

## THE IMPACT OF INFECTIOUS DISEASES ON EXACERBATIONS OF BRONCHIAL ASTHMA

*Assistant of the Department of allergology,  
clinical immunology and nursing  
of Tashkent Medical Academy  
Nosirova Mexriniso Parda qizi*

**Introduction.** Bronchial asthma (BA) remains one of the most prevalent chronic respiratory diseases worldwide, affecting approximately 300 million people. Despite advances in pharmacological treatment and patient education, acute exacerbations remain a significant clinical and socioeconomic problem. One of the most frequent triggers of asthma exacerbations is infection of the upper or lower respiratory tract, both viral and bacterial. Viral infections - especially those caused by rhinoviruses, influenza, and respiratory syncytial virus - are known to enhance airway inflammation and hyperresponsiveness, resulting in worsening of asthma control. The present study aimed to evaluate the impact of acute infectious diseases on the frequency and severity of asthma exacerbations among adult patients, and to analyze the relationship between specific pathogens and the clinical course of bronchial asthma.

**Keywords:** bronchial asthma; infectious diseases; exacerbation; respiratory viruses; inflammation; asthma control

**Materials and Methods.** A prospective observational study was conducted from January to December 2024 at the Republican Specialized Scientific and Practical Center of Allergology and Clinical Immunology. A total of 120 adult patients (aged 18–65 years) with a confirmed diagnosis of bronchial asthma according to GINA 2023 criteria were enrolled.

Patients were divided into two groups:

**Group I (n = 60):** patients who experienced at least one episode of respiratory infection during the study period.

**Group II (n = 60):** patients without documented infections during the same period.

The diagnosis of infection was confirmed clinically and by laboratory methods (complete blood count, CRP, and identification of viral or bacterial pathogens using PCR and serological tests).

Asthma control and exacerbation frequency were assessed using the Asthma Control Test (ACT) and the rate of exacerbations requiring systemic corticosteroids or hospitalization. Pulmonary function was evaluated by spirometry (FEV<sub>1</sub>, FVC, FEV<sub>1</sub>/FVC ratio). Statistical analysis was performed using SPSS v.26.0. Results were considered significant at  $p < 0.05$ .

**Results and Discussion.** During the study period, infection-associated **exacerbations** accounted for approximately **68% of all asthma exacerbations** recorded among participants. In Group I, the mean number of exacerbations per patient per year was  $2.4 \pm 0.6$ , compared to  $0.9 \pm 0.3$  in Group II ( $p < 0.01$ ).

The most common pathogens identified were rhinovirus (35%), influenza A (22%), and *Streptococcus pneumoniae* (18%). Viral infections, particularly rhinoviral and influenza-associated, were linked to a more pronounced decline in FEV<sub>1</sub> (average decrease of 18% from baseline) and more prolonged recovery periods compared to bacterial infections.

CRP levels and blood eosinophil counts were significantly higher during infection-related exacerbations, suggesting an additive effect of infection-induced inflammation on eosinophilic airway inflammation typical of asthma.

These findings are consistent with previously published data indicating that respiratory infections act as potent triggers for asthma exacerbations by promoting

airway epithelial damage, cytokine release (IL-4, IL-5, IL-13), and enhanced bronchial hyperreactivity. Moreover, recurrent infections may impair long-term asthma control by maintaining low-grade inflammation even after clinical recovery.

**Conclusions.** Our study confirms the significant role of infectious diseases - especially viral respiratory infections - in precipitating and aggravating asthma exacerbations. Patients with bronchial asthma should be considered a high-risk group during seasonal outbreaks of viral infections.

Preventive strategies such as annual influenza vaccination, timely antiviral therapy, optimal asthma control with inhaled corticosteroids, and patient education are essential to reduce infection-associated exacerbations.

Further studies involving larger populations and molecular analysis of pathogen-host interactions are necessary to develop targeted preventive and therapeutic interventions aimed at minimizing infection-related asthma morbidity.