

Clinical Signs in Allergic Rhinitis Patients at Dr. Hasan Sadikin General Hospital Bandung 2017-2021

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Abstract

Background: The clinical diagnosis of allergic rhinitis requires comprehensive data from the history and physical examination. Despite being a substantial component of the diagnosis of allergic rhinitis, there is a paucity of studies about clinical signs of allergic rhinitis in Indonesia. This study aimed to describe the clinical signs in allergic rhinitis patients at Dr. Hasan Sadikin General Hospital Bandung.

Methods: This cross-sectional study was conducted at Dr. Hasan Sadikin General Hospital Bandung in 2021, including secondary data of patients with allergic rhinitis from medical records registered from 2017 to 2021. Data on the characteristics, clinical signs, and allergic rhinitis comorbidities were collected and presented in tables.

Results: The most common clinical sign was turbinate hypertrophy (74%), followed by pale nasal mucosa (59%) and clear nasal discharge (59%). The most prevalent comorbidities were chronic rhinosinusitis, adenoid hypertrophy, and asthma.

Conclusion: The clinical signs observed from allergic rhinitis patients may vary, with the most common findings, including nasal turbinate hypertrophy, pale nasal mucosa, and clear nasal discharge. The findings may help clinicians to diagnose allergic rhinitis needed for therapy management.

Keywords: Allergic Rhinitis, clinical signs, diagnosis

Introduction

Allergic rhinitis is a disorder of nasal mucosa due to exposure to allergen particles that cause inflammation mediated by Immunoglobulin E (IgE).¹ The symptoms include nasal congestion, runny nose, sneezing, an itchy nose, and loss of smell when the nasal mucosa is exposed to allergens. Allergic rhinitis affects about 10% to 30% of the world's population. Based on a previous study, the prevalence of allergic rhinitis in Indonesia is 38.2%.²

The diagnosis of allergic rhinitis is made based on history taking, physical examination, and supporting examination.¹ A complete history is required to look for potential triggers, nasal symptoms, and a family history of atopy. Clinical signs observed from physical examination act as objective evidence to rule out the differential diagnosis and may

indicate the presence of comorbidities. Physical examination is performed by anterior rhinoscopy, which shows hypertrophy and pale inferior turbinate mucosa with clear secretions. Nasal endoscopy can be performed to assess the nasal cavity in more detail and support the diagnosis of allergic rhinitis.^{3,4} The comorbidities include asthma, conjunctivitis, chronic rhinosinusitis with or without nasal polyps, otitis media with effusion, and adenoid hypertrophy. Those comorbidities cause sleep disturbance which acts as factors that worsen the quality of life if not given the appropriate treatment.⁵ Definitive diagnosis is made by detecting allergen-specific IgE or the skin prick test.⁶

The clinical diagnosis of allergic rhinitis, which is established as a prerequisite for appropriate treatment, requires comprehensive data from the history and physical examination.

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Despite being a substantial component of the diagnosis of allergic rhinitis, there is a paucity of studies about clinical signs of allergic rhinitis in Indonesia. This study aimed to describe the clinical signs in allergic rhinitis patients at Dr. Hasan Sadikin General Hospital Bandung.

Methods

This study was a descriptive observational study with a cross-sectional design conducted from January to December 2021 at the Department of Otorhinolaryngology Head and Neck Surgery Dr. Hasan Sadikin General Hospital Bandung. The study subjects were patients diagnosed with allergic rhinitis from January 2017 to October 2021. The sample was selected using the total sampling method. Secondary data were taken from medical records and after obtaining ethical clearance from the Health Research Ethics Committee of Dr. Hasan Sadikin General Hospital Bandung No. 816/UN6.KEP/EC/2021.

The inclusion criteria in this study were patients diagnosed with allergic rhinitis confirmed by a skin prick test, while the exclusion criteria were incomplete or missing medical records. The study variables were age, gender, family history of atopic disease, classification, cardinal symptoms, physical findings, and comorbidities. The collected data were analyzed using Microsoft Excel 2020 software to calculate the frequency of findings and presented in tables.

Results

Out of 463 patients with allergic rhinitis, 260 were included. The distribution of gender, age groups, and family history of the atopic disease was provided in Table 1. The classification of allergic rhinitis was described in Table 2 based on the ARIA-WHO guidelines. The most prevalent classification was moderate-severe persistent allergic rhinitis (45%), and the least

Table 1 Characteristics of Allergic Rhinitis Patients at Dr. Hasan Sadikin General Hospital (n=260)

Characteristics	n	%
Gender		
Male	127	49
Female	133	51
Age group (year)		
< 10	22	8
10–19	62	24
20–29	63	24
30–39	30	12
40–49	38	15
≥ 50	45	17
Family history of atopic disease		
Yes	107	41
No	145	56
Unknown	8	3

prevalent was moderate-severe intermittent (4%).

