Total serum IgE levels in vitiligo with special consideration of atopy

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ABSTRACT

Background: Atopy is according to some authors frequently accompanying vitiligo. We investigated the problem in a series of patients.
Materials and Methods: 64 vitiligo patients and 58 controls of a similar age and sex distribution participated in the study. Detailed histories concerning the atopic diseases and total serum IgE levels were obtained. These findings were assessed considering also the type of vitiligo, the age of onset and familial characteristics of patients.
Results: No significant difference was found between the total serum of IgE levels of patients with vitiligo and the control group. The percentage of patients expressing the atopy was the same in both groups. There were also no significant differences between separate groups of vitiligo patients in either generalized, localized, acrofacial or segmental forms. Serum total IgE levels in patients who displayed atopic features were found to be significantly advanced when compared with the patients who did not have an atopic condition ($p<0.001$).
Conclusion: Our findings do not support the existence of an *atopic vitiligo* subgroup; however, atopy may accompany vitiligo just as it may accompany other diseases. If the atopic patients were excluded there was no significant difference in IgE serum levels between patients in the vitiligo and control group.

KEY WORDS

vitiligo, atopy, IgE, clinical study

Introduction

Vitiligo is an acquired skin disease characterized by white areas on the skin and can be seen in 1-2% of the general population. The disease may affect individuals of both sexes at any age and is mostly characterized by a loss of melanocytes. The etiology of vitiligo is still not clear and many authors believe that the condition is of an autoimmune origin as it often accompanies certain autoimmune disorders: thyroiditis, diabetes mellitus, pernicious anemia, alopecia areata (1-3).

Vitiligo can be accompanied by atopy and certain studies suggest that atopy may affect the prognosis of this disease (4,5). There are numerous publications that

Table 1. The mean IgE values (IU/ml) in the vitiligo group and control group.

Characteristic	Atopy	n	Mean	SD	Minimum	Maximum
Vitiligo Group	Absent	58	60.7	50.8	10.1	277
	Present	6	904.9	784.6	40.2	2000
	Total	64	139.9	335.7	10.1	2000
Control Group	Absent	52	76.6	55.5	4.4	278
	Present	6	182.5	127.7	21.6	331
	Total	58	87.5	72.4	4.4	331

SD = standard deviation

describe cases in which vitiligo and atopy appear together (6,7), and for this reason a sub-type of "*atopic vitiligo*" has been proposed (8). In the present study the simultaneous appearance of vitiligo and atopy and as well as subtypes of vitiligo were investigated.

Materials and methods

Vitiligo patients referred to our clinic between the years 2000-2001 were included in the study. Vitiligo was diagnosed by clinical examination and a Wood lamp. The age, sex, type of disease, the age of onset, total duration, atopic conditions (atopic dermatitis, allergic rhinitis, conjunctivitis, asthma) and family history of vitiligo were recorded. The total serum IgE levels were assessed. The patients referred to our outpatient clinic were included randomly in the study as controls, except for those with atopic conditions.

Patient and control groups were carefully interviewed in order to ensure that none of the patients was receiving a systemic treatment. *Microparticle Enzyme Immunoassay* was used for determination of the serum total IgE levels; the assay was carried out by a *IM-X* device obtained from *Abbott* and carried out under laboratory conditions. Normal values were accepted as 0-120 IU/ml.

For statistical analysis the SPSS for Windows 10.0 software package was used. The data were analyzed by χ^2 test, Fisher Exact test, Mann Whitney U test and one-way ANOVA; $p<0.05$ was considered significant. Descriptive statistics for numeric variables are reported as range and mean ± standard deviation.

Results

Sixty four vitiligo patients (27 males, 37 females) and 58 control cases (27 males, 31 females) were included in the study. There was no difference between sexes (x^2=0.24, p=0.92). The age of patients was 4-60 years (mean: 34.9±15.0) while the age of the controls was 6-60 years (mean: 32.6±13.1). They were statistically comparable (t=0.91, p=0.37). In 20 patients (31.3%) the lesions were generalized, in 25 (39.0%) they were localized, in 14 (21.9%) they were acrofacial and in 5 (7.8%) they were segmental. The age of onset of the disease ranged between 3-60 years (mean 30.4±15.6). In 19 patients (29.7%) vitiligo appeared early, prior to the age of 20 years (8), while in 45 (70.3%) the disease appeared later (late onset). The duration of the disease ranged between 1 month and 32 years (mean 4.4±5.7 years). In six cases (9.4%) a familial history was present.

