



**ORIGINAL RESEARCH PAPER**

**ENT**

**PROFILE OF ALLERGIC RHINITIS IN PEDIATRIC POPULATION OF NORTHERN INDIA**

**KEY WORDS:**

**Rishabh Chadda** MO specialist, Civil Hospital, Jogindernagar, H.P.

**Tapender Singh\*** MO Specialist, Civil Hospital, Paonta Sahib, Sirmour, HP. \*Corresponding Author

**ABSTRACT**

**Background:** Allergic rhinitis (AR) is most common chronic diseases, which affect the 10-40% of the entire population. It can have negative impact on quality of life of children which can affect the scholastic performance of the child. **Methodology:** It was a prospective observational study conducted in the OPD Department of ENT in PGIMER, Chandigarh. All pediatric patients aged between 4 to 15 years, who presented with nasal obstruction without any history of previous surgery were included. **Results:** A total of 40 patients were enrolled for the study. The mean age of children enrolled was 10.15 years ranging from 4 to 14 years. The most common symptom observed was nasal obstruction present in all the 40 (100%) children followed by mouth breathing which was present in 34 (85%) children.

**INTRODUCTION:**

Allergic rhinitis (AR) is most common chronic diseases, which affect the 10-40% of the entire population. Prevalence of this disease has increased as suggested by epidemiological studies[1-3] . AR is most common after 2 years age as more than two seasons required for allergen exposur[4].

Allergic rhinitis is defined as symptoms of sneezing, nasal pruritus, airflow obstruction, and mostly clear nasal discharge caused by IgE-mediated reactions against inhaled allergens and involving mucosal inflammation driven by type 2 helper T (Th2) cells[5]. Allergens of importance include seasonal pollens and molds, as well as perennial indoor allergens, such as dust mites, pets, pests, and some molds. The pattern of dominant allergens depends on the geographic region and the degree of urbanization, but the overall prevalence of sensitization to allergens does not vary across census tracts in the United States[6]. Sensitization to inhaled allergens begins during the first year of life; sensitization to indoor allergens precedes sensitization to pollens. Because viral respiratory infections occur frequently in young children and produce similar symptoms, it is very difficult to diagnose allergic rhinitis in the first 2 or 3 years of life. The prevalence of allergic rhinitis peaks in the second to fourth decades of life and then gradually diminishes[7,8]. Skin prick test (SPT) is a standardized, most rapid, sensitive and cost-effective test to detect IgE-mediated allergic diseases. Generally accepted indications for SPT include allergic rhinitis, asthma, atopic dermatitis, suspected food allergies, latex allergy, and conditions in which specific IgE is suggested to play a role in the pathogenesis. It provides information about the presence of specific IgE to protein and peptide antigens (allergens). Identification of common aeroallergens in an area is necessary, in order to educate the patient on what allergens to avoid and also help find the best formulation of allergen immunotherapy for effective AR treatment.

Allergic rhinitis can have negative impact on quality of life of children which can affect the scholastic performance of the child. So, this study was done to find the clinical profile and skin sensitivity to common allergens by skin prick test in children with allergic rhinitis less than fifteen years.

**MATERIALS AND METHODS:**

It was a prospective observational study conducted in the OPD Department of ENT in Post Graduate Institute of Medical Education and Research, Chandigarh. All pediatric patients aged between 4 to 15 years, who presented with nasal obstruction without any history of previous surgery were included. Patients with acute rhinosinusitis or those presently on anti-inflammatory anti allergic drugs were excluded from the study.

All the patients underwent a detailed otolaryngological

examination, skin prick test and x ray nasopharynx lateral view. Nasal obstruction perception was evaluated by faces rating scale.

**Skin-Prick Test:**

Sensitization will be assessed for the most common classes of allergens using SPT. It is performed as stated by the European Academy of Allergy and Clinical Immunology. 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 1mm 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 of children enrolled was 10.15 years ranging from 4 to 14 years. There were a total of 28 (70%) male and 12(30%) female children with male:female ratio of 2.33:1. History of smoking in family was present in 15 (38%) children and there was no statistically significant relation between adenoid hypertrophy and history of smoking in family (p value 0.075). Allergy to dust mite was observed in 16 (40%) children which had statistically significant relation with adenoid hypertrophy (p value <0.001) followed by pollens of weeds which was present in 6 (15%) children. 32 (80%) had symptoms persisting throughout the year with persistent symptoms in 27 (67.5%) children. In 39 (97.5%) children, symptoms were triggered in both indoor and outdoor settings while in only 1 (2.5%) child the symptoms were triggered in indoor(Table 1).

**Table 1: Demographic and symptom profile in enrolled patients**

		Frequency	Percentage
Sex	Male	28	70
	Female	12	30
Allergy	Dust mite	16	40
	Pollen weeds	6	15
	Pollen grasses	5	12.5

	Mould	3	7.5
	Food	2	5
Seasonal variation of symptoms	Perennial	32	80
	Perennial with seasonal exacerbation	8	20
Symptoms duration	Intermittent	13	32.5
	Persistent	27	67.5
Symptom time	All day	1	2.5
	Anytime	26	65
	Morning	13	32.5
Symptoms triggered	Indoor	1	2.5
	Indoor and outdoor both	39	97.5
Family history of smoking		15	37.5

The most common symptom observed was nasal obstruction present in all the 40 (100%) children followed by mouth breathing which was present in 34 (85%) children (Table 2).

