

Serum Resistin in Patients With Allergic Contact Dermatitis

To the Editor:

Resistin belongs to the family of molecules known as “found in inflammatory zone” (FIZZ). The FIZZ family is known to be involved in the regulation of inflammation.¹ Previously, it has been reported that serum resistin levels are related to symptom severity in patients with allergic rhinitis.² Allergic contact dermatitis (ACD) is also characterized by T cell–mediated inflammatory reactions that occur after contact with sensitizing substances. The aim of this study was to evaluate resistin serum levels in patients with ACD.

This study included 49 patients (20 males and 29 females; median age, 45 years; range, 22–61 years; median body mass index or BMI, 24.02 kg/m²) with ACD and 23 healthy subjects (11 males and 12 females; median age, 36 years; median BMI, 24.01 kg/m²). Patients were recruited between February and July 2011 at the Department of Dermatology, Fondazione IRCCS Policlinico San Matteo, Pavia. Control subjects were healthy and did not have any disease concerning inflammatory/autoimmune disorders and were symptom free (and consequently not undergoing drug treatments). They were referred to the Dermatology Clinic of Pavia for pigmented lesion assessment and monitoring, so they were without any other significant skin disease. Inclusion criteria included ACD diagnosis, whereas exclusion criteria were as follows: (1) presence of secondary infections, (2) comorbidity with disorders that could affect the findings, and (3) use of interfering drugs, such as steroids or immunosuppressive agents.

Allergic contact dermatitis was diagnosed by using patch testing, performed according to the recommendations of the Italian Society of Allergological Dermatology.³ Briefly, patch tests were performed using the Italian standard panel proposed by SIDAPA (Società Italiana di Dermatologia Allergologica, Professionale e Ambientale) series, with 42 allergens, applying Haye Test Chamber (F.I.R.M.A. Spa, Rome, Italy) made of

an acrylic hypoallergenic adhesive sticking plaster, binding squared polypropylene chambers filled with square filter papers. Test sites were read 2 days (D2) and 3 days (D3) after patch application.

Clinical severity was evaluated, considering symptom score (0, absent; 1, mild; 2, moderate; 3, severe), itching score (0, absent; 1, mild; 2, moderate; 3, severe), and extent of skin lesion score (0, <10%; 1, 10%–20%; 2, 20%–30%; 3, 30%–40%). The ethics committee of the participating institutes approved the study, and patients gave written informed consent.

The Human Resistin Immunoassay (R&D Systems, Milan, Italy) was performed according to the manufacturer's instructions. Results were expressed as nanograms per milliliter. Descriptive statistics were first performed, and quantitative parameters were reported as medians and first to third quartiles (interquartile range, or IQR). The Wilcoxon test, Kruskal-Wallis test, and Spearman test were used for the analyses.

Allergic contact dermatitis sites included total body (19%), face (9%), hands (30%), arms (23%), trunk (15%), legs (12%), and feet (15%). The mean number of positive patches was 2.3. The most relevant allergen was nickel: 53% of patients were positive. The comparison between patients with ACD and healthy subjects showed a significant ($P = 0.0475$) difference in median serum resistin levels [patients: median (IQR), 12.65 (9.8–17.1) ng/mL; controls: median (IQR), 9.7 (8.9–13.4) ng/mL] (Fig. 1A). There was no relationship between serum resistin levels and BMI in healthy subjects ($P = 0.324$, $\rho = 0.255$) or patients ($P = 0.3242$, $\rho = 0.172$). There was a significant correlation between resistin levels and symptom score ($P = 0.05$, $\rho = 0.278$), resistin and itching ($P = 0.0077$, $\rho = 0.411$), and resistin levels and extent of disease ($P = 0.0139$, $\rho = 0.410$; Fig. 1B).

In addition, subjects were subdivided according to the intensity of response to patch testing for nickel and site of dermatitis: 17 had equal to or greater than +++ grade (9 patients with dermatitis over the entire body and 8 patients with dermatitis on the hands), and the remaining 32 patients had a lower grade. Serum resistin levels were significantly ($P = 0.0158$) higher in patients with more intense patch test response [median (IQR), 13.7 (10.6–18.5) ng/mL] than in patients with milder response [median (IQR), 10.6 (8.2–12.8) ng/mL]. The analysis of variance (Kruskal-Wallis test) for serum resistin levels was significant ($P = 0.05$): in particular, there was a significant difference in resistin levels between healthy controls and patients positive for nickel and between patients positive or not positive for nickel, as shown in Figure 2.

Although its expression was initially defined in adipocytes, significant levels of resistin expression in humans are mainly

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The authors declare no conflicts of interest.

