# Prevalence of Allergic Rhinitis and Types of Sensitized Allergen in Adult at Wat Intaram Community, Hua Raeu, Phra Nakhon Si Ayutthaya District, Phra Nakhon Si Ayutthaya Province, Thailand

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*Allergic rhinitis is a common problem in many countries. The incidence of Allergic rhinitis is about 10-25% of the population and increasing worldwide especially in large cities where air pollution is the main problem causing respiratory illness. In Thailand, the surveys of allergic rhinitis on children were found about 13-44% while the prevalence of allergic rhinitis in Thai adults was as high as 20%. The information of the prevalence of Allergic rhinitis in the suburban area has not been continuously done especially in the adult population.*

***Objective:*** *To present study the prevalence of allergic rhinitis and other atopic diseases and to determine the aeroallergen sensitivity of allergic patients in suburban area.*

***Material and Method:*** *Observational descriptive cross-sectional Study as one-stage cluster sampling, Using ISAAC questionnaires interviewed adults at Wat Intaram community, Hua Raeu, Phra Nakhon Si Ayutthaya District, Phra Nakhon Si Ayutthaya Province, Thailand during September-October 2008. Participants who had allergic rhinitis symptoms described in the questionnaires were enrolled to perform the skin prick test voluntary to determine the aeroallergen sensitivity.*

***Results:*** *There were 324 subjects, female 64.8% and male 35.2%. Age ranges between 20-66 years old (mean 42.2). The prevalence of allergic rhinitis, asthma and chronic pruritic rash were 37.7%, 16%, 21.3% and history of allergic rhinitis, asthma and chronic pruritic rash within 12 months were 32.1%, 10.5%, 17.3%. The sensitized allergen was Mixed mite (62.2%), Mixed cockroach (61.1%), House dust (48.9%), Cat (37.8%), Johnson glass (30.0%), Dog (20.0%), Careless weed (20.0%), Mixed mold (12.2%), Cotton (7.8%) and Feather (6.7%).*

***Conclusion:*** *The present study revealed that the prevalence of allergic rhinitis and atopic diseases has been increasing in number when compared with previous reports. The most common sensitized allergen was Mite mix, similar to other studies, but Mixed cockroach was found significantly higher.*

***Keywords:*** *Allergic rhinitis, Prevalence, Skin prick test, Allergen*

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Allergic rhinitis is commonly found in many countries and clinically defined as a symptomatic disorder induced after allergen exposure by an immunoglobulin E mediated inflammation of the nasal mucosa. The resulting symptom complex includes sneezing, rhinorhoea, nasal congestion and itching. This condition which can significantly affect the quality of life, school performance, work productivity may exacerbate comorbidities such as asthma and sinusitis. The diagnosis tends to relay on patient's history and could confirm by IgE mediated response via skin prick test or serum specific IgE, however these tests are not performed routinely.

The skin prick test is safe, reliable and recommended as the method of choice to confirm

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diagnosis of specific allergen by the European Acadamy of Allergology and Clinical Immunology (EAACI).

In children and adolescents, the International Study of Asthma and Allergies in Childhool (ISSAC) written questionnaires have been widely used in epidemiologic studies to identify the prevalence of allergic rhinitis with high sensitivity and specificity when compared with the skin prick test.

The incidence of allergic rhinitis is about 10-25% of population[1,2], up to 40% in children[3,4] and increasing worldwide especially in large cities where air pollution is the main problem causing respiratory illness. In Thailand, the surveys of allergic rhinitis on children found about 13-44%[5,6,16,17] while the prevalence of allergic rhinitis in Thai adults were as high as 20%[7,8]. The most common sensitized allergens are House dust, Mites and Cockroaches[9-11].

As the authors knew that Allergic rhinitis were increasing in developing countries due to the changing environmental status and the information of the prevalence of Allergic rhinitis in the suburban area has not been continuously done especially in an adult population.

Phra Nakhon Si Ayutthaya District, Phra Nakhon Si Ayutthaya Province, Thailand is a crowded middle class community, located in suburban area, central part of Thailand. And this District is the present study field of the fifth year medical students, PMK College of Medicine to practice about Family Medicine. Therefore, it is interesting to conduct the research about these in order to provide data for preventive strategy management of allergic rhinitis in this community.