**Table 2: Symptoms with which patients presented**

Symptom	Frequency	Percentage
Nasal Obstruction	40	100
Mouth Breathing	34	85
Recurrent URTI	12	30
Nasal Discharge	5	12.5
Excessive Sneezing	1	2.5
Eye Watering	1	2.5

38 (95%) children were graded as having moderate symptoms while on basis of X-ray 13 were classified as grade 1 and 19 (47.56%) as grade 3. As per the faces rating scale, which is a subjective rating scale based on severity of symptoms, 3(7.5%) children had a score of 0 while 14(3%) had score of 2 (Table 3).

**Table 3: Grading of adenoid hypertrophy**

Symptom severity		Frequency	Percentage
Symptom severity	Moderate	38	95
	Severe	2	5
X ray grading	Grade 1	13	32.5
	Grade 2	6	15
	Grade 3	19	47.5
	Grade 4	2	5
Faces rating scale	0	3	7.5
	2	14	35
	4	21	52.5
	6	2	5

The prevalence of allergic diseases is increasing worldwide and the burden of these diseases is increasing in prevalence and severity in India as well. The common allergic diseases include asthma, rhinitis, anaphylaxis, drug and food allergy, eczema, urticaria and angioedema. Among these allergic diseases, Allergic Rhinitis is an extremely common disease worldwide, affecting 10 to 25% of the population.

Sex specific differences in prevalence of allergic rhinitis and asthma over the life span were recognized, showing a higher prevalence of allergic rhinitis and asthma as single entities in boys than in girls during childhood followed by an equal distribution in adolescence [9,10], similar findings were observed in our study. The higher incidence of allergic rhinitis in boys may be partly due to more exposure to outdoor aeroallergens.

In present study also the most common allergen tested positive was dust mite, similarly Shyna KP et al in their study reported that the most common allergen was house dust mite [11].

**CONCLUSION:**

Allergic Rhinitis with a number of allergic co morbidities has

a significant impact on the quality of life and scholastic performance of children. So, studying the clinical features and identifying allergens responsible for precipitating allergic rhinitis in the region is essential to implement appropriate treatment and prevention strategies. Skin prick test which is a standardized, most rapid, sensitive and cost effective test to detect IgE- mediated allergic diseases is helpful in identifying the common allergens. Dust mite is the commonest allergen tested positive in present study.

**REFERENCES**

- Marseglia GL, Caimmi D, Pagella f, Matti E, Labo E, Licari A et al. Adenoids during childhood: the facts. *Int J Immunopathol Pharmacol.* 2011;24:1-5.
- McColley SA, Carroll JL, Curtis S, Loughlin GM, Sampson HA. High prevalence of allergic sensitization in children with habitual snoring and obstructive sleep apnea. *1997;111:170-3.*
- Lee JT, Lam ZC, Fa Lee WT, Kuo LC, Jayant V, Singh G et al. Familial risk of allergic rhinitis and atopic dermatitis among Chinese families in Singapore. *Ann Acad Med Singapore.* 2004;33:71-4.
- Sih T, Mion O. Allergic rhinitis in the child and associated comorbidities. *Pediatr Allergy Immunol.* 2010;e107:13.
- Bousquet J, Khaltaev N, Cruz AA, et al. Allergic Rhinitis and its Impact on Asthma (ARIA) 2008 update (in collaboration with the World Health Organization, GA(2)LEN and AllerGen) *Allergy.* 2008;63(Suppl 86):8-160.
- Salo PM, Arbes SJ, Jr, Jaramillo R, et al. Prevalence of allergic sensitization in the United States: results from the National Health and Nutrition Examination Survey (NHANES) 2005-2006. *J Allergy Clin Immunol.* 2014;134:350-9.
- Salo PM, Calatroni A, Gergen PJ, et al. Allergy-related outcomes in relation to serum IgE: results from the National Health and Nutrition Examination Survey 2005-2006. *J Allergy Clin Immunol.* 2011;127:1226-35.
- Yonekura S, Okamoto Y, Horiguchi S, et al. Effects of aging on the natural history of seasonal allergic rhinitis in middle-aged subjects in South Chiba, Japan. *Int Arch Allergy Immunol.* 2012;157:73-80.
- Kurukulaaratchy RJ, Karmaus W, Arshad SH. Sex and atopy influences on the natural history of rhinitis. *Allergy Clin Immu.* 2012;12:7-12.
- Pinar M, Keller T, Reich A, Fröhlich M, Cabieses B, Hohmann C et al. Sex-related allergic rhinitis prevalence switch from childhood to adulthood: a systematic review and meta-analysis. *Int Arch Allergy Immunol.* 2017;172:224-35
- Shyna KP, Kumari VM, Krishnan DK, Azeez VKA. Clinical profile and skin prick test analysis in children with allergic rhinitis of North Kerala, India. *Int J Contemp Pediatr* 2018;5:372-6.