The mean total serum IgE levels were 139.9±335.7 (10.1-2000) IU/ml in the vitiligo group and 87.5±72.4 (4.4-331) IU/ml in the control group (Table 1). No statistical difference was found between these levels (t=1.16, p=0.25). Six patients in each group mentioned atopic symptoms. In the vitiligo group allergic rhinitis was observed in 2 patients, asthma in 4 patients while in the control group atopic dermatitis was determined in 1 patient, allergic rhinitis in 3 patients and asthma in 2 patients. There was no difference between two groups regarding atopic symptoms (x^2=0.32, p=0.86) In patients with vitiligo and atopy the mean serum IgE levels (904.9±784.6 (40.2-2000) IU/ml) were significantly higher, if compared to the mean serum IgE levels (60.7±50.8 (10.1-277) IU/ml) found in purely vitiligo patients (t=8.63, p<0.001). The mean serum IgE levels of the vitiligo patients with atopic features (904.9±784.6 (40.2-2000) IU/ml) were higher compared to the mean serum IgE levels in the controls with atopic features (182.5±127.7 (21.6-331) IU/ml); but the difference was only marginally significant (t=2.23, p=0.0501).

No statistical difference was found between the serum total IgE levels when assessed according to vitiligo types (F=0.91, p=0.44). There was no statistical difference between the vitiligo group with familial history (74.9±27.6 IU/ml) and the group without a familial history (146.6±352.1 IU/ml) (t=0.5, p=0.62) or regarding the frequency of atopic disorders (x^2=0.67, p=0.54). Similarly, no significant difference was found regarding mean serum IgE levels (t=-0.09, p=0.92) or frequency of atopic disorders (x^2=1.2, p=0.35) in patients with an

early onset of vitiligo (133.9±276.8 IU/ml) and in patients with a delayed onset of vitiligo (142.4±360.5 IU/ml).

Discussion

The relationship between vitiligo and atopy was first mentioned by Perfetti et al. (8) and a higher ratio of atopy (22%) was reported in the vitiligo group in comparison to the normal population. Additionally, it was found that familial history and generalized lesions were seen more frequently in vitiligo patients with atopy and that the disease had an earlier onset and faster progression. These findings led to the observation of a different clinical course that can be named "*atopic-vitiligo*". A similar study by Chatain et al. (9) reported no difference in either the course of vitiligo, the clinical types of the disease or any other characteristics between pure vitiligo and atopic vitiligo patients. When compared with the vitiligo group without AC, higher serum IgE levels were reported in the atopic-vitiligo group, but these were lower compared to atopic individuals without vitiligo.

Our findings do not support the concept of "*atopic-vitiligo*" as reported by Perfetti et al. (8). More over, the results obtained in our study comply with the results obtained by Chatain et al. (9). The only difference in our study is that no difference of serum IgE levels was detected between vitiligo patients with atopic features and atopic patients without vitiligo.

It was found that in vitiligo T-helpers decreased at the pathological level and therefore the accompanied $T_{Helper}/T_{Suppressor}$ (T_H/T_S) ratio decreased as well, and on the other hand an increase was determined in the activity of natural killer cells (10,11). In atopic patients, T_S cells are decreased and on the contrary an increase was observed in T_{H2} cells that accelerates IgE synthesis by means of IL-4 release. It is assumed that the ratio of IL-4 to the level of IF-γ that displays an opposite effect to IL-4, can be considered a factor in the production of IgE (12,13). On the other hand, the activity of natural killer cells was found to have decreased in atopic patients in contrast to the same condition as seen in the vitiligo group (14).

As observed, changes in T cells and natural killer cells are not identical in both diseases. Based on this fact, a negative impact of atopy on the course of vitiligo may not be expected. Nevertheless the implication of atopy on the subtypes of T cells and on other cells which play an important role in the pathogenesis of both diseases should be considered in further studies. We can assume that comparison of the T cell profiles in vitiligo patients with or without atopy with other atopic cases may open new horizons in the pathogenesis of both diseases.

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