The objectives were to study the prevalence of allergic rhinitis and other atopic diseases and to determine the aeroallergen sensitivity of allergic patients in an adult population at Phra Nakhon Si Ayutthaya District, Phra Nakhon Si Ayutthaya Province, Thailand.

## Material and Method

The observational descriptive cross-sectional study was designed as one-stage cluster sampling from 7 villages in Hua Raeu, Phra Nakhon Si Ayutthaya District and random sampling for a village (Wat Intraram community) approximately to be 300 volunteers in a survey by using ISAAC referred questionnaires[12] interviewed adults aged more than 18 years old during September-October 2008. Written informed consent was obtained in every case before the conduct of any study-related procedures.

All participants completed a questionnaire in which they were asked about allergic rhinitis, asthma and allergic skin disease. The participants were excluded from the present study if they had severe systemic diseases such as immuno-compromised host, cancers, pregnancy, immunotherapy, corticosteroid using within a month and antihistamine within a week before the interview.

Participants who had a history of allergic rhinitis symptoms (sneezing, itching, watery rhinorhoea) described in the ISAAC referred questionnaires were enrolled to perform the skin prick test voluntary to determine the aeroallergen sensitivity of allergic patients. 10 common allergenic extract (Greer Laboratories, USA) were selected according to aeroallergens in Thailand which composed of 7 indoor allergen (House dust 10,000 PNU/ml, Mixed mite (D. pteronyssinus and D. farinae) 10,000 AU/ml, Mixed cockroach (German and American cockroach) 1:20 w/v, Epidermal cat 10,000 AU/ml, Epidermal dog 1:20 w/v, Mixed feather 1:20 w/v, Cotton 1:20 w/v and 3 outdoor allergen (Mixed mold 1:10 w/v, Johnson grass 1:20 w/v, Careless weed 1:20 w/v). Histamine dihydrochloride (1 mg/ml) and 50% glycerine were used as positive and negative control. A standard skin prick test was performed on the flexor aspect of the left or right forearm and wait for 20 minutes before interpreting the result of the skin test. A positive allergen skin prick test was considered if the wheal was more than 3 mm with surrounding erythema[13-15]. Statistical analysis was descriptive and all values were expressed as frequency and percentages.

## Results

There were 324 subjects in the present study. 210 (64.8%) of the subjects were female and 114 (35.2%) were male. Age ranged between 20-66 years and mean age was 42.2 year old.

From ISAAC referred questionnaires, the prevalence of allergic rhinitis was determined by having a history of nasal symptoms (sneezing, itching, rhinorhoea) and history of nasal symptoms within last 12 months 37.7%, 32.1% respectively. The prevalence of co-morbid eye itching was found 18.8%. In this group, 16.0% had a mild degree of allergic rhinitis (disturbed a little daily activity) and 5.6%, 3.1% were moderate and severe degree.

The prevalence of asthma was determined by ever having a history of wheeze and history of wheeze within last 12 months 16%, 10.5% respectively. 1.8% had wheeze more than 4 times per year, 6.2% had a history of night cough and 4.3% had a history of

dyspnea at night and 1.9% had severe asthma.

The prevalence of allergic skin disease was determined by a history of chronic pruritic rash and history of chronic pruritic rash within the last 12 months 21.3%, 17.3% respectively (Table 1). 24.4% of participants had only one allergic disease, 13.6% had two allergic diseases and 2.8% had three allergic diseases (allergic rhinitis, asthma, eczema).

Ninety subjects who had a history of allergic rhinitis symptoms consented to conduct a skin prick test voluntary. 88.89% was positive allergen skin prick test and 11.11% was negative allergen skin prick test.

The respective results of the allergen skin prick test showed the following percentages of reactive allergen: Mixed mite (62.2%), Mixed cockroach (61.1%), House dust (48.9%), Cat (37.8%), Johnson grass (30.0%), Dog (20.0%), Careless weed (20.0%), Mixed mold (12.2%), Cotton (7.8%) and Feather (6.7%) (Fig. 1).