The most common cardinal symptom was nasal congestion (87%), followed by a runny nose (81%), sneezing (72%), and an itchy nose (49%). The physical findings included the nasal cavity, left and right ears, and oropharynx examinations.

On anterior rhinoscopy examination, the most common clinical manifestations were inferior turbinate hypertrophy (74%) with pale mucosa (59%) and clear discharge (59%). On nasal endoscopic examination, inferior turbinate hypertrophy (82%) and clear nasal secretions (72%) were found in almost all patients.

The most common comorbidities were chronic rhinosinusitis without polyps (53%), adenoid hypertrophy or sleep disturbances (23%), and asthma (11%). Only 19% of patients had no comorbidities.

Table 2 Classification of Allergic Rhinitis in Patients at Dr. Hasan Sadikin General Hospital according to ARIA-WHO Guidelines

Classification	Frequency (n)	Percentage (%)
Mild intermittent	84	32
Mild persistent	47	18
Moderate-severe intermittent	11	4
Moderate-severe persistent	118	45
Total	260	100

Table 3 Cardinal Symptoms, Physical Findings, and Distribution of Comorbidities in Patients with Allergic Rhinitis at Dr. Hasan Sadikin General Hospital

Findings	Frequency (n)	Percentage (%)
Cardinal symptoms		
Nasal obstruction	220	87
Runny nose	205	81
Sneezing	182	72
Itchy nose	125	49
Anterior rhinoscopy		
Nasal mucosa		
Calm	100	38
Pale/livid	153	59
Hyperemic	7	3
Nasal discharge		
Clear	154	59
Purulent	9	3
Inferior turbinate hypertrophy	192	74
Ear examination		
Hyperemic mucosa	4	2
Secret		
Clear	6	2
Purulent	2	1
Tympanic membrane perforation	21	8
Oropharynx examination		
Hyperemic mucosa	3	1
Tonsil hypertrophy		
Grade 2	23	9
Grade 3	6	2
Grade 4	3	1
Nasal endoscopy		
Inferior turbinate hypertrophy	214	82
Nasal discharge		
Clear	203	78
Purulent	16	6
Septum deviation	82	32
Adenoid hypertrophy	59	23
Postnasal drip	56	22
Middle turbinate hypertrophy	52	20
Middle meatus opening		
Sufficient	155	60
Narrow	93	36
Congested	12	5
Uncinate process edema	110	42
Polyps		
Grade 1	3	1
Grade 2	4	2
Grade 3	18	7
Comorbidities		
Asthma	28	11
Chronic rhinosinusitis without polyps	138	53
Chronic rhinosinusitis with polyps	25	10
Chronic Suppurative Otitis Media	9	3
Adenoid Hypertrophy	59	23

Discussion

In the present study, the number of the female with allergic rhinitis patients was higher than that of males. The higher prevalence of female allergic rhinitis patients might occur due to estrogen and progesterone, which increase mast cell and IgE activity, making females more susceptible to atopic diseases such as allergic rhinitis and asthma.⁷ The most prominent age groups were 10–19 and 20–29 year, who are still in school-age and productive age. Allergic rhinitis in both age groups impacts decreased productivity due to impaired concentration at school or work caused by the symptoms experienced, prompting patients to seek help from health facilities.¹⁶ Many studies have shown that a family history of atopy is a risk factor for allergic rhinitis. A study in Sweden concluded that children born to parents with allergy have an increased 2–9 folds risk of allergic rhinitis.⁸ Another study on Turkish adolescents with allergic rhinitis showed that 53% of the study population had at least 1 parent with atopy.⁹ Similarly, a study in Indonesia has shown that 54% of cases present with an atopic family history.² These data were consistent with the results of our study, where nearly half (41%) of the patients had a family history of atopic disease.

The classification of persistent moderate-severe allergy was the most common form in our study, similar to the previous studies conducted in clinical settings.^{5,10} The reduced quality of life in patients with moderate-severe persistent allergic rhinitis might have caused the patients to be more likely to seek medical therapy than patients with milder allergic rhinitis classifications.⁵

Cardinal symptoms of allergic rhinitis include nasal congestion, runny nose, sneezing, and itchy nose.¹ In a study involving 979 allergic rhinitis patients in France showed that nasal congestion was found in 82% of patients, followed by the runny nose (89%), sneezing (82%), and itchy nose (68%).¹⁰ These were consistent with our study. The discrepancy between some studies with others could be explained by the varied symptoms of allergic rhinitis and comorbidities the study subjects might have.

