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Obese females with asthma have less sensitization to aeroallergens than males and having lower odds for controlled atopic asthma.

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Background: Obesity-related asthma is associated with increased severity and female dominance. Increased aeroallergen sensitization is common in asthma. However, it is still unclear to what extent aeroallergen sensitization is related to obesity and modified by gender in asthma patients. We examined the frequency of sensitization to aeroallergens by obesity and gender amongst patients with asthma.

Materials and methods: Within the West Sweden Asthma Study, of 2006 subjects that underwent extensive clinical examinations, 878 had active asthma. Sensitization to aeroallergens, animal, pollen, and mites was defined as a positive IgE level ≥ 0,35 kUA/L.

Results: Most of the 878 patients with asthma were women (60%). Among the 878 patients, 32% were lean (BMI < 25), 41% were overweight (BMI 25-29.32%), and 27% were obese (BMI > 30%). Females dominated each group (66 /55/60,75 % respectively). In lean patients with asthma, no differences in sensitization to any aeroallergen between women and men (58% vs. 66%, p=0.178) were found. However, in overweight (44% vs. 72 %, p< 0,001) and obese (36 % vs. 58 %, p=0,001), women were significantly less often sensitized than men. The same pattern was observed in poly-sensitization status (sensitization to ≥2 aeroallergens). Obese women had a lower odds ratio for atopic asthma (0.59 95% CI 0.38-0.91) than men. Within obese patients with atopic asthma, women had a higher odds ratio for uncontrolled (ACT<20) asthma (2.37 (1.01-5.58) than men (0.90 (0.32 -2.71).

Conclusions: Our data showed that obesity and the female sex are associated with the atopic phenotype and asthma severity. This confirms previous observations in a large community-based population, suggesting that obese women may have altered immune responses. We need more translational mechanistic studies to elucidate the underlying mechanisms.