The degree of positive allergic reaction to each allergen (positive 3 + reaction = wheal more than 3 mm with surrounding erythema, positive 4+ reaction = wheal more than 3 mm with pseudopod) is shown in Fig. 2.

The frequency of positive allergen skin prick test in each subject were 2 allergens (24.44%), 1 allergens (14.44%), 3 allergens (13.33%), 4 allergens (11.11%), 5 allergens (8.89%), 6 allergens (7.78%), 7 allergens (5.56%), 8 allergens (2.22%) and 10 allergens (1.11%) (Fig. 3).

## Discussion

The present study used the International Study of Asthma and Allergies in Childhood (ISAAC) questionnaires to figure out the prevalence of asthma, atopic dermatitis and allergic rhinitis in adult at Wat Intaram community, Hua Raeu, Phra Nakhon Si Ayutthaya District, Phra Nakhon Si Ayutthaya Province, Thailand. The ISAAC questionnaires were accepted worldwide with internaltional approval to provide high

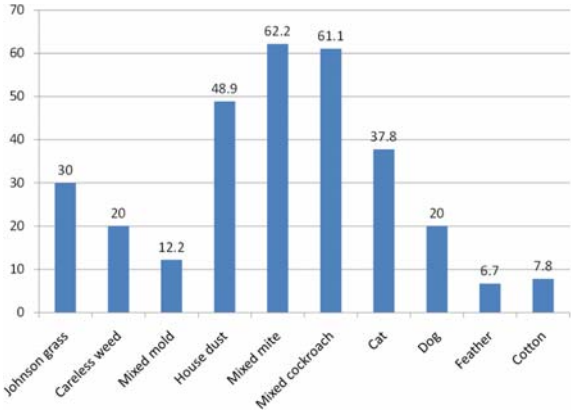


**Fig. 1** shows percentage of positive allergic reaction to 10 allergens from skin prick test

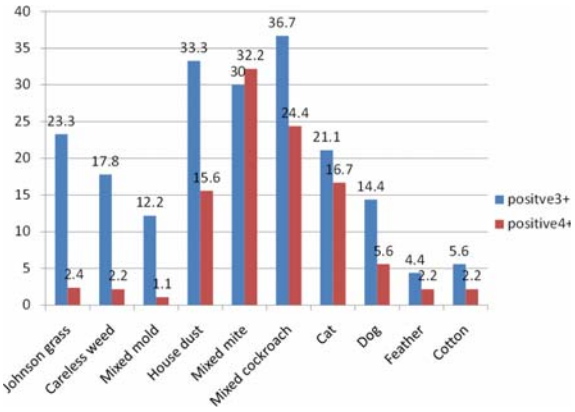


**Fig. 2** shows degree of positive allergic reaction to each allergen (positive 3+ reaction = wheal more than 3 mm with surrounding erythema, positive 4+ reaction = wheal more than 3 mm. with pseudopod)

**Table 1.** showed prevalence of AR, asthma, chronic pruritic rash from ISSAC questionnaires

| Atopic diseases | Symptoms | Numbers | | | SD |
|---|---|---|---|---|---|
| | | Male (n = 114) | Female (n = 210) | Total (n = 324) | |
| Allergic rhinitis | Ever symptoms | 38 (33.33%) | 84 (40%) | 122 (37.7%) | 0.485 |
| | Symptom within last 12 months | 32 (28.1%) | 72 (34.3%) | 104 (32.1%) | 0.497 |
| Asthma | Wheeze ever | 22 (19.3%) | 30 (14.3%) | 52 (16.0%) | 0.368 |
| | Symptom within last 12 months | 14 (12.3%) | 20 (24.69%) | 34 (10.5%) | 0.442 |
| Eczema | Ever pruritic rash | 15 (13.16%) | 54 (25.71%) | 69 (21.3%) | 0.410 |
| | Rash within last 12 months | 11 (9.6%) | 45 (45.92%) | 56 (17.3%) | 0.492 |