The anterior rhinoscopy examination showed inferior turbinate hypertrophy, clear secretions, and pale mucosa in most study samples. Inflammatory mediators released by mast cells cause interstitial edema of the nasal mucosa, resulting in turbinate hypertrophy.¹¹ A study in Tanzania on 193 allergic rhinitis

patients noted concha hypertrophy (69%), and another study in North Vietnam found turbinate hypertrophy (70%).^{12,13} The mechanisms of increased watery nasal secretions include histamine-induced mucosal gland hyperactivity and plasma leakage.¹¹

Clear and watery nasal discharge was observed in 59%; however, the number of patients who complained of a runny nose was quite high (81%). The difference might occur due to patients with intermittent allergic rhinitis or patients who had received previous treatment, which allowed the secretions to be not visible at the time of the examination. A pale mucosal color caused by chronic inflammation of the nasal mucosa is associated with the level of eosinophil infiltration, which is a hallmark of allergic rhinitis. A study in Japan showed that the proportion of pink or normal mucosal color was 57%, and pale was 43%.¹⁴ However, the study did not include the diagnosis of allergic rhinitis as an inclusion criterion that the subjects might not had before the examination.¹⁴ In contrast to the study, our study was conducted on patients diagnosed with allergic rhinitis, and the most common color of the mucosa was pale blue (59%). The subjectivity in determining the mucosa color might have affected the results of both studies.

This study included the results of ear and oropharynx examinations. A small proportion of patients in this study showed ear membrane perforation (8%) and ear discharge (3%) which could be associated with chronic suppurative otitis media. Previous studies have shown that allergic rhinitis is a risk factor for chronic suppurative otitis media. The mechanism involved is nasal mucosa inflammation of allergic rhinitis patients can cause eustachian tube dysfunction, making it easier for acute infections to recur and inflammatory response of the middle ear mucosa to the allergens occur as in nasal mucosa.^{15,16} Tonsil hypertrophy was found in 31 cases (12%), with grade 2 (9%) being the most common compared with grade 3 (2%) or 4 (1%). A study in Italy¹⁷ has shown that children with persistent upper airway obstruction might be due to inflammation as allergen stimulation increases the risk of mild tonsillar hypertrophy but decreases the risk of severe tonsillar hypertrophy (grades 3 and 4). The turbinate hypertrophy possibly in allergic rhinitis can prevent allergens from reaching the tonsils and stimulate further hypertrophy.¹⁷

The nasal endoscopic examination provides a more detailed evaluation of the nasal cavity than the anterior rhinoscopy.^{1,18} Nasal

endoscopic examination in this study showed inferior turbinate hypertrophy (82%) and clear secretions (78%), and these numbers are lesser found in physical examination. The limited scope of anterior rhinoscopy might explain these differences compared to nasal endoscopy. The examination of anterior rhinoscopy and nasal endoscopy were done on different days, which allowed the symptoms to improve or worsen, and symptoms of allergic rhinitis may appear intermittently. Nasal endoscopic examination in this study included an assessment of the osteomeatal complex. There was hypertrophy of the middle turbinate (20%), edema of the uncinate process (42%), and narrowing of the middle meatus (36%) that could play a role in the mechanism of chronic rhinosinusitis by impairing the drainage of the frontal, maxillary, and anterior ethmoid sinuses.¹⁹ Nasal endoscopy can also be performed to detect comorbidities such as adenoid hypertrophy and nasal polyps in patients.¹⁸

Allergic rhinitis must include the detection of comorbidities that can worsen the patient's quality of life if not treated appropriately.^{4,5} The most frequent comorbidity found in this study was chronic rhinosinusitis without nasal polyps (53%), followed by adenoid hypertrophy (23%), asthma (11%), chronic rhinosinusitis with polyps (10%), and chronic suppurative otitis media (3%). A previous study conducted in Bandung, Indonesia, found that rhinosinusitis (50%), nasal polyps (25%), and asthma (10%) were the most prevalent comorbidities.²⁰ Another study conducted in Dar es Salam, Tanzania, showed the most common comorbid was adenoid hypertrophy (31%), followed by nasal polyps (14%), sinusitis (9%), and otitis media with effusion (9%).¹² The high proportion of comorbidities in the present study could be caused by the research location, Dr. Hasan Sadikin General Hospital Bandung, which is a top referral hospital in West Java Province, so patients tend to have more severe diseases. The difference in the proportion of comorbidities in the mentioned studies could be related to geographic factors and the multifactorial nature of the comorbidities.

This research, however, is subject to several limitations. The data presented in this study were taken from medical records dependent on the extent of the physician's assessment of the patients. Nevertheless, some clinical signs of allergic rhinitis were not assessed and therefore not recorded, for examples clinical signs such as adenoid facies, Dennie-morgan

lines, and transverse nasal folds that may be present in allergic rhinitis patients. Another limitation came from the large number of medical records that could not be included in this study. Further studies are suggested to include clinical signs that were not available in this study and to be carried out in a larger population to obtain a more precise result.

To conclude, the clinical signs observed from allergic rhinitis patients may vary with the most common findings including nasal turbinate hypertrophy, pale nasal mucosa, and clear nasal discharge. The findings may help clinicians to diagnose allergic rhinitis needed for therapy management.

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