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CLINICAL INTERRELATIONSHIPS BETWEEN GASTROESOPHAGEAL REFLUX DISEASE AND BRONCHIAL ASTHMA IN CHILDREN

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Abstract: The article describes the clinical features and possible pathogenetic relationships of gastroesophageal reflux disease (GERD) in children with bronchial asthma (BA). One of the factors contributing to the development of GERD in patients with BA is chronic hyperergic-associated inflammation in the fundal and cardiac regions of the stomach. A total of 65 children aged 6 to 17 years with varying degrees of asthma severity were examined. Clinical-anamnestic, instrumental (24-hour pH monitoring, spirometry), and laboratory methods were used. The results indicate a strong association between severe asthma and GERD, which represents an unfavorable prognostic sign, as it increases the likelihood of transformation from mild to severe asthma. Signs of GERD were detected in 43 (66.2%) children with asthma, more often in cases of uncontrolled disease. Patients with both BA and GERD showed reduced forced expiratory volume in one second (FEV_1) and peak expiratory flow, as well as more frequent nocturnal symptoms. The findings confirm the need for screening and correction of reflux disorders in children with asthma to optimize therapy and improve disease control.

Keywords: bronchial asthma, gastroesophageal reflux disease, children, respiratory function, comorbidity.

Introduction:

Bronchial asthma (BA) is one of the most common chronic diseases of the respiratory tract in children, characterized by airway inflammation and bronchial hyperresponsiveness. In recent years, increasing attention has been directed toward the study of comorbid conditions that may influence the course and control of asthma. Among these, gastroesophageal reflux disease (GERD) occupies a special place due to its close anatomical, physiological, and pathogenetic relationship with the respiratory system.

The mechanisms underlying the interaction between GERD and BA include vagally mediated reflex responses, microaspiration of acidic gastric contents, and systemic inflammation. These factors may exacerbate bronchial hyperresponsiveness, provoke cough and nocturnal symptoms, and reduce the effectiveness of baseline asthma therapy.

Despite a substantial number of studies addressing this issue, data on the prevalence and clinical characteristics of GERD in children with varying degrees of asthma severity remain limited, which underscores the relevance of the present study.

Aim of the study: To investigate the prevalence and clinical characteristics of gastroesophageal reflux disease in children with bronchial asthma, as well as to assess the impact of GERD on the course and control of asthma.

Methods: The study included 65 children with a confirmed diagnosis of bronchial asthma who were observed and treated at City Clinical Children's Hospital No. 1 in Tashkent. All patients had bronchial asthma of varying severity and underwent esophagogastroduodenoscopy (EGD). The patients' ages ranged from 6 to 15 years (mean age 11.3 ± 2.7 years); 38 were boys (58.5%) and 27 were girls (41.5%).

To assess dyspeptic and respiratory symptoms, a scoring scale was used:
0 points — symptom absent;
1 point — mildly expressed;
2 points — moderately expressed;
3 points — severely expressed.
Depending on the level of asthma control, patients were divided into three groups:
• fully controlled asthma — 20 patients (30.7%);
• partially controlled asthma — 26 patients (40.0%);
• uncontrolled asthma — 19 patients (29.3%).
The diagnostic algorithm included:
• clinical and anamnestic assessment (evaluation of complaints, disease duration, characteristics of cough, and frequency of nocturnal symptoms);
• spirometry (FEV_1, PEF);
• 24-hour esophageal pH monitoring;
• Asthma Control Test (ACT);
• statistical data analysis (t-test, χ^2 test, $p < 0.05$).

Results of the study: Signs of gastroesophageal reflux disease (GERD), based on medical history, clinical presentation, and pH monitoring data, were identified in 43 children with bronchial asthma (66.2%). In children with uncontrolled asthma, the prevalence of GERD was significantly higher (84.2%) compared with patients with controlled disease (40.0%, $p < 0.01$).

