



## ADENOID HYPERTROPHY AND ITS RELATION WITH ALLERGIC RHINITIS IN PEDIATRIC POPULATION IN NORTHERN INDIA

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### ABSTRACT

**Background:** As a consequence of antigenic stimulation associated with chronic inflammation, the adenoids may enlarge so that they may almost fill the nasopharynx. Moreover, adenoid hypertrophy and allergic rhinitis can co-exist in the same patient and treating allergy may relieve patient's symptoms and thus avoid unnecessary surgery. **Aim:** To study the relation of adenoid hypertrophy and with allergic rhinitis. **Methodology:** This was a prospective observational study conducted on pediatric patients presenting with adenoid hypertrophy in OPD in department of ENT, PGIMER, Chandigarh. All patients underwent a detailed history, endoscopy, skin prick test and x-ray nasopharynx lateral view. **Results:** A total of 40 patients were included in this study. The results of this study showed that there was no significant association between allergy and nasal obstruction neither measured by endoscopy.

### KEYWORDS :

#### INTRODUCTION:

The adenoid tissue (pharyngeal tonsil) is a part of peripheral lymphatic system, which is mainly formed by B-cell lymphocytes (50-65%) and T cells lymphocytes (40%). Adenoids are present in the nasopharynx. The adenoid tissue play very important role in adaptive immunity because of location in nasopharynx. Due to chronic stimulation, the adenoid hypertrophy may occur which leads to almost filling of the space between the choana and nasopharynx, reduction in the nasal airflow and eustachian tube blockage. AH is present in 1<sup>3rd</sup> of the paediatric patients and it is the most common cause of surgery in paediatric patients [1,2]. The sequelae of adenoid hypertrophy are obstruction in nose, snoring, sleep apnoea, otitis media with effusion, sinusitis and craniofacial anomalies [3]. Obstruction in nose is the most frequent symptom in the paediatric age and it is associated with many childhood diseases, but a proper evaluation is required before any management.

In paediatric patients, adenoid hypertrophy is described as the most common cause of nasal obstruction [4,5]. Adenoid hypertrophy can present with multiple nasal symptoms with obstruction, mouth breathing, snoring, sleep apnoea and speech impairment (rhinolalia and changes in phoneme production) being common in paediatric patients [4,5]. Nasal obstruction in children is usually due to enlarged adenoidal tissue, but other causes should be considered: allergic rhinitis may also produce the "adenoidal face" usually attributed to adenoid hypertrophy [6].

Because of the localization in the nasopharynx, the measurement of both the adenoid tissue and the obstruction in airflow is very difficult. Several methods are required to grade the adenoids in nasopharynx acoustic rhinomanometry, rhinomanometry, endoscopy and radiography [7]. But the most common used preoperative method is the X ray nasopharynx and endoscopy [8]. Several previous studies evaluate these methods for AH [7-13]. But the direct visualization of the nasopharynx should be considered. Due to this reason direct endoscopy considered as most reliable method [7].

The purpose of this article was to study the relation of adenoid hypertrophy and with allergic rhinitis.

#### METHODOLOGY:

This prospective observational study was conducted in the department of ENT, PGIMER, Chandigarh. All children of age 4 to 14 years who were diagnosed with adenoid hypertrophy were included in the study after informed assent from either

parent. Any patient with history of any nasal surgery or currently on anti-inflammatory anti allergic drugs was excluded from the study.

All patients underwent a detailed history, endoscopy, skin prick test and x-ray nasopharynx lateral view.

#### Nasal Endoscopy

Endoscopy was done with a paediatric rigid endoscope diameter of 2.7 mm with a 0° angle (Karl Storz) with a 300-W cold light source (Storz Xenon) and a light cable of 1.8-m length. The children were laid supine with their heads bent by 45°. Some cotton wool soaked with anaesthetic solution (4% lignocaine) was placed into the nose for 5 minutes.

The patients were evaluated by endoscopy for adenoid hypertrophy and adenoids were graded according to Parikh's classification.

#### Skin-Prick Test

Sensitization will be assessed for the most common classes of allergens using SPT. The allergen battery consisted of the following: Dust mites, moulds, cats, dogs, grasses mix, weeds pollen, animal dander, food. The concentration of allergen extracts was 100 immune reactivity/mL (Merck Germany). A histamine solution in distilled water (10 mg/mL) will be used as positive control and the saline is used as negative control. Each patient would be skin tested on the volar surface of the forearm using 1-mm prick lancets (Merck). The skin reaction was noted after 20 minutes by evaluating the skin response in comparison with the wheal given by the positive and the negative control. A wheal diameter of at least 3 mm is considered as a positive reaction. Positive results should be at least 1 mm greater than the negative control.

#### RESULTS:

A total of 40 patients were enrolled for the study. A thorough history and clinical examination, SPT, nasal endoscopy and x ray nasopharynx were done in all the children enrolled in study.

The mean age was 10.15 years with range from 4 years to 14 years with 28 (70%) male and 12 (30%) female children.

**Table 1: Allergens positive on skin prick test**

Allergens Positive (on SPT)	Frequency	Percentage
Dust mite	16	40
Pollen weeds	6	15
Pollen grasses	5	12.5

Mould	3	7.5
Food	2	5

**Table 2: Distribution of patients on basis of parikh’s classification**

Parikh's classification		Frequency	Percentage
Adenoid Hypertrophy absent	Grade 1	12	30
	Grade 2	9	22.5
Adenoid Hypertrophy present	Grade 3	17	42.5
	Grade 4	2	5
Total		40	100

**Table 3: Relation of allergens and adenoid hypertrophy based on parikh’s classification**

	Adenoid Hypertrophy Positive	Adenoid Hypertrophy Negative	Total	P Value
Dust mite	7	9	16	0.005
Pollen weeds	2	4	6	0.055
Pollen grasses	2	3	5	0.149
Mould	0	3	3	0.022
Food	0	2	2	0.085

There was statistically significant relation between adenoid hypertrophy observed on basis of Parikh's classification and dust mite (p value 0.005) and mould (p value 0.022) suggesting that allergy due to dust mite and mould does not cause adenoid hypertrophy. Rest other allergens which were pollens of weeds and grasses and food had no statistically significant relation with adenoid hypertrophy.

**DISCUSSION:**

Allergic diseases in children are mostly manifested as asthma, allergic rhinitis (AR) and atopic dermatitis (AD). AH and allergic diseases are the most common cause of morbidity in childhood[14].

A study by Franco Ameli et al in 2013 in 205 children 92 (44.9%) with obstruction in nose and 28 (13.7%) had choanae invasion. There is no relation between (r 0.41; p 0.001) obstruction in nose and AH. There is a decreased chance of AH with severity of nasal obstruction. This study shows that AH may be associated with absence of allergy, whereas IT hypertrophy may be associated with AR[15].

Yonis MAM et al in their study observed a negative correlation between allergy and adenoid volume as measured by nasal endoscopy[16].

Gerber et al. and Raphael et al. reported that allergy was more frequent in children with AH, but the differences observed were fairly insignificant[17,18].

Similarly, in our study it was observed that allergy and adenoid hypertrophy had no statistically significant relation with each other.

**CONCLUSION**

This study showed that large adenoid may be associated with absence of allergy. These finding may be helpful in clinical management of a child with nasal obstruction, so a detailed evaluation of the nose and nasopharynx is mandatory in each child with this complaint and it should be performed by nasal endoscopy. Consequently, the treatment should be geared toward the specific findings in that individual.

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