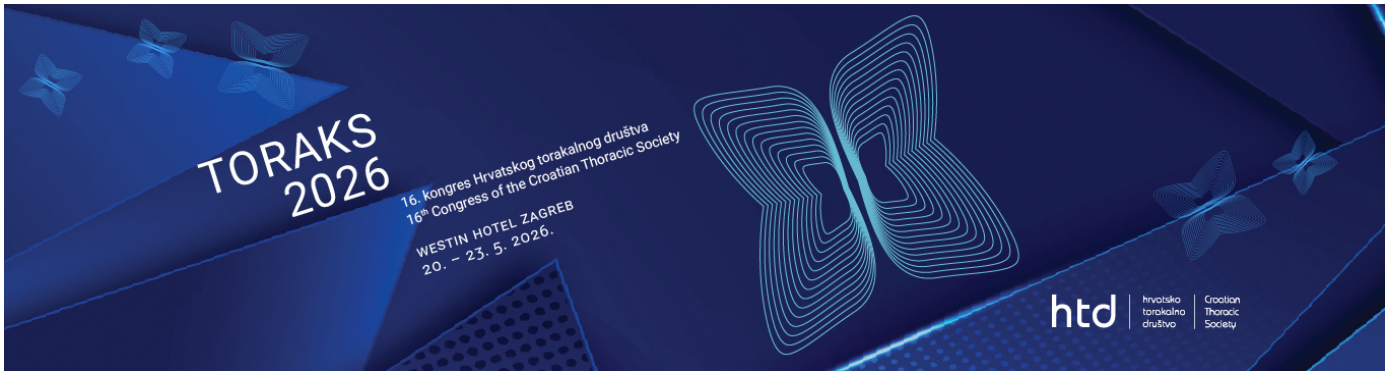


WEIGHT LOSS AS A DISEASE-MODIFYING STRATEGY IN SEVERE ASTHMA: THE ROLE OF ADIPOCYTE DRIVEN INFLAMMATION IN CLINICAL TRANSFORMATION WITH GLP-1 RECEPTOR AGONIST THERAPY

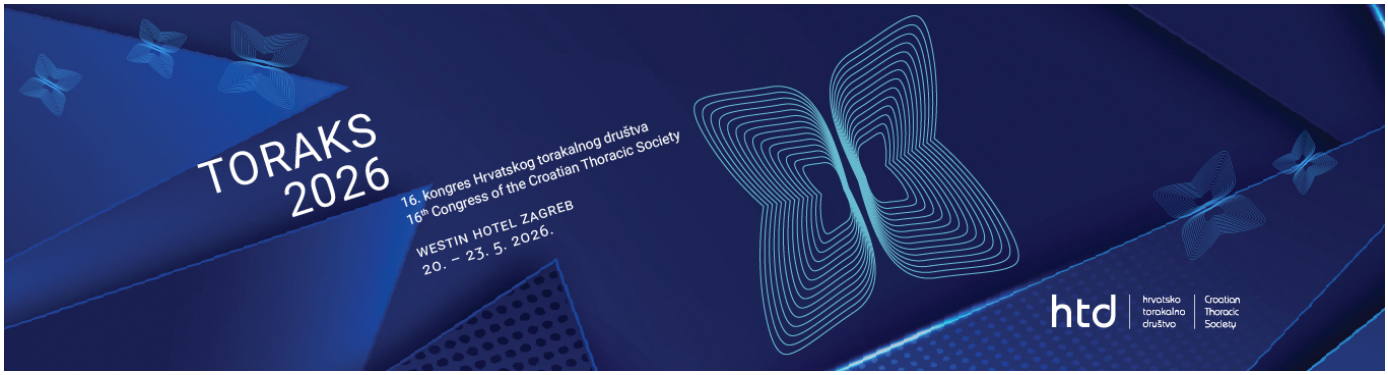
ČUJIĆ T.[1], Pavliša G.[2], Štajduhar A.[2], Miculinić N.[2], Puretić H.[2], Pevec B.[2], Perić Radanović D.[1], Oreški A.[2], Rubil I.[2], Kesić J.[2], Lampalo M.[2]

[1] Klinički bolnički centar Split, Split, Croatia
Klinika za plućne bolesti

[2] Klnički bonički centar Zagreb, Zagreb, Croatia
Klinika za plućne bolesti

Background:

Obesity is increasingly recognized as a key disease-modifying factor in severe asthma, contributing to poor disease control, increased exacerbation risk and reduced responsiveness to standard therapy. Adipose tissue acts as an active endocrine organ, with adipocytes producing proinflammatory mediators such as leptin, IL-6 and TNF-α, which promote systemic low-grade inflammation and may contribute to airway dysfunction. Glucagon-like peptide-1 receptor agonists (GLP-1 RA) have demonstrated metabolic and potential anti-inflammatory effects that may influence both adipose tissue activity and airway disease.



