# The Effects of Adiposity on Disease and Symptom Severity in Eosinophilic Esophagitis

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**Introduction:** Eosinophilic esophagitis (EoE) is a chronic allergic Th2-driven inflammatory disease of the esophagus characterized by esophageal dysfunction and eosinophilic inflammation of the esophageal mucosa. Studies have suggested Th2 immune responses are promoted by leptin, an adipokine shown to be upregulated with increased adiposity. Obesity has also been suggested as the underlying driver to the Th2 immune response in murine studies of EoE. Accordingly, our objective was to investigate the relationship between adiposity and EoE disease activity in pediatric patients.

**Hypothesis:** We hypothesized that increased BMI z-score would be associated with increased histologic and disease severity through an obesity-associated exacerbation of the Th2 immune response in EoE.

**Methods:** We used the Cincinnati Center for Eosinophilic Disorders (CCED) Eosinophilic Gastrointestinal Disorder (EGID) database (n=600) and the CCED EoE Symptom database (n=100) to analyze patient data. Disease severity was determined from the evaluation of esophageal biopsies by the Histological Scoring System (HSS), which assessed the grade and stage of 8 histologic features. Symptom data were acquired from the Pediatric EoE Symptom Score questionnaire which assessed the frequency and severity of symptoms in four domains. We only included data from patients with active EoE, defined as having ≥15 eosinophils per high-powered field on esophageal biopsy. Subjects were stratified into BMI z-score quartiles and mean values of HSS, symptom severity, and symptom frequency were compared between quartiles via one-way ANOVA.

**Results:** 103 subjects (ages 5-18, median age 10.8, 19 females) from the EGID database and 71 subjects (ages 6-18, median age 9.8, 6 females) from the EoE Symptom database met the inclusion criteria. There was no difference in HSS scores, nor in symptom frequency, of pediatric EoE patients between BMI z-score quartiles. When compared to patients of normal adiposity (-1>BMI z-score<1), patients with greater adiposity (BMI z-score>1) presented with more severe symptom scores ($p<0.05$).

**Conclusion:** Our findings suggest that there is no correlation between adiposity and histologic severity nor symptom frequency in pediatric EoE patients. However, we observe a positive correlation between adiposity and symptom severity that merits further investigation, especially into the potential role of leptin as a mediator in this relationship.

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