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Risk Factors for Allergic Rhinitis in Students of SMA Negeri 1 Padang, Indonesia

Rahmat Hidayat[1*], Puspa Sari[2]

[1]Department of Otorhinolaryngology, Dr. M.Djamil General Hospital, Padang, Indonesia

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***Corresponding author:**
Rahmat Hidayat

E-mail address:
rahmathidayat@med.unand.ac.id

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A B S T R A C T

Introduction: Allergic rhinitis (AR) is a disorder of the nasal mucosa caused by inflammation and initiated by a hypersensitivity reaction due to exposure to allergens. This study aimed to determine the risk factors associated with allergic rhinitis in SMA Negeri 1 Padang Indonesia students. **Methods:** This study was an observational study with a cross-sectional approach. A total of 500 research subjects participated in this study, and the research subjects met the inclusion criteria. The inclusion criteria were SMA Negeri 1 Padang, Indonesia students aged 15-17 years and willing to participate in the research as evidenced by the consent of their parents or guardians to participate in this study. Data analysis was carried out using SPSS software version 25. Univariate analysis was performed to present the frequency distribution of each variable test. Bivariate analysis was performed to determine the relationship between risk factors and incidence of rhinitis allergies, $p < 0.05$. **Results:** The results of the study show that gender is not related to the incidence of rhinitis allergies. Smoke exposure, owning pets, dust exposure, and a history of atopy are associated with events of rhinitis allergies, $p<0.05$. **Conclusion:** Smoke exposure, owning pets, dust exposure, and a history of atopy are risk factors for this incidence of allergic rhinitis in SMA Negeri 1 Padang, Indonesia students.

1. Introduction

Allergic rhinitis (AR) is an inflammatory process in the nasal mucosa which is initiated by a hypersensitivity reaction due to allergen exposure mediated by immunoglobulin E (IgE). Some of the typical symptoms of RA are nasal congestion, runny or runny nose (rhinorrhea), itching of the nose, and sneezing. The incidence of AR can be triggered by contact with allergens. Several allergens that can cause AR symptoms are often found both in the home and outside the home, including house dust mites, flower pollen, and fur or hair from pets.[1-5]

As many as 400 million populations in the world suffer from allergic rhinitis, and it is estimated that the incidence will always increase. The prevalence of children aged 15-17 years with allergic rhinitis ranges from 1.4% to 39.7% of the world's population. The incidence of allergic rhinitis in low- and middle-income Asia Pacific countries is 5 – 45% of the total population. According to a study, 66.4% of patients with allergic rhinitis were aged 10-29 years, and 45.1% of them were students. Risk factors for allergic rhinitis are a family history of atopy, high exposure to cigarette smoke and vehicle fumes, having pets, and exposure to dust. A history of growth and development and childhood illnesses are also risk factors for RA, such as vitamin D deficiency, childhood respiratory diseases, and childhood food allergies.[6-11] This study aimed to determine the risk factors associated with allergic rhinitis in SMA Negeri 1 Padang, Indonesia students.

2. Methods

This study was an observational study with a cross-sectional approach and used primary data from structured interviews with research subjects. A total of 500 research subjects participated in this study, and the research subjects met the inclusion criteria. The inclusion criteria were SMA Negeri 1 Padang Indonesia students aged 15-17 years and willing to participate in the research as evidenced by the consent of their parents or guardians to participate in this study. This study was approved by the medical and health research ethics committee at Dr. M. Djamil General Hospital, Padang, Indonesia.

Observation of sociodemographic data, risk factors, and clinical rhinitis allergy was performed in this study. In addition, observation of risk factors for allergic rhinitis, such as exposure to smoke, house dust, and a history of atopy, were explored in this study. Data analysis was carried out using SPSS software version 25. Univariate analysis was performed to present the frequency distribution of each variable test. Bivariate analysis was performed to determine the relationship between risk factors and incidence of allergic rhinitis, $p < 0.05$.

3. Results and Discussion

Table 1 presents the risk factors associated with allergic rhinitis. The results of the study show that gender is not related to the incidence of rhinitis allergies. Smoke exposure, owning pets, dust exposure, and a history of atopy are associated with the incidence of allergic rhinitis, $p<0.05$.

Table 1. Risk factors associated with allergic rhinitis.

Variable	Allergic rhinitis	No allergic rhinitis	p-value*	PR(95%CI)
Gender				
Male	85	125	0,32	1,01(0,42-5,43)
Female	126	164		
Smoke exposure				
Yes	80	75	0,01	2,05(1,18-2,59)
No	131	214		
Have pets				
Yes	87	98	0,03	1,61(1,02-6,45)
No	124	191		
Dust exposure				
Yes	92	105	0,03	1,72(1,03-7,87)
No	119	184		
History of atopy				
Yes	86	91	0,03	2,11(1,51-8,65)
No	125	198		

*Chi-square test, p<0,05.

The results of this study indicate a fairly high prevalence of allergic rhinitis of around 42.2%. This is the impact of lifestyle changes which are then associated with the theory of Th1 and Th2 balance. Good hygiene and sanitation make the body less exposed to infectious agents such as bacteria and viruses.[12-15] This situation resulted in the body's immune response by Th1 being less activated and the body's immune response by Th2 cells becoming more dominant. Predominant Th2 cells are characterized by increased mast cell, eosinophil, and IgE response to allergens. This condition is associated with triggering type 1 hypersensitivity reactions such as asthma, allergic rhinitis, eczema, and urticaria.[16-18] Display Smoke contains molecules that can increase oxidative stress, increase mucosal inflammation and increase cytokine production pro-inflammatory such as IL-8, IL-6, and TNF-α. The cellular effects caused by smoke are increased permeability, impaired mucociliary clearance, and excessive mucus production that trigger the incidence of rhinitis allergies.[19-21]

4. Conclusion

Smoke exposure, owning pets, dust exposure, and a history of atopy are risk factors for this incidence of

allergic rhinitis in SMA Negeri 1 Padang, Indonesia students.

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