

Association between Obesity and Atopy in Adults?

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Dear Sir,

There is an ongoing controversial debate on a potential association between obesity (BMI ≥ 30) and atopic sensitization as well as a possible sex difference in this association in children and adults [1–3]. Recently, Chen et al. [1] demonstrated in a study of 1,997 adults that the prevalence of atopy is significantly associated with obesity but restricted to women. They assessed atopic sensitization by a positive skin prick test (SPT) result. However, in other big studies no relationship was found, e.g. in the European Community Respiratory Health Survey (ECRHS) of 13,909 young adults which used specific IgE measured by RAST as indicator of atopic sensitization [3].

Since assessment of atopic sensitization by SPT and RAST reflects different features of atopic sensitization, we analyzed the association between atopic sensitization and BMI using data from the German ECRHS I study [4]. In brief, 2,533 adults aged 19–65 years participated between 1990 and 1992 in this cross-sectional study which was conducted in Erfurt and Hamburg, Germany. Here, data from the age range of 45–65 years were included. Atopic sensitization was assessed by skin prick testing similar to the methods of the study of Chen et al. [1] including the following

four allergens: *Dermatophagoides pteronyssinus*, *Alternaria*, Fel d and birch. If the subjects had an averaged wheal size which was 3 mm or greater based on one of the allergens, they were considered atopic. In addition, specific IgE in the blood was also considered as an indicator of atopy and was measured using the Pharmacia CAP System. Thereby, atopic sensitization was defined if the concentration of at least one allergen-specific IgE was 0.35 kU/l or greater. Our investigation comprises the most common allergens: *D. pteronyssinus*, *Cladosporium*, Fel d, timothy grass and birch. Study participants were classified into 3 BMI categories (<25.0 , 25.0 – 29.9 , ≥ 30) and 3 age groups (19–39, 40–59, ≥ 60 years). Furthermore, data on current smoking, former smoking and nonsmoking status were used for adjustment. The final analysis is based on data from 1,840 individuals who had valid data of BMI, SPT, specific IgE and confounders (table 1). We adjusted for sex, age, smoking status and study center similar to the statistical analysis of Chen et al. [1].

No odds ratio for the BMI categories and atopic sensitization either assessed by SPT or by RAST was statistically significant. Also stratified analyses for sex did not yield statistically significant results.

Thereby, adjusted and unadjusted estimates did not differ substantially in these analyses (table 2).

The reasons for the different results remain obscure. Also the speculative attempt to explain the positive association with SPT [1] but not with RAST positivity [3] with a stronger histamine release in fatter skin folds during skin prick testing was not confirmed by our study. We might speculate on regional differences for the association between BMI and atopic sensitization, but no reasons would justify such a speculation. The most plausible explanation for the results of Chen et al. [1] is related to a potential chance finding, although statistically significant. This evaluation is supported by our study and even more importantly by the ECRHS study of almost 14,000 adults, which did not find an association [3].

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Table 1. Prevalence of atopic sensitization associated with BMI in men and women

	Men			Women		
	subjects	subjects with atopy		subjects	subjects with atopy	
	n	n	%	n	n	%
<i>SPT</i>						
BMI						
<25.0	581	147	25.30	549	107	19.49
25.0–29.9	392	71	18.11	163	29	17.79
≥30.0	86	17	19.77	69	13	18.84
<i>Specific IgE</i>						
BMI						
<25.0	581	188	32.36	549	171	31.15
25.0–29.9	392	121	30.87	163	42	25.77
≥30.0	86	28	32.56	69	18	26.09

Table 2. Adjusted odds ratios (OR) and 95% confidence intervals (CI) for atopic sensitization in relation to BMI

	Men		Women		Total	
	OR	95% CI	OR	95% CI	OR	95% CI
<i>SPT</i>						
BMI						
<25.0	1.00		1.00		1.00	
25.0–29.9	0.76	0.55, 1.06	1.04	0.64, 1.67	0.85	0.65, 1.11
≥30.0	0.95	0.53, 1.70	1.14	0.59, 2.20	1.03	0.66, 1.59
<i>Specific IgE</i>						
BMI						
<25.0	1.00		1.00		1.00	
25.0–29.9	1.08	0.81, 1.44	0.84	0.55, 1.27	0.97	0.76, 1.22
≥30.0	1.28	0.77, 2.12	0.81	0.45, 1.45	1.03	0.70, 1.50

Odds ratios were adjusted for sex, age, smoking status and study center.

References

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