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Role of Allergy in Nasal Polyps of Thai Patients

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SUMMARY **As distinct from many countries, allergy in Thailand is of the perennial type which may play a role in the formation of nasal polyps. Forty consecutive patients with nasal polyps and 30 normal subjects as control were studied at the Allergy Clinic, Department of Otolaryngology, Pramongkutklao Hospital. A positive clinical history and skin allergy testing are diagnostic criteria for allergy. In the nasal polyps group, these were 28 males and 12 females, aged between 12-65 years, with an average age of 38.5 years. In the control group, there were 18 males and 12 females, aged between 15-53 yeas, with an average age of 34 years. All had received prick skin testing with 6 common aeroallergens. The prick skin test was considered positive when the wheal was ≥ 3 mm with surrounding erythema. Twenty-four of 40 patients (60%) with nasal polyps had a positive prick skin test, while 6 in the 30 control cases (20%) had a positive prick skin test. This difference was statistically significant (P = 0.0019), Odd's ratio = 6.0 which means allergic persons were 6 times more prone to have polyps form than normal persons.**

Nasal polyps occur in association with a variety of chronic diseases including perennial allergic rhinitis, cystic fibrosis, asthma, chronic sinusitis and aspirin intolerance.[1] Controversy about the etiology of nasal polyps has centered in recent years on the relation of nasal polyps and allergy, especially atopic allergy. It seems likely that nasal polyps in atopic and non-atopic individuals may have different etiologies but there is no doubt that chronic inflammation is a cause of nasal polyps. In Thailand, allergy is of the perennial type[2] and should be related to nasal polyps as one of the contributing factors.

However, studies to date have not been helpful in elucidating the pathogenic mechanism of nasal polyp formation. This study was undertaken to evaluate nasal polyp patients by assessing the relationship to allergy by prick skin test and correlating the result with the clinical symptoms.

MATERIALS AND METHODS

Subjects

Forty patients with nasal polyps (28 males and 12 females with ages ranging from 12-65 years, mean 38.5) and 30 control cases, without nasal masses and no contraindication for skin prick test were randomized selected (18 males and 12 females with ages ranging from 15-53 years, mean 34), were studied at the Out-patient Department, Department of Otolaryngology, Pramongkutklao Hospital. Complete history taking including allergic condition and physical examination were performed on each patient.

Procedure

All subjects were instructed to cease intake of antihistamine for

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72 hours prior to the prick skin test. Allergenic extracts were selected according to aeroallergens in Thailand.[3-5] The allergenic extracts were 1:20 w/v for indoor allergens (house dust, American cockroach, German cockroach), 10,000 AU/ml for indoor allergens (*D. farinae*, *D. pteronyssinus*), by Greer Laboratories, Inc., USA. Histamine phosphate (1 mg/ml) was used as positive control, and glycerine saline as a negative control. The tests should be read in 20 minutes.[6] Prick skin test is considered positive when the wheal is ≥ 3 mm with surrounding erythema.

Statistical methods

Statistical analyses used were two-tailed *t*-test and Odd's ratio.

RESULTS

Based on the questionnaires, all patients with nasal polyps gave positive histories of allergic symptoms and 19 (48%) had positive family histories of allergy. Sixteen patients had sinusitis, 2 patients had deviated nasal septum and 1 patient had left maxillary mucocele. Prick skin test results were positive among 24 (60%) of 40 patients. The allergens tested are followed by the percentage of patients with positive skin test: house dust, 40%; house dust mites, 45%; (*D. farinae*, 35% and *D. pteronyssinus*, 30%); cockroach, 25% (C. Mix, 25%; C. American, 20% and C. German 20%) (Table 1).

In the control group, based on questionnaires, 11 (36.67%) gave positive histories of allergy and 10 (33.33%) gave positive family histories. Five patients were found to have deviated nasal septum. Prick skin test results were positive among 6 (20%) of 30 cases. The allergens tested are followed by the percentage of case with positive skin test: house dust, 10%; house dust mites, 14.33% (*D. farinae*, 10% and *D. pteronyssinus*, 6.67%); cockroach, 6.67% (C. mix, C. American and C. German were 3.33% each) (Table 1).

DISCUSSION

The true incidence of nasal polyps in the general population is difficult to determine and is reported at about 1-4%.[7,8] Others have mentioned that 1-20 per 1,000 of adult population had nasal polyps at some time in their lives.[9] In Thailand, the incidence of nasal polyps was 0.8-2%.[10-12] The incidence of allergy in patients with nasal polyps varies

Table 1 Positive prick skin test results

Allergen	No. of positive (%)	
	Study (n=40)	Control (n=30)
Indoor allergens	24 (60)	6 (20)
House dust	16 (40)	3 (10)
House dust mites	18 (45)	4 (14.3)
D. farinae	14 (35)	3 (10)
D. pteronyssinus	12 (30)	2 (6.7)
Cockroach	10 (25)	2 (6.7)
C. Mix	10 (25)	1 (3.3)
C. American	8 (20)	1 (3.3)
C. German	8 (20)	1 (3.3)

Table 2 Statistical analysis

	Case	Control	Total
Positive skin test	24	6	30
Negative skin test	16	24	40
Total	40	30	70

Odds ratio (OR) = ad/bc = 24x24/6x16 = 6.00
Attributable fraction (AF) = ([OR-1]/OR) x 100 = 83.33%
Two-tailed p-value = 0.0019

from 10-96.5%.[13-16] Numerous hypotheses have been formulated to explain the cause of nasal polyps. Allergy and inflammation are the most plausible, widely discussed theories. Other theories are aspirin intolerance, vasomotor imbalance, dysfunction of autonomic nervous system of the nose, abnormality of carbohydrate metabolism, cystic fibrosis, virus theory, nasal mastocytosis and genetic causes. Although the etiology of nasal polyps is still not clearly understood, three factors which should be emphasized are as follows; 1) chronic repeated inflammation of nasal mucosa and sinus mucosa; 2) abnormality in vasomotor response and 3) result of an increase in interstitial fluid pressure and edema of nasal mucosa.[17] Allergy is type I hypersensitivity known as immediate response. To date, type I hypersensitivity was found to have two types of responses, immediate response and late phase response.[2,18-20] The latter causes prolongation of the inflammatory process, when the process occurs off and on, and will result in chronic repeated inflammation. In Thailand, allergy mostly is of the perennial type and 67.82% are late phase response,[2] as chronic inflammation occurs throughout the year. Criteria for the diagnosis of allergy are a positive history for allergy and a positive skin test.[21] In this study, all patients with nasal polyps gave positive allergic histories and 60% gave positive skin tests. So diagnosis of allergy was made for 60% in the study group and was significantly higher than the control group ($p = 0.0019$). On the other hand, allergic persons were 6 times more likely to have polyps form than normal persons (Odd's ratio = 6.0) (Table 2). In conclusion, nasal polyps of Thai patients had an association with a positive skin prick test (60%), which was significantly higher than the control group.

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