

SPECIAL CONTRIBUTION 2

Significance of complications of allergic diseases in young patients with interstitial cystitis

TETSUO YAMADA

Department of Urology, National Sagamihara Hospital, Sagamihara city, Kanagawa, Japan

Abstract

Background: It was found that about one-half of interstitial cystitis (IC) patients have complications of allergic diseases. However, significance of the complications have not been studied.

Patients and Methods: Thirty-four patients (age range 20 to 39 years old) meeting the diagnostic criteria of NIDDK established in 1987 were selected. Clinical allergic tests and significance of complications of allergic diseases were examined.

Results: Eighty-six percent of young patients had complications of allergic diseases. In two patients, IC was a part of generalized allergic diseases. In 25 patients, IC was suggested to have some association with allergy. Of these 25 patients, there were alternating symptoms or proportionally changing symptoms of allergy and IC in 15 patients, and the number of eosinophils increased in six patients. Seven IC patients were considered to have developed allergic diseases only by chance without apparent association.

Conclusions: Complications of allergic diseases are frequent, particularly in young IC patients. The results suggest the involvement of allergy in about 80% of IC patients with complications of allergic diseases. In only 6% of patients, IC was a part of generalized allergic disease.

Key words allergic cystitis, allergic march, eosinophilic cystitis, interstitial cystitis.

Introduction

It is commonly thought that interstitial cystitis (IC) is associated with allergy on the basis of findings of increased numbers of infiltrating mast cells and eosinophils in the bladder wall,¹ effectiveness of antihistamine,² and antiallergic drugs.³ Moreover, it was found that about half of IC patients have complications of allergic diseases.⁴ It is suggested that allergic diseases may occur by chance in IC patients, but there is another opinion that IC is one of the symptoms of allergic diseases in patients exhibiting an increase in the number of infiltrating eosinophils in the bladder wall.^{1,5} In recent years, the number of patients complicated by allergic diseases has become more frequent due to environmental deterioration and the number of IC patients exhibiting complications of allergic diseases has also

increased. However, the actual conditions and significance of the complications have not been studied. In this study, we examined the allergic status of recent young IC patients, and reviewed the significance of complications of allergic diseases.

Patients

Thirty-four patients (aging from 20 to 39 years old) meeting the diagnostic criteria of National Institute of Diabetes, Digestive and Kidney Diseases (NIDDK) established in 1987 were selected as subjects. Fifty-two IC patients (50 to 69 years old) were used as controls. Table 1 shows details of the complicating allergic diseases.

Methods

Items studied were as follows: percentage of complications of allergic diseases among patients; type of symptoms (painful type or frequency and urgency type); skin

Correspondence: Tetsuo Yamada, Department of Urology, National Sagamihara Hospital, 18-1 Sakuradai, Sagamihara city, Kanagawa 228-0815, Japan.
Email: t-yamada@sagamihara-hosp.gr.jp

Table 1 Complication of allergic diseases

Age (number of patients)	Bronchial asthma	Pollen allergy	Skin sensitivity	Food allergy
20–39 years (34)	9 (26%)	25 (74%)	15 (44%)	3 (14%)
50–69 years (52)	4 (8%)	6 (12%)	4 (8%)	1 (2%)

test; total IgE radioimmunosorbent test (RIST); IgE radioallergosorbent test (RAST) score; and prognosis of the hydrodistension.

We examined the significance of complications and classified their occurrences as follows

- Allergy was the cause of the onset of IC which was one of the symptoms of generalized allergic diseases.
- Allergy and IC were considered to have some association between them.
- Allergic diseases occurred by chance, and they were not associated with IC.

With respect to (a) in the above, it is necessary to identify the causative allergen and the antibody inducing the allergic disease in the bladder wall to conclude that cystitis is a part of generalized allergic diseases, that is, an allergic cystitis.⁵ More specifically, it is necessary to reproduce the allergic reaction in the bladder by provocation tests.⁵

With respect to (b) in the above, findings suggesting the relevance of allergic diseases were as follows:

- Increase in the number of infiltrating eosinophils in the bladder wall.
- Association of the symptoms observed in the bladder and those in other organs with allergic reactions, that is, alternating symptoms or proportionally changing symptoms of IC and allergy.
- Complications of multiple allergic diseases.

With respect to (c) in the above, the patients with allergic diseases occurring by chance, that is, having no association.

Results

The clinical and allergic findings (Table 2) from the study are: 86% ($n = 29$) of young patients had complications of allergic diseases in contrast with 19% of aged patients. The average total IgE was 485 IU/mL (reference value: < 250 IU/mL). IgE RAST showed that 29 patients (85%) were positive for the antigen, and 25 patients (74%) were positive for multiple anti-

Table 2 Clinical and allergic findings

Age (number of patients)	20–39 years (34)	50–69 years (52)
Complication of allergic disease	86%	19%
Total IgE (IU/mL)	485	110
IgE RAST positive patients for antigens	29	14
Pain type	27%	83%
Efficacy of hydrodistension	33%	67%

gens. It also revealed that young patients have greater allergic predisposition than aged patients. Twenty-seven percent ($n = 9$) of young patients had pain as the main symptom, in contrast with 83% ($n = 43$) of aged patients. Hydrodistension was less effective in young patients (effective in 33%) than in aged patients (effective in 67%).