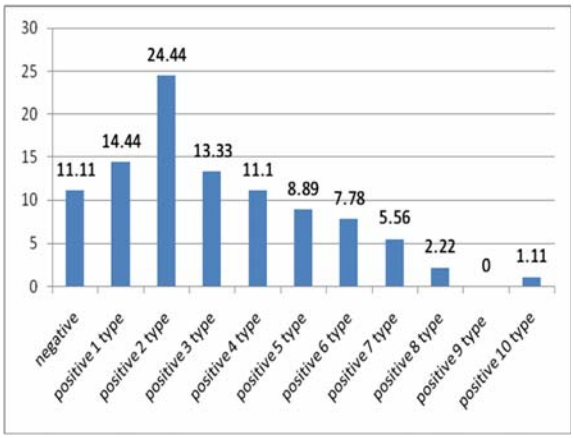


**Fig. 3** shows the frequency of positive allergen skin prick test in each subjects

sensitivity (42.7%), specificity (97.6%) compared with standard skin prick test. From the questionnaire, the authors found the prevalence of allergic rhinitis, asthma and chronic pruritic rash were 37.7%, 16%, 21.3% respectively and history of allergic rhinitis, asthma and eczema within the last 12 months were 32.1%, 10.5%, 17.3% respectively. It was the same as reports using ISAAC questionnaires from Teeratakulpisarn which found the prevalence of allergic rhinitis, asthma and eczema in school children 42.6%, 14.3% and 27.8% and history of allergic rhinitis, asthma and eczema within 12 months 33.3%, 9.8% and 11.2% respectively[16] and Saengsiriwut reported the prevalence of allergic rhinitis, asthma and eczema in children 44.3%, 7.7% and 4.1% respectively and history of allergic rhinitis, asthma and eczema within the last 12 months 35.7%, 7% and 8.5% respectively[17]. These have shown that the allergic rhinitis is itself a common disease in adults as well as in children comparing with the others revealed the prevalence of allergic rhinitis in Thailand (13-44%)[5-8]. The present study in Wat Intaram community seems to have a higher incidence due to changing environment with increased air pollution in the crowded cities as well as in many counties. It is believed this may correlate with higher allergens such as House Dust, Mold, Cockroach and irritative agents in the air causing allergic rhinitis and its related conditions.

Skin prick test is safe and reliable and can be used as the gold standard in order to confirm diagnosis of allergy. In the present study, 90 cases were performed the skin prick test from 324 cases with 79 cases (88.89%) positive allergic reaction. The common positive allergen in the present study were Mixed mite (62.2%), Mixed cockroach (61.1%), House dust (48.9%) and Cat (37.8%). The most common sensitized allergen found from the present study was Mixed mite, similar to studies of Pumhirun, Adirojjananon, Sriburee in Thailand but Mixed cockroach was found significantly higher and has strong reaction (positive 3+, 4+ reaction)[11,18,19], this data is important for preventive strategy of Allergic management to environmental control of the population of cockroach which are found in a crowded community. The present study also showed that the common allergens were House dust, Mite and Cockroach and the less common allergens were Johnson grass (30.0%), Dog (20.0%), Careless weed (20.0%), Cotton (7.8%) and Feather (6.7%). Surprisingly, Mixed mold was found 12.2% less than expected when compared with other reports.

## Conclusion

The present study can conclude that the prevalence of allergic rhinitis and other atopic diseases has been increasing in number when compared with other studies. The most common sensitized allergen found from the result of skin prick test were House dust, Mixed mite and Mixed Cockroach, similar to other studies, but Mixed cockroach was found significantly higher.

The results can provide information for planning a preventive strategy of allergic disease in the community. The advice for the next study is to also do the skin prick test in the subjects with no allergic rhinitis symptoms in order to find the sensitivity and specificity of the questionnaires and skin prick test.

## Potential conflicts of interest

Phramongkutklao Hospital's Foundation under Her Royal Highness Princess Maha Chakri Sirindhorn's Patronage.

