), and for those with 2 or more history of allergy was 7.5 months (std. dev. 10.21) Table 2 shows the distribution of mean age at presentation among different age groups.

120/217 (55.3%) of the single allergy history group had onset of symptoms at age 6 months and below, while 37/56 (66.1%) of the 2 or more allergy group had mean age of onset of symptoms at age 6 months and below. Only 2/26 (7.69%) of participants with history of Asthma had onset of symptoms at age 6 months and below. Table 4 shows comparison of the allergy history among adenoidectomy and adenotonsillectomy cohorts.

The odds of onset of symptoms before age 6 months is higher for participants with family history of allergy (odds ratio (OR) 7.6, 95% confidence interval (CI) 4.745–12.16, $P < 0.001$) and those with

Table 1

Distribution of allergy history according to age at presentation among 434 Nigerian children surgically managed for adenoids/adenotonsillar hypertrophy.

Age group	Total no (N)	Allergic rhinitis history N (%)	Family history of allergy N (%)	Asthma history N (%)	Atopic dermatitis history N (%)	No atopy/allergy history N (%)	No. adenoidectomy N (%)	No. adenotonsillectomy N (%)
1 year and below	20	5 (25)	14 (70)	0 (0)	5 (25)	6 (30)	14 (70)	6 (30)
1+ to 2 years	135	32 (23.7)	63 (46.7)	0 (0)	45 (33.3)	8 (5.9)	61 (45.1)	74 (54.8)
2+ to 3 years	93	25 (26.8)	19 (20.4)	2 (2.15)	18 (19.3)	29 (31.1)	12 (12.9)	81 (87.1)
3+ to 4 years	46	4 (8.7)	11 (23.9)	3 (6.5)	8 (17.4)	20 (43.4)	14 (43.8)	32 (69.5)
4+ to 5 years	32	2 (6.2)	5 (15.6)	3 (9.4)	0 (0)	20 (62.5)	5 (15.6)	27 (84.4)
>5 year	108	13 (12)	12 (11.1)	18 (16.7)	13 (12)	52 (48.1)	7 (6.5)	101 (93.5)

Note the percentage sum in each row is greater than 100% (total number, N) because of the observation of participants with multiple history of allergy.

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