Effect of body mass index on lung function in children

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Asthma and obesity are important health issues in industrialized countries and obesity is a risk factor for asthma. Our study was aimed at investigating the effect of body mass index (BMI) on lung function in a large sample of healthy children enrolled in two cross-sectional surveys performed on random samples of children, aged 10-17 years, living in the city of Palermo, Southern Italy. At school, all the subjects completed self-administered questionnaires regarding past and current respiratory symptoms and personal information, and performed spirometry. On a total of 3,200 children, 807 reporting wheeze ever, nocturnal cough, or exercise-induced cough were excluded from the analysis. 2,393 subjects (49% M) were evaluated. Height-adjusted lung function measures were plotted against BMI Z-score for each gender and age class, and slope values were computed by linear regression analysis. Height-adjusted FVC and FEV1 were positively correlated to BMI Z-score in both males and females. Slope values (L/BMI Z-score unit) were 0.057 in males and 0.114 in females for FVC and 0.022 and 0.072 for FEV1 respectively, being significantly steeper among females in each age class. FEV1/FVC ratio was inversely correlated to BMI Z-score with similar slope values for male and females. FEF25-75%/FVC ratio was negatively correlated to BMI Z-score: the slope values were steeper among females in each age group. In conclusion, despite both FVC and FEV1 are positively correlated to BMI, their disproportionate increase as BMI increases could cause a reduction of relative airway size as measured by the FEF25-75%/FVC at higher BMI values. This could, at least in part, contribute to the reported association between overweight-obesity and asthma.