

Prevalence of Allergic Rhinitis based on World Health Organization (ARIA-WHO) questionnaire among Batch 2010 Students of the Faculty of Medicine Universitas Padjadjaran

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Abstract

Background: Allergic rhinitis (AR) is a common disease affecting 5–45% of Asian population. Although it is not a life-threatening disease, AR significantly hampers the quality of life of the sufferers. The prevalence of AR among adults in Indonesia is still unknown. This study aimed to measure the prevalence of AR among batch 2010 students of the Faculty of Medicine, Universitas Padjadjaran.

Methods: A cross-sectional study was conducted during June–October 2013 involving Indonesian class batch 2010 students of the Faculty of Medicine, Universitas Padjadjaran. The sampling was performed using total sampling approach. The measurement tool used in this study was the Indonesian translation of the Allergic Rhinitis and its Impact on Asthma-World Health Organization (ARIA-WHO) questionnaire. Those who were aware of being diagnosed with AR or had two/more AR defining symptoms in the questionnaire form were considered to have AR. The statistical analysis was conducted by calculating frequencies.

Results: A total of 207 questionnaire forms were adequately filled out and returned. Based on the questionnaire, the prevalence rate of AR was 38.2%. Of the 79 AR cases, 66% cases involved females. In addition, 54% of the the AR cases have a parental history of allergic diseases. Nasal obstruction and itchy nose were the most frequent symptoms (90%), followed by rhinorrhea (89%), sneezing (82%), and eye symptoms (62%). Based on the duration, the majority fell into the intermittent group (91%); whereas based on severity, the majority was in the moderate-severe group (71%).

Conclusions: The prevalence rate of AR obtained in this study is within the estimated range of Asian population. [AMJ.2015;2(4):620–5]

Keywords: Allergic rhinitis, prevalence, questionnaire

Introduction

Allergic rhinitis (AR) is a common disease defined as a symptomatic disorder of the nose resulting from IgE-mediated inflammation of the nasal membranes after allergen exposure.¹ Frequent allergens include pollens, moulds, animal dander, and dust mites. The AR is characterized by rhinorrhea (watery runny nose), sneezing (especially violent and in bouts), nasal obstruction, itchy nose, and usually associated with eye symptoms.^{1,2}

The AR can be diagnosed in several steps, consisting of anamnesis, physical examination, and supporting examination. Allergic Rhinitis

and its Impact on Asthma-World Health Organization (ARIA-WHO) has developed a questionnaire as a screening tool for AR.¹ Due to its good validity and high sensitivity, ARIA-WHO questionnaire has been used widely for many studies related to AR.³ Those with the abovementioned classical symptoms of AR are most likely to be allergic. Physical examination can reveal the outward signs of allergy (e.g. allergic crease, allergic shiners, etc) and structural abnormality of the nasal cavities. Furthermore, supporting examinations may include skin-prick test and/or serum-specific IgE, which can confirm the diagnosis of AR.¹

The common symptoms of AR often disrupt

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quality of life including the sleep pattern which may further cause exhaustion, drowsiness, emotional instability, and diminution of performance at the workplace. The AR also has a negative impact on productivity and socioeconomic conditions. According to a survey in the United States, 55% of 8,267 workers stated that AR symptoms had made them unproductive for 3.6 days per year.⁴ World Allergy Organization (WAO) reported that in the United States alone, the indirect financial loss related to low productivity reached up to \$9.7 billion in 2005, whereas the direct financial loss for expenditure on medications and health care provision reached \$11.2 billion.²

The AR patients may develop other comorbidities, some of which include asthma, allergic conjunctivitis, and rhinosinusitis. The comorbidities have always been closely linked with AR, for there are histological and immunological similarities between the upper and lower respiratory tracts. The comorbidities can even be more severe than the disorder and may directly have an unfavorable impact on the quality of life.⁵

Epidemiologically, AR affects 10–30% of world population and the prevalence is still increasing.² According to the 2008 World Allergy Report⁶, the prevalence of AR in the low and middle income countries within Asia-Pacific Region was estimated to be around 5–45%. Unfortunately, the prevalence rate among adults in Indonesia is still unknown. Meanwhile, it is shown that 64.6% of AR patients who visited the Department of Otolaryngology-Head & Neck Surgery, Dr. Hasan Sadikin General Hospital Bandung were between 10 to 29 years old, a relatively productive age group. Besides, it is also found that, based on occupation, 45.1% of the patients were students.⁷

In line with the above explanation, AR is a prevalent devastating disorder that affects primarily young adults. The objective of this study was to measure the prevalence of AR among batch 2010 students of the Faculty of Medicine, Universitas Padjadjaran.

Methods

This study was conducted during June–October 2013 using the cross-sectional method as the study design. The ARIA-WHO questionnaire that had been translated into Indonesian language by an authorized and sworn translator from LIA Language Center and Vocational Training (LBPP LIA)

was used. The population of this study was obtained from batch 2010 students of regular class of the Faculty of Medicine Universitas Padjadjaran. The sampling was total sampling. There were thus a total of 207 respondents invited to participate as the subjects in this study. Moreover, ethical clearance of this study was released by the Health Research Ethics Committee of the Faculty of Medicine, Universitas Padjadjaran/Dr. Hasan Sadikin General Hospital Bandung.

