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LETTER TO THE EDITOR

Dear Editor

The Relationship between Total Serum IgE Levels and Atopic Sensitization in Subjects with or without Atopic Dermatitis

Atopic dermatitis (AD) is a complex allergic condition frequently accompanied by high IgE levels,[1-3] and IgE-mediated mechanisms are thought to play an important role in the pathogenesis of the IgE-related form of that disease.[1,3-5]

Studies on the relationships between allergic sensitization as measured by specific serum IgE or skin prick testing, total serum IgE levels and their determinants indicate that although total IgE values are affected not only by specific IgE they seem to correlate.[6] Then, the question arises if total serum IgE could be a good and relatively inexpensive proxy of atopic sensitization.

We decided to check what is the relationship between total and specific IgE and if the former could be a proxy for the latter. These we analyzed in the cohorts of adult AD patients (n = 143) and healthy controls (n = 71) studied by us previously for different purposes.[7] Thirty-nine (27.3%) AD patients were diagnosed with concomitant asthma, 76 (53.1%) with allergic rhinitis, 51 (35.7%) with allergic conjunctivitis and 54 (37.8%) with food allergy, while subjects representing healthy control group had no history of any allergic disorders.[7] The presence of allergic sensitization had been defined by the detection of specific IgE (>0.35 kU/L) to at least one of the following allergens: house dust mite, timothy grass, cat dander and *Cladosporium*.[7]

In AD patients, there was a strong correlation between total serum IgE levels and the positivity for atopic sensitization (R = 0.54, P < 0.0001; Spearman's rank correlation coefficient). Subsequently, receiver operating characteristic (ROC) curve was constructed, which demonstrated a good potential of total serum IgE to differentiate between the presence and the absence of atopic sensitization in AD patients [Figure 1A; AUC (95% confidence interval - CI): 0.85 (0.79-0.91), P < 0.0001]. The best accuracy with a moderate sensitivity of 72.4% (62.8-80.7, 95% CI) and a very high specificity of 97.4 (86.2-99.9, 95% CI) was obtained for total serum IgE cut-off value of >88.0 IU/ml (Fig.1B). The absence or the presence of AD-

