Overweight, Obesity and Incident Asthma: A Meta-analysis of Prospective Epidemiologic Studies

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Rationale: Although obesity has been implicated as an asthma risk factor, there is heterogeneity in the published literature regarding its role in asthma incidence, particularly in men. Objectives: To quantify the relationship between categories of body mass index (BMI) and incident asthma in adults and to evaluate the impact of gender on this relationship. Methods: Online bibliographic databases were searched for prospective studies evaluating BMI and incident asthma in adults. Independent observers extracted data regarding annualized asthma incidence from studies meeting predetermined criteria, within defined categories of normal weight (BMI<25), overweight (BMI 25-29.9) and obesity (BMI≥30). Data were analyzed by inverse-variance-weighted random-effects meta-analysis. Stratified analysis between BMI categories and within gender was performed. Results: Seven studies (subject n=333,102) met inclusion criteria. Compared with normal weight, overweight and obesity (BMI≥25) conferred increased odds of incident asthma, with an odds ratio of 1.51 (95% confidence interval [1.27-1.80]). A dose-response effect of elevated BMI on asthma incidence was observed; the odds ratio for incident asthma for normal weight versus overweight was 1.38 [1.17-1.62] and was further elevated for normal weight versus obesity 1.92 [1.43-2.59], p<0.0001 for the trend. A similar increase in the odds of incident asthma due to overweight and obesity was observed in both men (1.46 [1.05-2.02]) and women (1.68 [1.45-1.94]), p=0.232 for the comparison. Conclusions: Overweight and obesity are associated with a dose-dependent increase in the odds of incident asthma in both men and women, suggesting asthma incidence could be reduced by interventions targeting overweight and obesity.

Key words: Risk factors, epidemiology, body weight, respiratory tract diseases