All 207 respondents were asked to fill out the ARIA-WHO questionnaire forms. Informed consent was obtained from all participants. The questionnaires were then screened and those who answered yes to any of the AR defining symptoms were shortlisted. Those who were aware of being diagnosed with AR or those who had two/more AR defining symptoms (rhinorrhea, sneezing, nasal obstruction, and itchy nose) were considered to have AR.

The screened AR cases were subsequently classified based on some commonly observed characteristics including sex, parental history, symptoms, and ARIA-WHO classifications. Eventually, the statistical analysis was performed by calculating frequencies.

Results

All 207 respondents in this study filled out the questionnaire forms adequately. This study revealed that the prevalence of AR among respondents were 79 out of 207 respondents (38.2%), of which more than 60% cases involved female respondents. In addition, more than half of the AR cases have a parental history of allergic diseases (Table 1).

The AR cases were then classified according to the symptoms that they have or a history of suffering the disease. They might have chosen one or more symptoms provided in the ARIA-WHO questionnaire forms. This study revealed that the most frequent symptoms were nasal obstruction and itchy nose, followed by rhinorrhea, sneezing, and eye symptoms (Table 2).

Furthermore, the prevalence of AR among respondents was categorized according to ARIA-WHO classification. Based on the duration of the symptoms, the AR cases were divided into intermittent and persistent groups; whereas based on the quality of life hampered, they were divided into mild and moderate-severe groups. This study revealed that the majority of the cases were classified as intermittent based on the duration of the symptoms and moderate-severe based on the

Table 1 Characteristics of Respondents

Characteristics	Allergic Rhinitis (n=79)	Non Allergic Rhinitis (n=128)
Sex		
Male	27 (34%)	50 (39.1%)
Female	52 (66%)	78 (60.9%)
Parental history		
Mother or father	34 (43%)	14 (10.9%)
Both parents	9 (11%)	2 (1.6%)
No history	36 (46%)	112 (87.5%)
Total	79 (38.2%)	128 (61.8%)

quality of life hampered (Table 3).

Discussion

It was found that the prevalence rate of allergic rhinitis (AR) among respondents in this study was 38.2%, which is within the estimated range for Asian population. World Allergy Report 2008 reported that in many parts of Asia, especially in low- and middle-income countries, the prevalence rate of AR has increased from 5% to 45% as the society is being modernized.⁶ However, it was found that the actual number varied between countries. For example in the Philippines, the overall prevalence of AR among adults based on the 2008 National Nutrition and Health Survey was 20.0%.⁸ Another study conducted in Jaipur City, India showed that the prevalence of AR among school-children there was 33.5%.⁹ Meanwhile, the result obtained in this study was actually slightly higher than the estimated range of the global population. The WAO reported that AR is a common disease affecting an estimate of 10–30% population globally.²

Until recently, the prevalence rate of AR among adults in Indonesia is still unknown. In

Bandung, however, there were 7% perennial AR cases in the age group of more than 10 years old.¹⁰ The discrepancy of the result obtained in the current study compared to the global estimate can be due to the study design used. This study was a questionnaire only-based survey. The ARIA-WHO questionnaire has actually been widely used as a screening test for AR in many studies due to its high sensitivity. A study conducted in Korea concluded that the questionnaire showed better validity compared to the conventional ones.³ However, it was found that the specificity of the questionnaire was not really high, so there might be many false positives included in the results.¹¹ Thorough examinations comprising physical examination and diagnostic testing would yield a better and more accurate result.¹

Another result of this study was the fact that the prevalence of AR among female respondents and male respondents was 66% and 34%, respectively. This is relevant to a study done by Asha'ari et al.¹² who found that 61.1% of newly-diagnosed AR cases in Malaysia involve female patients. Likewise, some studies conducted in Dr. Hasan Sadikin General Hospital Bandung also present similar

Table 2 Frequency of the Identifiable Symptoms

Identifiable symptoms	Number of respondents (percentage)
Nasal obstruction*	71/79 (90%)
Itchy nose	71/79 (90%)
Rhinorrhea**	70/79 (89%)
Sneezing#	65/79 (82%)
Eye symptoms##	49/79 (62%)

Note: The respondents may have chosen more than 1 symptom provided in the ARIA-WHO questionnaire. *Feeling of being unable to breathe through nose **Watery, runny nose #Violent and in bouts ##Watery, red itchy eyes

Table 3 Prevalence of Allergic Rhinitis based on ARIA-WHO Classification

Classification	Number of cases (percentage)
Based on duration	
Intermittent*	72 (91%)
Persistent**	7 (9%)
Based on quality of life hampered	
Mild#	23 (29%)
Moderate-severe##	56 (71%)
Total	79 (100%)