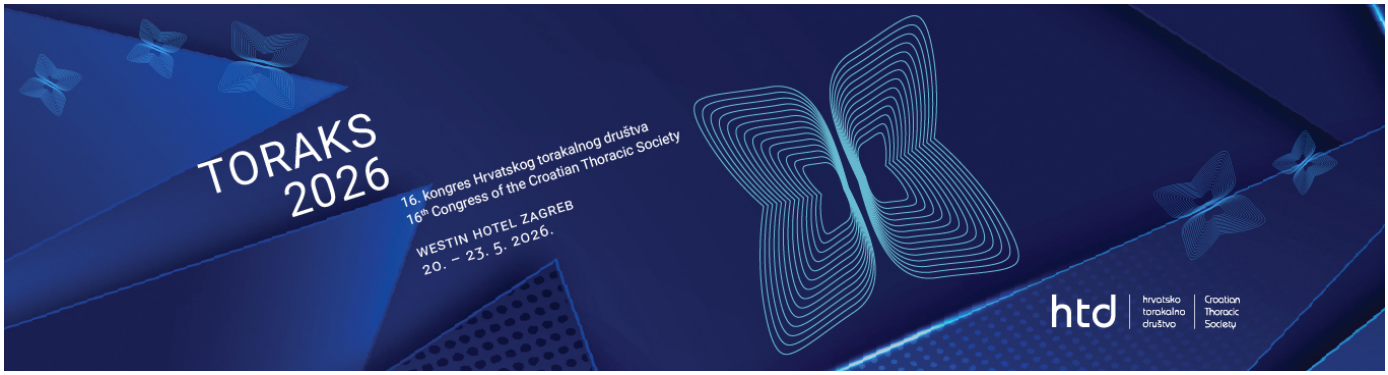
Conclusion:

This case highlights the role of obesity as a disease-modifying condition in severe asthma, likely mediated through adipocyte-driven systemic inflammation. Weight reduction achieved with GLP-1 RA therapy was associated with improved asthma control, elimination of exacerbations and stabilization of lung function. These findings support the concept of targeting metabolic and inflammatory pathways in obese patients with severe asthma and emphasize the importance of integrated management of obesity as a modifiable comorbidity in asthma care.

Case:

A 32-year-old female, diagnosed with severe allergic and eosinophilic asthma at the age of 21. At diagnosis, spirometry revealed mild obstructive ventilatory impairment (FEV1/FVC 0.70; FEV1 64.9%; FVC 80.9%) with a positive bronchodilator response (FEV1 +19.2%; +440 mL). Between 2021 and 2025, the patient experienced frequent exacerbations despite high-dose ICS/LABA therapy and repeated systemic corticosteroid use.

In April 2025, spirometry demonstrated persistent airflow limitation (FEV1/FVC 0.73; FEV1 69%; FVC 80%) with preserved diffusing capacity (DLCO 91%) and low FeNO values (8 ppb). By September 2025, the patient presented with poorly controlled asthma (ACT 13; ACQ 2.67) and class II obesity (BMI 35.4 kg/m^2; body weight 101 kg; height 169 cm). Given the recognized role of adipocyte-mediated inflammation as a contributing factor to poor asthma control,



treatment with a GLP-1 RA was initiated alongside standard asthma therapy.

During seven months of follow-up, the patient achieved significant weight reduction of 18 kg (BMI 29.1 kg/m^2), accompanied by complete cessation of exacerbations since September 2025. Progressive improvement in lung function was observed, from FEV1 69% in April 2025 to stable ventilatory parameters in April 2026 (FEV1/FVC 0.77; FEV1 73%; FVC 79%), with preserved DLCO (88%) and normal FeNO levels (16 ppb). Clinically, asthma control improved substantially, with enhanced exercise tolerance and return to regular physical activity (tennis thrice weekly).