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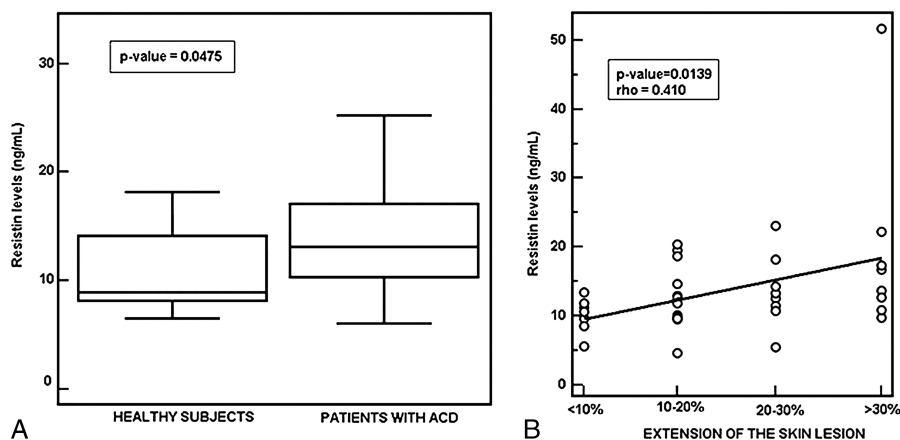


FIGURE 1. A, Resistin (in nanograms per milliliter) distribution in healthy subjects and in patients with ACD. Values are represented as medians (black line), quartiles (25th and 75th percentiles, white box), and *P* value between groups. B, Correlation, expressed with the Spearman correlation coefficient (ρ) and *P* value, between serum resistin and extent of the skin lesion score in patients with ACD.

found in mononuclear leukocytes, macrophages, spleen, and bone marrow cells.⁴ Increasing evidence indicates that resistin plays important regulatory roles in a variety of biological processes: atherosclerosis and cardiovascular disease, nonalcoholic fatty liver disease, autoimmune disease, malignancy, asthma, inflammatory bowel disease, and chronic kidney disease. Evidence suggests that resistin is involved in pathologic processes including inflammation, endothelial dysfunction,

thrombosis, angiogenesis, and smooth muscle cell dysfunction. The modes of action and signaling pathways whereby resistin interacts with its target cells are beginning to be understood.⁴ However, at present, mechanisms that may lead to elevation of resistin levels in patients with ACD have not been identified.

On the other hand, we did not measure the levels of other markers of inflammation (eg, ESR and CRP). We acknowledge the possibility that the elevated resistin in severe ACD may be a nonspecific finding related to the presence of inflammation (like other inflammatory markers such as the ESR or CRP) rather than being specifically related to the etiology or pathogenesis of ACD.

This preliminary study provides the first evidence that serum resistin may be increased in patients with ACD. The clinical relevance of the study is highlighted by the significant relationship between serum resistin levels and symptom severity, itching intensity, and lesion extent. In fact, ACD severity is associated with high resistin serum levels. In addition, because there was no relationship with BMI, it seems conceivable that resistin levels may express inflammation intensity and might play a pathogenic role in ACD. However, further studies should be conducted to confirm these preliminary findings. In conclusion, serum resistin is increased in ACD and is related to clinical severity.

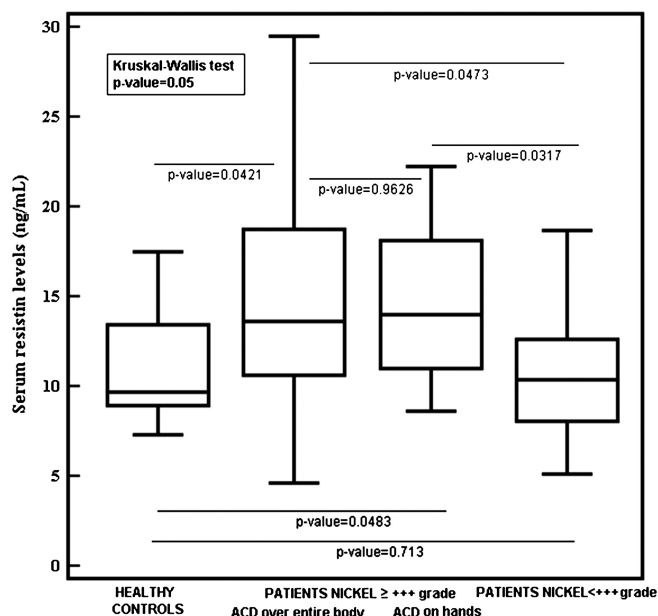


FIGURE 2. Resistin (in nanograms per milliliter) distribution in healthy subjects and in patients with grade of nickel less than +++ or equal to or greater than +++ evaluating the site of disease separately. Values are represented as medians (black line), quartiles (25th and 75th percentiles, white box), and *P* value between groups.

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