Note: *Intermittent: <4 days/week or <4 consecutive weeks **Persistent: >4 days/week or >4 consecutive weeks #Mild: Normal sleep and no impairment of daily activities, normal work or school, no troublesome symptoms ## Moderate-severe: One or more: abnormal sleep, impairment of daily activities, abnormal work or school, troublesome symptoms.

findings, Sudiro¹³ found that 55.3% of the AR cases involved female and, one year later, Syukrie⁷ found 61.0% also involved female patients. Moreover, 60.3% of AR cases detected among citizens in Taif, Saudi Arabia¹⁴ involved females as well. Hence, the high proportion of AR cases among women should be analyzed further to assess whether they are more prone to have AR compared to men. The result showing more female cases in this study could be due to the disproportionate distribution of the subjects. A total of 130 (62.8%) female subjects out of the 207 respondents were invited to participate in this study, so the result in this study could have been exaggeratedly reported in this regard.

In the present study, more than half of the AR cases have a parental history of allergic diseases, such as asthma, atopic dermatitis, or AR itself. A Western Europe-based survey in 2004 showed that there were 68.1% of AR diagnosed patients who reported of having a family history of any allergic conditions.¹⁵ Asha'ari et al.¹² also found that 54.4% of AR patients in Malaysia had a family history of allergic diseases. Meanwhile, Syukrie⁷ found that 50.4% of AR patients in Dr. Hasan Sadikin General Hospital Bandung also had a positive family history. It has long been known that the genetic background is one of the most important factors for developing any allergic diseases.¹ A child with one atopic parent would possess a 30% risk of having allergic diseases, whereas a child with both atopic parents would possess an additional 20% risk.¹⁶ Furthermore, a study conducted by Tamay et al.¹⁷ in Istanbul, Turkey showed that a child with a positive family history carried a greater risk for developing AR.

The present study applied the ARIA-WHO

guidelines to define the diagnostic criteria for AR, which are characterized by having two or more nasal symptoms.⁹ Other conditions that can be presence include eye symptoms.

The ARIA-WHO questionnaire makes it possible for the respondents to choose more than one symptom that they have or have a history of suffering from. Long¹⁸ conducted a survey on 1,000 AR patients and found that the majority experienced nasal obstruction (85%), followed by sneezing (63%), eye itchiness (60%), rhinorrhea (56%), watery eyes (51%) and nasal itchiness (41%). Saini,⁹ on the other hand, found that the most frequent symptom was nasal obstruction (48.6%), followed by rhinorrhea (33.0%), sneezing (24.1%), and itchy nose (20.3%). Another study conducted in Boshroye, Iran¹⁹ found that rhinorrhea was the most prevalent symptom among atopic group (33%), followed by sneezing (33%), nasal obstruction (28.8%), itchy nose and eyes (18.0%), and other eye symptoms.

In the present study, however, it was revealed that nasal obstruction and itchy nose were the highest presenting symptoms (90%), followed by rhinorrhea (90%), sneezing (82%), and eye symptoms (62%). The discrepancy of each study is most likely due to common variations of symptoms within AR patients.

The ARIA-WHO guidelines were also used as the classification system based on the duration of the symptoms and the quality of life hampered.¹ The majority of the AR cases in some of the previous studies fell into persistent group.^{7,12} Interestingly, more than 90% of the AR cases in the present study were in the intermittent group, similar to a study carried out in Jaipur City, India,⁹ although in a much lower percentage. This contrast is most likely due to the different subjects involved

in each study. The aforementioned studies involved AR patients who came to the hospital, and there would be a high possibility that they had persistent symptoms so they needed immediate medical interventions. This could also be due to the inconsistency in filling out the questionnaire form. The respondents might not be aware that the symptoms they encountered were in fact more long-lasting.

Based on the quality of life hampered, the majority of the AR cases fell into the moderate-severe group, which is similar to most studies.^{7,9,12} Moderate-severe is characterized by several conditions such as abnormal sleep, impairment of daily activities, abnormal work/school, or troublesome symptoms.¹ The respondents who participated in this study were students who stay mostly in Bandung and nearby areas, in which the weather and humidity are suitable for the growth and development of dust mites, commonly *Dermatophagoides pteronyssinus* (Der p).¹ Therefore, it is probable that the subjects have been frequently exposed to the dust mite species. Furthermore, the subjects involved in this study were all students and relatively do not have time to do sports or exercises and thus increases the risk to hamper their quality of life. It is known that doing a regular exercise could balance the type 1 and type 2 T helper cells (also known as Th1 and Th2 cells, respectively) so the hypersensitivity effect would be less severe.²⁰

In conclusion, the prevalence rate obtained in the present study is within the estimated range of Asian population. Some of the characteristics of the AR cases, including sex, parental history, and ARIA-WHO classification were also considered to be relevant to most studies. Since this was a questionnaire only-based survey, further studies that include thorough examinations including physical examination and diagnostic testing would yield a better result on this matter.

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