
◎原 著

IgE antibodies against pollinosis-inducing allergens in asthma patients with and without allergic rhinitis

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Abstract : IgE antibodies against inhalant allergens were estimated in 53 patients with bronchial asthma in relation to allergic rhinitis. Of them, 20 patients (37.7%) had allergic rhinitis.

1. Asthma + allergic rhinitis were often observed in patients between the ages of 0 and 39. In contrast, asthma alone in those over age 60. 2. A RAST score was positive in house dust mite (HDm)(50.9%), cockroach(24.5%), and *Candida* (26.4%) in these patients, and the positive rate was not different between patients with and without allergic rhinitis. 3. The frequency of positive RAST against Japanese cedar and rice plants was higher in patients with allergic rhinitis (42.9% and 18.5%) than in those without allergic rhinitis (28.6 and 3.7%), however, the each positive rate or RAST against the two allergens was not significantly different between those with AR and without AR. 4. The number of patients with AR induced by pollen alone (pollinosis) was not large (5/53, 9.4%) in the patients with asthma.

It was clarified from the results that allergic rhinitis was often observed in asthma patients, but not pollinosis. and that IgE antibodies against Japanese cedar and rice plants were found even in patients without AR.

Key words : bronchial asthma, allergic rhinitis, IgE antibodies, house dust mite, Japanese cedar

Introduction

It is well known that bronchial asthma is often combined with allergic rhinitis, and that the onset mechanism of asthma¹⁻³⁾ and allergic rhinitis^{4,5)} is involved in IgE-mediated allergic reactions, in which histamin, leu-

kotrienes and cytokines are released^{6,7)}. Immuno therapy with relevant allergen has been performed for patients with asthma and those with allergic rhinitis with clinical efficacy⁸⁻¹⁰⁾, inhibiting allergen-induced infiltration of CD4 + T lymphocytes and eosinophils local allergic sites¹¹⁾. Pollinosis, a

clinical type of allergic rhinitis, is also induced by tree and grass pollens through IgE-mediated allergic reactions^{5, 12)}

In this study, the presence of IgE antibodies against asthma-inducing allergens and allergic rhinitis (pollinosis)-inducing allergens was examined in asthma patients with and without allergic rhinitis, and the difference in the presence of these antibodies was compared between the two groups.

Subjects and Methods

The subjects in this study were 53 patients with asthma (28 females and 25 males, mean age 58.8 years). The mean level of serum IgE was 552 IU/ml (8–2564 IU/ml). Allergic rhinitis was clinically diagnosed by the presence of nasal symptoms such as rhinorrhea, nasal obstruction and sneeze. Pollinosis was also clinically evaluated by seasonal increase in nasal symptoms. Of these patients, 20 (37.7%) had allergic rhinitis (AR). IgE antibodies were measured by radio allergo sorbent test (RAST) for house dust mite (HDm), cockroach, and *Candida albicans* as asthma-inducing allergens, and by the CAP system for Japanese cedar and rice plants as AR (pollinosis)-inducing allergens^{13, 14)}

Serum IgE level was estimated by radio-immunosorbent test (RIST)

Statistically significant differences of the mean were evaluated using the unpaired Student's t test. a p value of <0.05 was regarded as significant.

Results

The frequency of positive RAST in all patients was 50.9% in house dust mite (HDm), 24.5% in cockroach, and 26.4% in *Candida albicans*. Table 1 shows clinical characteristic of asthma patients with and

without allergic rhinitis (AR). The mean age was lower in patients with AR than in those without AR. The level of serum IgE and frequency of positive RAST against HDm and *Candida* was higher in patients with AR than in those without AR, however, they were not significant. The number of asthma patients with AR was larger in those between the ages of 0 and 39. In contrast, the number of patients without AR was larger in those over age 60, as shown in Fig. 1.

