
◎原 著

Candida-specific IgG₄ antibodies and bronchial asthma

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Abstract : Serum levels of Candida-specific IgG₄ antibodies were examined in 66 patients with bronchial asthma, relating to patient age and asthma severity.

1. The levels of Candida-specific IgG₄ antibodies were the highest in patients with 60+ years of age, compared to the levels in cases with 0-39 and 40-59 years of age.

2. In cases with 40-59 years of age, the levels of Candida-specific IgG₄ were significantly higher in cases with long-term steroid therapy (severe intractable asthma) than in cases without steroid regimen.

The results suggest that increased levels of Candida-specific IgG₄ were observed in relation to patient age and asthma severity.

Key words : Candida, Specific IgG₄, Bronchial asthma, Aging,
Asthma severity

Introduction

Candida albicans is one of the most important allergens in bronchial asthma. *Candida* as an allergen can induce histamine release from basophilic leucocytes through IgE receptors^{1,2)}, but the release of histamine induced by *Candida* is somewhat different from the release by house dust-mite and anti-IgE^{3,4)}, suggesting participation of IgG antibodies in *Candida*-induced reaction^{2,5)}.

The role of IgG₄ antibodies, which are capable of sensitising human skin for 2-4 hours only⁶⁾ and described as IgG short-term sensitising (IgG S-TS) by Parish⁷⁾, is still controversial. It has been suggested

that IgG₄ as well as IgE may participate in immediate allergic reactions. However, any results about participation of IgG₄ in allergen-triggered histamine release and anti-IgG₄-induced release of histamine have not been shown^{8,9)}. On the other hand, it has been reported that IgG₄ could act as a blocking antibody in natural allergen exposures and hyposensitization treatment^{10,11)}. A question as to whether IgG₄ is a sensitising or a blocking antibody, or both still remain.

In this report serum levels of *Candida*-specific IgG₄ antibodies were measured in patients with bronchial asthma, and relationship of the levels to patient age and asthma

severity was discussed.

Subjects and Methods

Subjects were 66 patients with bronchial asthma, 35 females and 31 males, including 15 cases with steroid-dependent intractable asthma. The subjects were divided into three age groups; 0 to 39 (group A), 40 to 59 (group B), 60+ years of age (group C).

Serum levels of specific IgG₄ against *Candida albicans* were estimated by a ELISA method¹²⁾.

Results

1. Relationship to patient age.

A significant difference was not present in serum levels of *Candida*-specific IgG₄ between cases of group A and B. The levels of *Candida*-specific IgG₄ were significantly higher in cases of group C than in cases of group B ($p < 0.05$) (Table 1).

Table 1. Serum levels of *Candida*-specific IgG₄ antibodies in relation to patient age

Patient age, years,	No of cases	Serum levels of specific IgG ₄ (U/ml)	
		Mean \pm SD	Range
0-39	12	14.5 \pm 13.7	2.5-48.0
40-59	21	13.2 \pm 15.6	2.5-62.0
60+	33	25.9 \pm 24.2	2.5-80.0

2. Relationship to asthma severity.

Serum levels of *Candida*-specific IgG₄ were $11.9 \pm 14.3 \text{ U/ml}$ (Mean \pm SD) in cases without steroid regimen, and $21.0 \pm 2.0 \text{ U/ml}$ in cases with long-term steroid therapy (ST cases) (severe intractable asthma) of group A. The levels were higher in ST cases, although the difference was not significant. Compared to the levels of *Candida*-specific IgG₄ ($7.2 \pm 5.2 \text{ U/ml}$) in cases without steroid

regimen, the levels were significantly higher ($32.5 \pm 21.1 \text{ U/ml}$) in ST cases of group B ($p < 0.001$). No significant difference was present in *Candida*-specific IgG₄ between cases without steroid regimen ($24.5 \pm 23.4 \text{ U/ml}$) and ST cases ($29.4 \pm 26.0 \text{ U/ml}$) of group C (Fig. 1).

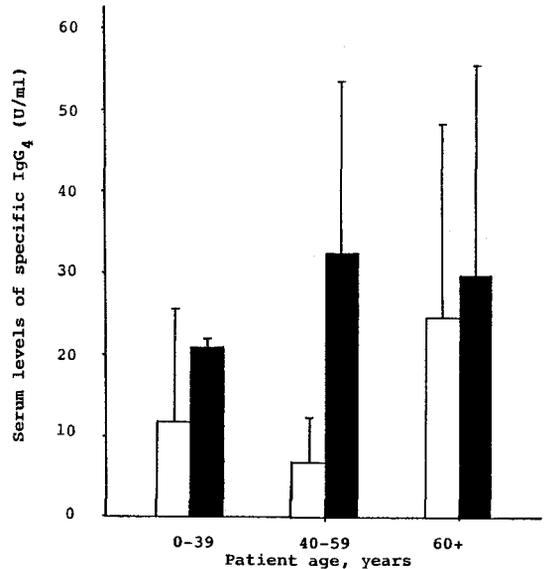


Fig. 1. Serum levels of *Candida*-specific IgG₄ antibodies in relation to asthma severity. (□) : cases without steroid regimen, (■) : cases with long-term steroid therapy

Discussion

It has been thought that IgG₄ participates in immediate allergic reactions. At first, it has been noticed that IgG₄ as well as IgE acts on allergic reactions as a sensitising antibody, as previously reported by Parish⁷⁾. IgE, however, can induce histamine release from basophils, but not IgG₄⁹⁾. After then IgG₄ has been demonstrated to act as a blocking antibody in natural allergen exposures and hyposensitization treatment^{10,11)}

In this report an increase in *Candida*-

specific IgG₄ was observed in relation to patient age and asthma severity. Our previous studies showed that serum levels of Candida-specific IgG in patients with bronchial asthma increased with aging¹³⁾. The levels of Candida-specific IgG₄ correlate to a certain extent with aging. The levels were higher in cases with 60+ years of age, compared to cases with 0-39 and 40-59. The results suggest that higher levels of specific IgG₄ do not lead to participation of Candida in the onset mechanisms of bronchial asthma in elderly.

On the other hand, it is possible to speculate that higher levels of Candida-specific IgG₄ in patients with severe intractable asthma correlate with participation of the allergen-mediated reactions in the onset mechanisms when patient age is between 40 and 59 years. In cases with 0-39 years of age, higher levels of specific IgG₄ were observed in severe intractable cases. But no significant difference was found because the number of these cases was too small, only two cases.

The results obtained here suggest that specific IgG₄ acts as a sensitising antibody when Candida is an allergen.

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カンジダ特異的IgG₄抗体と気管支喘息

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66例の気管支喘息症例を対象に, 血清中カンジダ特異的IgG₄抗体を測定し, その血中レベルと年齢および喘息の重症度との関連について検討を加えた。

1. 血清カンジダ特異的IgG₄値は, 0~39才, 40~59才の年齢層にくらべ, 60才以上の年齢層において高く, 年齢によりその値が変動することが

示唆された。

2. 40~59才の年齢層では, 血清カンジダ特異的IgG₄は, ステロイド非使用例にくらべ, ステロイド依存性重症難治性喘息症例で有意の高値を示し, この年齢層では, カンジダ特異的IgG₄抗体がその発症病態に関連している可能性が示唆された。

以上, カンジダ特異的IgG₄抗体の上昇は, 高年齢層の症例(60才以上)では全般的に, また40~59才の年齢層で重症型喘息症例において観察されることが明らかにされた。

キーワード: カンジダ, 特異的IgG₄, 気管支喘息, 加齢, 喘息重症度