

Lack of Evidence for Negative Correlation between Allergy and Obesity

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ABSTRACT

Experimental observations suggest a possible negative association between obesity and allergy. Three samples of subjects (a total of 481 individuals) in which both allergic manifestations and body mass index (BMI) have been registered were examined. Informed written consent was obtained by these subjects to participate to the study that was approved by the Council of Department. No negative association has been observed between allergy and BMI. On the contrary, a slight statistically not significant positive association was observed. The lack of a negative association between obesity and allergy in three independent samples of subjects makes it unlikely the possibility of a mere chance sampling artifact. Therefore, our observation does not support the hypothesis of a straightforward negative relationship between the two parameters.

Key words: Allergy, obesity, correlation

INTRODUCTION

The experimental observation by Wu *et al.*^[1] that eosinophils forestall obesity prompted us to search for a possible negative association between obesity and allergy.

Helminth-induced adipose tissue eosinophilia enhances glucose tolerance through cytokine interleukin 4 with alternatively activated macrophages necessary to maintain glucose homeostasis: Animals lacking eosinophils became obese and glucose resistant.^[1,2] These experimental studies prompted us to search for a possible negative correlation between allergy and obesity.

MATERIALS AND METHODS

We searched in our database samples of subjects in which information on both body mass index (BMI) and allergic manifestations had been registered and found a sample of 137 healthy workers of our university

(56 males with mean age of 42.2 years and 81 females with mean age of 35.7 years), a sample of 209 women undergoing surgical intervention for leiomyomas (mean age 43.0 years) and 135 women undergoing surgical intervention for endometriosis (mean age 34.7 years). Clinical manifestations consisted of asthma, rhinitis, and conjunctivitis. Allergy was confirmed by at least one positive prick test. These subjects have been considered in previous papers.^[3-5] Written informed consent was obtained from these subjects to participate to our studies that were approved by the Council of Department. Three-way contingency analysis was performed by a log-linear model according to Sokal and Rohlf.^[6] Chi-square test of independence was carried out by SPSS package.^[7]

RESULTS

The results are shown in Table 1, no negative correlation is present between BMI and allergic manifestations. On the contrary, a weak positive statistically not significant correlation is observed. Overall in subjects with BMI ≤ 25 ,

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Table 1: Percent proportion of subjects with allergic manifestations in relation to body mass index

Samples	BMI			Chi-square test of independence		
	≤25	>25≤30	>30	X ²	df	p
Healthy subjects						
% allergic	39.4	33.3	45.5	0.560	2	0.756
Total n°	99	27	11			
Women with leiomyomas						
% allergic	31.3	40.0	42.9	2.081	2	0.353
Total n°	96	85	28			
Women with endometriosis						
% allergic	45.5	46.9	50.0	0.031	2	0.985
Total n°	101	32	2			
Three-way contingency table analysis by a log-linear model X=BMI, y=Allergy, z=Sample						
	G	df	p			
xyz interaction	1.463	4	0.700			
xy independence	2.681	6	0.870			

BMI: Body mass index

the proportion of allergic subjects is 38.8%: In subjects with a BMI >25 and ≤ 30, the proportion of allergic subjects is 40.3%, and in those with a BMI > 30, the proportion is 43.9%. The lack of interaction in the log-linear analysis indicates that the relationship between allergy and obesity does not depend on the sample and that there is no correlation between the two parameters.

DISCUSSION

Our data do not show a negative association between allergy and obesity: The results are concordant in three independent samples making unlikely the possibility of mere chance artifact.

Although the increase of eosinophils in allergic subjects is well known, it should be noted that in our samples the determination of eosinophils was not reported.

AUTHOR'S CONTRIBUTION

Gloria-Bottini and Bottini have conceived the study, participated in its design, and coordinated and helped to draft the manuscript. Neri and Magrini have collected samples and carried out laboratory analyses. Bottini and Gloria-Bottini have analyzed the samples and performed the statistical analyses. All authors have drafted and revised critically the manuscript. All authors have approved the final revision and the submission of the paper.

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