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## ความชุกของโรคเยื่อบุจมูกอักเสบจากภูมิแพ้ และชนิดของสารก่อภูมิแพ้ในการเกิดโรคภูมิแพ้ในผู้ใหญ่ในชุมชนวัดอินทราราม ตำบลหัวรอ อำเภอเมือง จังหวัดอยุธยา

***กรัณย์ บุญเจียร, กมลชนก สุขเกษม, ณัชพร นพเคราะห์, ณัฐพล แหยมแก้ว, ดุสิต จันทยานนท์, วีระพล ธีรพันธ์เจริญ, สุรชัย โชคครรชิตไชย, กรีฑา ม่วงทอง***

*โรคเยื่อบุจมูกอักเสบจากภูมิแพ้เป็นโรคที่พบได้บ่อย มีอุบัติการณ์ประมาณร้อยละ 10-25 และมีแนวโน้มสูงขึ้นโดยเฉพาะในเมืองใหญ่ที่มีมลพิษทางอากาศเพิ่มขึ้น แต่ข้อมูลในผู้ใหญ่ในประเทศไทยนั้นมีค่อนข้างน้อยเมื่อเทียบกับการศึกษาในเด็ก จึงเป็นหัวข้อที่น่าสนใจในการหาความชุกของโรคนี้ของกลุ่มประชากรผู้ใหญ่ในเขตเมืองเพื่อนำข้อมูลที่ได้ไปใช้ในการป้องกันและรักษาโรคนี้ต่อไป*

***วัตถุประสงค์:*** *เพื่อหาความชุกของโรคเยื่อบุจมูกอักเสบจากภูมิแพ้และโรคภูมิแพ้อื่นๆ และหาชนิดสารก่อภูมิแพ้ที่ทำให้เกิดโรคนี้ในผู้ใหญ่ ในชุมชนวัดอินทราราม ตำบลหัวรอ อำเภอเมือง จังหวัดอยุธยา*

***วัสดุและวิธีการ:*** *การวิจัยเชิงพรรณนาแบบเชิงภาคตัดขวางในช่วงเวลาหนึ่ง ทำการสำรวจโดยใช้แบบสอบถาม ISAAC ในกลุ่มประชากรอายุ 18 ปีขึ้นไป ในชุมชนวัดอินทราราม ตำบลหัวรอ อำเภอเมือง จังหวัดอยุธยา และนำผู้ที่มีประวัติเยื่อบุจมูกอักเสบจากภูมิแพ้ที่สมัครใจ มาทำการทดสอบภูมิแพ้ทางผิวหนัง เพื่อหาชนิดของสารก่อภูมิแพ้ที่ทำให้เกิดโรคนี้*

***ผลการศึกษา:*** *ผู้เข้าร่วมวิจัยจำนวน 324 คน ชาย ร้อยละ 35.2 หญิง ร้อยละ 64.8 อายุเฉลี่ย 42.2 ปี พบว่ามีความชุกของอาการทางจมูกอักเสบจากภูมิแพ้, หายใจมีเสียงวี๊ด, อาการผื่นคันทางผิวหนัง ร้อยละ 37.7, 16, 21.3 ตามลำดับ และมีอาการทางจมูกอักเสบจากภูมิแพ้, หายใจมีเสียงวี๊ด, อาการผื่นคันทางผิวหนังใน 12 เดือนที่ผ่านมา 32.1, 10.5, 17.3 ตามลำดับ และผู้ที่มีอาการทางจมูกอักเสบจากภูมิแพ้เข้าร่วมทำ skin prick test 90 คน พบชนิดของสารก่อภูมิแพ้ได้แก่ mixed mite ร้อยละ 62.2, mixed cockroach ร้อยละ 61.1, house dust ร้อยละ 48.9, Cat ร้อยละ 37.8, Johnson grass ร้อยละ 30, Dog ร้อยละ 20, careless weed ร้อยละ 20, mixed mold ร้อยละ 12.2, cotton ร้อยละ 7.8, และ feather ร้อยละ 6.7 .*

***สรุป:*** *การสำรวจความชุกของโรคเยื่อบุจมูกอักเสบจากภูมิแพ้ และโรคภูมิแพ้อื่นๆโดยใช้แบบสอบถาม ISAAC ในชุมชนวัดอินทราราม ตำบลหัวรอ อำเภอเมือง จังหวัดอยุธยา ในประชากรอายุ 18 ปีขึ้นไป พบความชุกของโรคดังกล่าวสูงขึ้น ส่วนสารก่อภูมิแพ้พบ mixed mite มากที่สุดเหมือนกับงานวิจัยอื่นๆ แต่พบ mixed cockroach สูงขึ้น*