Table 1. Characteristics of asthma patients with and without allergic rhinitis studied

Allergic rhinitis	No of subjects	Age (years)	Serum IgE (IU/ml)	RAST positive cases HDm	Candida
+	20	50.0	736 (22-2298)	60.0%	30.0%
-	33	64.1	444 (5-2564)	45.5%	24.2%

HDm;house dust mite

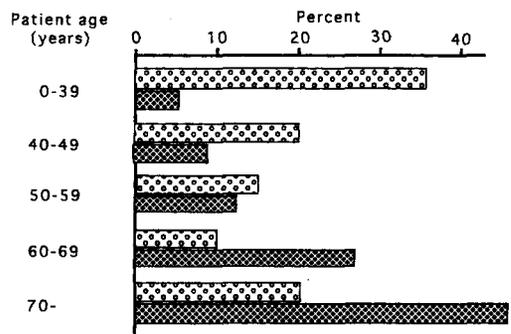


Fig. 1. Distribution of age in asthma patients with (◻) and without allergic rhinitis (◻)

IgE antibodies against asthma-inducing allergens (HDm, cockroach and *Candida*) and AR (pollinosis)-inducing allergens (Japanese

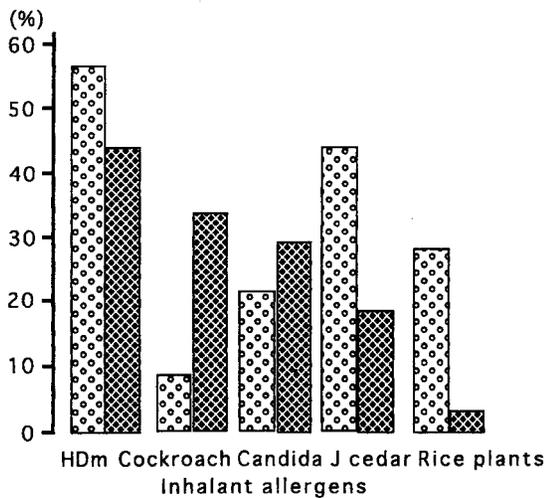


Fig. 2. IgE antibodies against inhalant allergens in asthma patients with (stippled) and without allergic rhinitis (cross-hatched)

cedar and rice plants) were compared between 14 asthma patients with AR and 27 without AR. Figure 2 shows comparison of positive RAST against each inhalant allergen between asthma patients with and without AR. The frequency of positive RAST against Japanese cedar and rice plants was higher in patients with AR than in those AR, however, the differences in the frequency between two groups were not significant. There were not significant differences in positive RAST against HDm, cockroach, and Candida, between patients with and without AR.

In patients without AR, the number of those with negative RAST against allergens examined was larger. The frequency of positive RAST against RA (pollinosis)-inducing allergens (Japanese cedar and/or rice plants) was lower (Fig. 3.)

In contrast, the frequency of positive RAST against asthma+AR-inducing allergens was higher in patients with AR (Fig. 4).

To clarify whether allergic rhinitis in patients with asthma is mainly induced by asthma-inducing allergens or AR (pollinosis)-inducing allergens, the presence of symptoms of pollinosis (seasonal increase of nasal symptoms) was examined in 11 patients with positive RAST against Japanese cedar. Of the 11 patients, 5 had not allergic rhinitis. Of the 6 patients with AR, 5 were patients with pollinosis, suggesting that the number of asthma patients with pollinosis was not large (5/53, 9.4%) (Table 2).

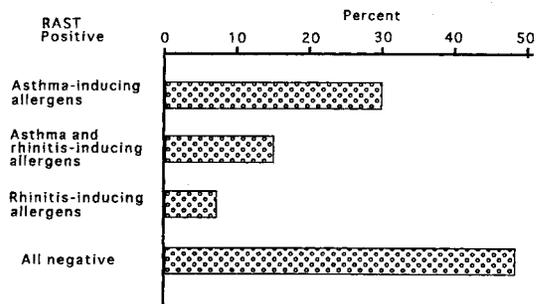


Fig. 3. Frequency of RAST positive subjects without allergic rhinitis. Asthma-induced allergens ; HDm, cockroach and Candida, rhinitis-induced allergen ; Japanese cedar and rice plants

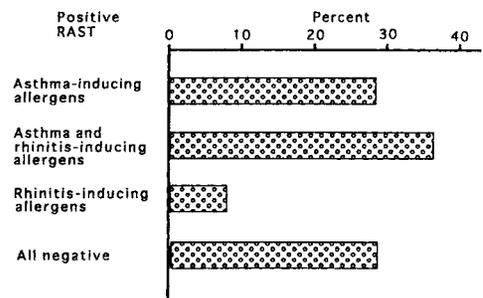


Fig. 4. Frequency of RAST positive subjects with allergic rhinitis. Asthma-inducing allergens ; HDm, cockroach and Candida, rhinitis-inducing allergens ; Japanese cedar and rice plants

