

Association Between Allergic Conditions and Celiac Disease in Pediatric Patients

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Dear Editor,

The connection between allergy and autoimmunity has been explored in different autoimmune conditions apart from celiac disease (CD). Epidemiological data on the prevalence of allergy in autoimmune diseases such as type 1 diabetes mellitus (T1D), multiple sclerosis (MS), and rheumatoid arthritis (RA) have raised the question of whether an allergic immune response mediated by Th2-type cytokines may suppress the Th1-mediated autoimmune disease or on the contrary, the Th1-type disease ameliorates allergy.¹ In these 3 Th1-mediated autoimmune conditions (T1D, MS, and RA) either an inverse association or non-significant differences between allergic diseases and autoimmunity have been reported.¹ In a similar way, the data available on the association between CD and allergy are limited with conflicting results.^{2,3} Accordingly, an association between allergic conditions and CD has been investigated in order to know whether CD is a predisposing factor to developing Th2-mediated allergic diseases. For this, a cohort of 41 patients suffering from CD and with the co-occurrence of allergy was included in the study. The patients were screened for the presence of an allergy, and only those patients with a history of allergic symptoms and sensitization to allergens documented by positive skin prick-tests (SPTs) and/or positive specific-IgE (sIgE) antibodies at the Allergy Unit were included. The retrospective study based on the history of patients' records was made in accordance with the ethical standards of the institutional and/or national research committee, the 1964 Declaration of Helsinki, and its later amendments or comparable ethical standards.

The age at the first onset of allergic symptoms in the group of celiac patients with allergy (n = 41) was of

6.45 ± 3.61 years (mean ± SD), whereas the age at diagnosis of CD was of 7.24 ± 6.71 years (mean ± SD). Thus, in 31 out of 41 patients (75.60%), the allergic symptoms were present before the diagnosis of CD. Within this group of patients with allergic symptoms before CD diagnosis, the mean age at the first onset of atopic dermatitis was of 3.95 ± 2.86 years, rhinoconjunctivitis of 7.17 ± 3.12 years, and asthma of 8.05 ± 3.92 years. To determine the association between CD and allergy, a case-control study was carried out using as controls Spanish allergic patients from the Alergológica 2015 survey (n = 481),⁴ matched by age with our group of patients with CD. A comparison between allergic patients with CD and age-matched allergic patients from the Alergológica 2015⁴ study was made with χ^2 test and Yates' correction. The associations between cases and controls were determined by the odds ratios (ORs) with the 95% CIs in a univariate regression analysis. All the statistical determinations were analyzed using Statistical Package for the Social Sciences version 18.0 (SPSS Inc., Chicago, IL, USA). The differences were considered statistically significant at P-values of less than .05.

Alergológica 2015⁴ study is based on pediatric population (≤ 14 years) from more than 200 schools throughout Spain with a mean age of 7.6 ± 4.4 years (n = 481). When comparing both groups of patients no differences were found in the presence of rhinoconjunctivitis, food allergy, drugs, and urticaria (Figure 1). However, atopic dermatitis presented a higher prevalence in patients with CD regarding pediatric patients from the Alergológica 2015 study (46.34% vs 12.1%, $P_c < .0001$) (Figure 1). The association between the prevalence of both groups provides a positive link in age-matched allergic children (OR = 6.299, 95% CI 3.215-12.338, $P_c < .0001$). Also, patients with CD had greater prevalence of asthma than allergic controls

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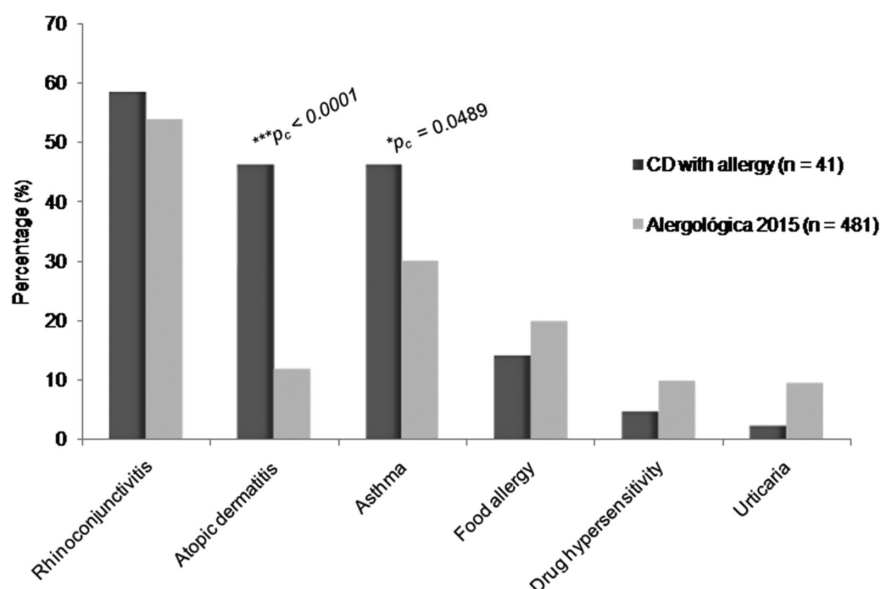


Figure 1. Comparison between the percentage of allergic diseases found in patients with celiac disease (n = 41) with Spanish pediatric patients (age ≤ 14 years) from the Alergológica 2015 study. P_c, P value corrected with Yates' correction; ***P < .0001; *P < .05.

(P_c = .0489) (Figure 1) as well as a raised risk for developing asthma (OR = 1.982, 95% CI 1.041-3.737; P_c = .037).

This study provides striking results not described until now because atopic dermatitis as well as asthma were more frequent and had equally an increased risk in the group of patients with CD. Therefore, there is a positive association between the presence of CD and the development of atopic dermatitis and asthma that could be explained by the existence of a common genetic background.⁵ Specifically, several case-control studies have shown the co-occurrence of atopic dermatitis with different autoimmune diseases in addition to CD, such as vitiligo, T1D, or RA, among others.⁶ Also, based on the genome-wide association studies (GWAS), the presence of non-HLA loci shared between CD and atopic dermatitis has been described.⁵ Similarly, there are common non-HLA genes to CD and other allergic conditions discovered by GWAS⁵ as well as HLA-DQ genes, suggesting shared disease mechanisms.

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