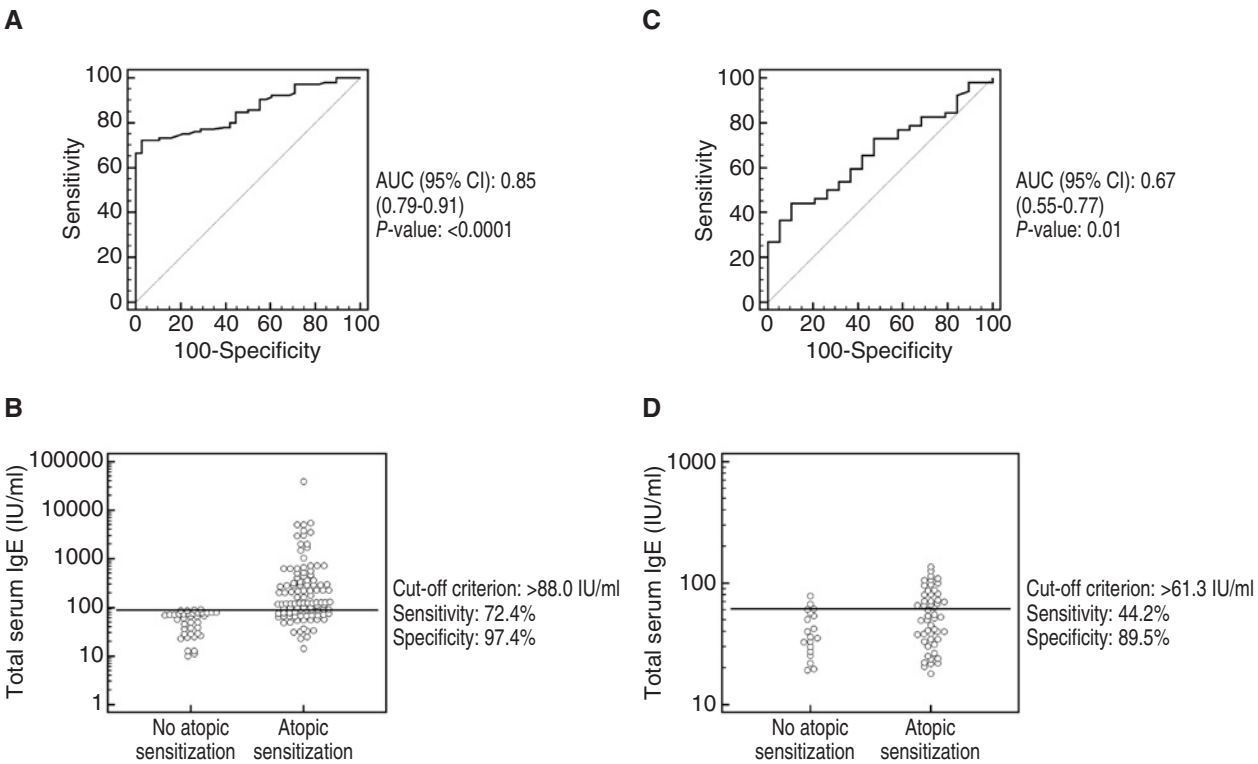

Fig. 1 Receiver operating characteristic (ROC) curve illustrating the potential of total serum IgE levels to differentiate between the presence and the absence of atopic sensitization in atopic dermatitis patients (**A**) or healthy controls (**C**), and the distribution of total serum IgE levels in respective groups of atopic dermatitis patients (**B**) or healthy controls (**D**) with regard to their cut-off value obtained by ROC analysis. AUC, area under the curve; CI, confidence interval.

accompanying allergic disorders, such as asthma (Supplementary Fig. 1), allergic rhinitis (Supplementary Fig. 2), allergic conjunctivitis (Supplementary Fig. 3) or food allergy (Supplementary Fig. 4), had no major effect on total serum IgE predictive value for atopic sensitization status. The correlations between total serum IgE concentrations and allergic sensitization positivity were a little bit more pronounced in AD subjects without accompanying allergic rhinitis, allergic conjunctivitis or food allergy when compared to the remainders (Supplementary Table 1).

Also in controls, total serum IgE levels correlated with the presence of atopic sensitization ($R = 0.26$, $P = 0.03$; Spearman's rank correlation coefficient), although much weaker than in AD patients. Likewise, ROC curve analysis conducted in healthy controls showed substantially smaller abilities of total serum IgE to predict the presence of atopic sensitization [Fig. 1C; AUC (95% CI): 0.67 (0.55-0.77), $P = 0.01$] when compared to those observed in AD patients. Although the corresponding overall best accuracy observed in healthy controls for total serum IgE cut-off value of >61.3 IU/ml was much poorer in than in AD patients, a low sensitivity of 44.2% (30.5-58.7, 95% CI) was in controls accompanied by a relatively good specificity of 89.5 (66.9-98.7, 95% CI; Fig. 1D).

In summary, in spite of the fact that total IgE values are determined not only by specific IgE,[1,8,9] there is a clinical relationship between total serum IgE levels and atopic sensitization status, which is strong in AD patients and much weaker in healthy subjects. Adult AD patient with high total serum IgE (>88.0 IU/ml) will most probably have atopic sensitization (IgE-related AD) but lower IgE levels will not necessarily mean its absence. Our results obtained in adult AD patients seem to be in line with those obtained in children.[10] In controls, total serum IgE levels are apparently capable of identifying subjects with atopic sensitization but their abilities to exclude the presence of atopic sensitization are even smaller than those observed in AD patients.

SUPPLEMENTARY MATERIALS

Supplementary Table 1 and Supplementary Figure 1–4 are available online.

Daniel P Potaczek[1,2], Magdalena Nastałek[3], Anna Wojas-Pelc[3] and Anetta Undas[2,4]
[1]Institute of Laboratory Medicine, Philipps-Universität Marburg, Marburg, Germany, [2]John Paul II Hospital, [3]Department of Dermatology and [4]Institute of Cardiology, Jagiellonian University Medical College, Krakow, Poland
Email: potaczek@staff.uni–marburg.de
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