Table 2. Asthma patients with positive RAST against Japanese cedar

Subjects	Serum IgE (IU/ml)	Japanese cedar	Rice plants	HDm	Candida	Pol
Allergic rhinitis (+)						
1. TH, 51y, F	1695	2+	6+	-	-	+
2. SS, 74y, M	690	3+	-	-	-	+
3. MY, 20y, M	313	3+	3+	3+	-	+
4. KU, 26y, F	1037	4+	-	5+	-	+
5. KA, 49y, F	577	3+	1+	4+	1+	-
6. KO, 49y, F	933	4+	4+	6+	-	+
Allergic rhinitis (-)						
1. KM, 49y, M	92	2+	-	-	-	-
2. MS, 60y, M	281	2+	-	-	-	-
3. IM, 60y, M	908	2+	-	4+	-	-
4. SM, 71y, F	523	3+	-	2+	-	-
5. KS, 48y, M	347	3+	-	3+	2+	-

Pol; pollinosis

Discussion

Bronchial asthma is often accompanied with other allergic diseases such as allergic rhinitis and atopic dermatitis. Asthma and allergic rhinitis have a common onset mechanism, in which IgE-mediated allergic reaction with CD 4 + lymphocytes and activated eosinophils^{11, 15-18)} is often found. Furthermore, dual allergic reaction, early and late, is sometimes observed both in bronchial and nasal allergen challenge^{19, 20)}.

In this study, the pathogenesis of allergic rhinitis combined with asthma was studied comparing IgE antibodies against inhalant allergens between patients with and without allergic rhinitis (AR). The frequency of asthma with AR was considerably high (37.3%), and often observed in patients between the ages of 0 and 39. The positive rate of RAST Score against asthma-inducing allergens (HDm, Cockroach and candida) was not significantly different between the patients with and without AR. In contrast, the rate of positive RAST against both asthma and pollinosis-inducing allergens was larger in

patients with AR compared to that in those without AR, suggesting that patients with AR are more frequently sensitized by inhalant allergens than those without AR.

Regarding the pathogenesis of AR, 9 of the 14 patients with AR (64.3%) had IgE antibodies against asthma-inducing allergens (mainly HDm), showing that AR in the patients might be induced by these allergens, but not by pollens. The RAST score against asthma-inducing allergens was all negative in other 4 of the 14 patients. Only residual 3 patients showed a positive RAST score against pollinosis-inducing allergens (Japanese cedar and rice pollens) alone. The results demonstrate that allergic rhinitis found in asthma patients is more closely related to asthma-inducing allergens than pollinosis-inducing allergens.

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気管支喘息におけるアレルギー性鼻炎と花粉抗原に対するIgE抗体

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気管支喘息53例を対象に, 吸入抗原に対するIgE抗体とアレルギー性鼻炎の合併の有無との関連について若干の検討を加えた。対象53例中20例(37.7%)にアレルギー性鼻炎の合併が見られた。

1. 喘息+アレルギー性鼻炎の合併は, 0-39才の年齢層で最も多い傾向であったが, 一方, 喘息単独は60才以上の症例に多く見られた。2. IgE

抗体の陽性率は, それぞれHDm50.9%, ごきぶり24.5%, カンジダ26.4%であった。これら抗原のRAST陽性率は, アレルギー性鼻炎合併例と非合併例の間に有意の差は見られなかった。3. スギおよびイネ科の花粉に対するRAST陽性率はアレルギー性鼻炎合併例で(スギ42.9%, イネ科18.5%), 非合併例に比べ(28.6%と3.7%)高い傾向が見られたが, 両群間に有意の差は見られなかった。4. 花粉抗原によるアレルギー性鼻炎(花粉症)の頻度は9.4%(53例中5例)とあまり高くはなかった。

以上の結果より, 気管支喘息患者でしばしばアレルギー性鼻炎の合併が見られること, (しかし, 花粉症は少ない), そして, スギおよびイネ科の花粉に対するIgE抗体は, アレルギー性鼻炎の合併のない症例においても観察されること, などが明らかにされた。