The significance of complications of allergic diseases are as follows. In two patients, IC was a part of generalized allergic diseases. In 25 patients, IC was suggested to have some association with allergy. Details were as follows: In 15 patients, there were alternating symptoms or proportionally changing symptoms of allergy and IC. The number of eosinophils increased in the six patients. The complications of multiple allergic diseases were found in 11 patients. However, seven IC patients were considered to have developed allergic diseases only by chance without apparent association between the two diseases.

Discussion

The results of this study showed that the percentage of young IC patients with complications of allergic diseases is higher than that in aged patients, and that young patients have greater allergic predisposition than aged patients because they showed increased IgE levels as determined by RIST and RAST. The increase in the number of young patients with IC who have complications of allergic diseases may be associated with environmental pollution. With respect to the finding that the number of patients of painful type is small in young

patients, it is necessary to conduct a follow-up study to determine whether this is because they are at a stage prior to the stage at which typical IC symptoms appear. In addition, the difference in the effects of hydrodistension treatment was speculated to be due to difference in the causes of diseases.

There are several opinions regarding the significance of the complications of allergic diseases in patients with IC. Some researchers reported that there is no association between allergic diseases and IC, and the complications of allergy occur only by chance.⁵ Some considered that the increased number of infiltrating eosinophils in the bladder wall is one of the indicators of allergic diseases.^{1,5} In this study, we classified the significance into three types. With respect to the first interpretation (a), it is necessary to identify causative allergens and antibodies of allergic diseases of the bladder wall before one can conclude that cystitis is a part of generalized allergic diseases.⁵ Messing *et al.*¹ stated that patients with allergy-specific changes in the bladder tissue, that is, those with infiltration of eosinophils, show some of the symptoms of basic diseases. However, they have not demonstrated allergic reactions between an allergen and its specific antibody in the bladder wall; therefore, their cases are considered to correspond to our interpretation (b).

With respect to the second interpretation (b), as findings suggesting the relevance of allergy in IC, we pointed out the three reasons. Of these, the association of the symptoms between the bladder and other organs is supported by findings, for example, that patients who suffered from pollen allergy, asthma, or atopic dermatitis before the development of IC showed improvement or change of allergic symptoms after development of IC. When symptoms in the bladder of these patients improved following treatments, sometimes their skin allergic symptoms deteriorated, or allergic symptoms in the upper respiratory tracts appeared. This is considered to be one of the allergic march characteristics of allergic diseases. Namely, the phenomenon is as follows:⁶ the organs such as the respiratory tract, nose, and skin of patients with hypersensitivity are closely connected to each other via the parasympathetic nerve, and when stress in one organ increases, that in other organs decreases relative to the former, resulting in improvement of symptoms in the other organs. From the clinical viewpoint, the bladder could also be involved in the

allergic march. As a factor that induces hypersensitivity in the bladder, a history of bacterial cystitis may be a candidate. Approximately 80% of patients with IC were found to have a history of bacterial cystitis, and this common cystitis may cause the allergic march, which includes the bladder. The major cause of hypersensitivity in the bladder wall is the increased number of mast cells in the bladder. The functions of these mast cells are differentiated due to the characteristics of the environment in the bladder, which is isolated from its outside environment, and the mast cells may become affected by neurotransmitters.⁷ The results of this study indicate the involvement of allergy in most of IC patients with complications of allergic diseases. Therefore, we suggest that consideration of such involvement of allergy is important in the treatment, as well as clarification of causes.

Conclusions

Complications of allergic diseases are frequent, particularly in young IC patients. Such complications are associated with about 80% of IC patients. Clarification of the association between allergic diseases and IC will be important in clarifying the causes of IC.

References

- 1 Messing EM. Interstitial cystitis. In: Walsh PC, Retz AB, Stamey TA, Vaughan ED, eds. *Campbell's Urology*, 6th edn. Philadelphia: W.B. Saunders, 1991; 985–6.
- 2 Simmons JL. An explanation for the beneficial effect of antihistamine. *J. Urol.* 1961; **85**: 149–55.
- 3 Bouchelouche K, Nordling J, Hald T, Bouchelouche P. The cysteinyl leukotriene D4 receptor antagonist Montelukast for the treatment of interstitial cystitis. *J. Urol.* 2001; **166**: 1734–7.
- 4 Kzoll JA, Clark DC, Gittes RF, Tan EM. The natural history of interstitial cystitis: A survey of 374 patients. *J. Urol.* 1993; **149**: 465–9.
- 5 Yamada T, Murayama T, Mita H, Akiyama K. Alternative occurrence of allergic disease and unusual form of interstitial cystitis. *Int. J. Urol.* 1998; **5**: 329–36.
- 6 Takino M. The importance of autonomic nervous in allergy. *Jpn J. Allergol.* 1979; **20**: 553–88. (In Japanese.)
- 7 Yamada T, Mita H. Subtypes of bladder mast cells in interstitial cystitis. *Int. J. Urol.* 2000; **7**: 292–7.