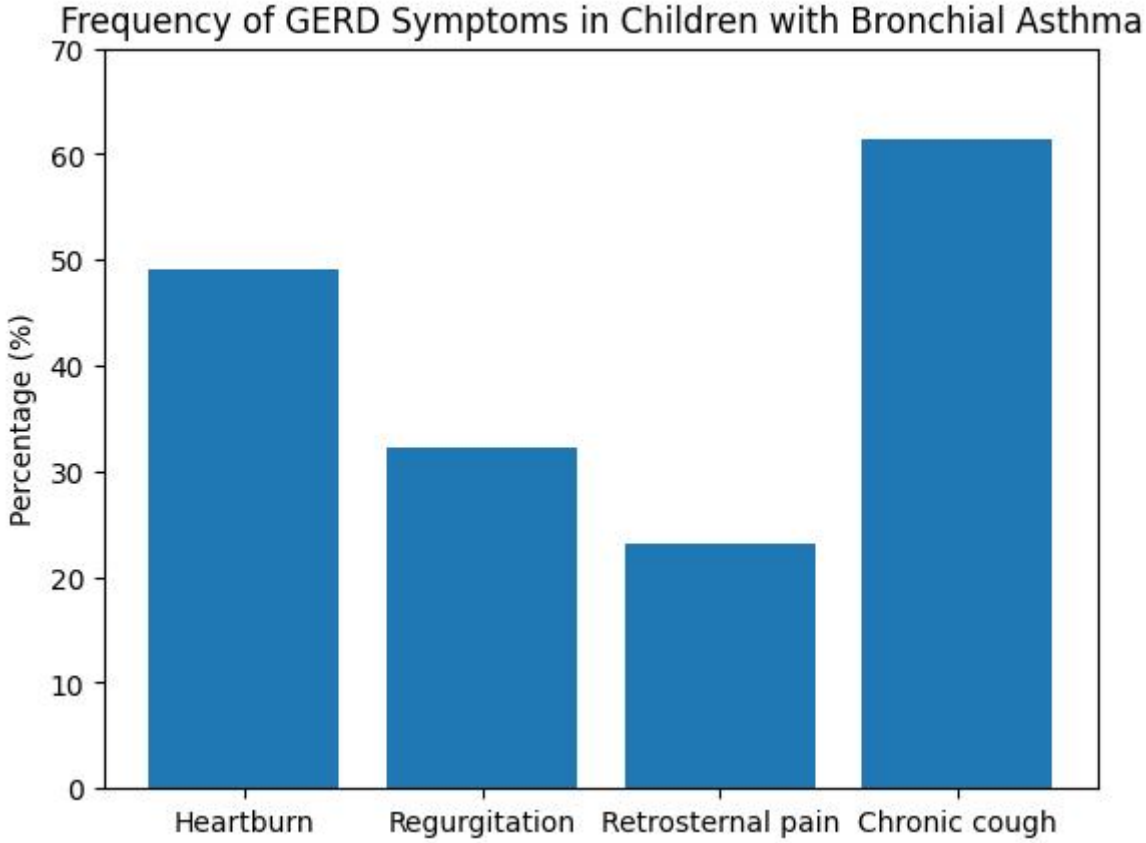
The main GERD-related symptoms included heartburn (49.2%), regurgitation (32.3%), retrosternal chest pain (23.1%), and chronic cough (61.5%). The mean FEV_1 value in children with combined asthma and GERD was 78.5 ± 6.3%, which was significantly lower than in children without reflux (89.7 ± 5.8%, $p < 0.05$).

The table presents the main study outcomes in 65 children with bronchial asthma, including the prevalence of gastroesophageal reflux disease (GERD), clinical symptoms, pulmonary function parameters, and changes observed after antisecretory therapy.

№	Parameter	Value	Note
1	Total number of examined children	65	Age6–15 year old
2	Presence of GERD signs (based on medical history, clinical findings, and pH monitoring)	43 (66,2%)	—
3	Prevalence of GERD in uncontrolled bronchial asthma	84,2%	$p < 0,01$
4	Prevalence of GERD in controlled bronchial asthma	40,0%	—
5	Heartburn	49,2%	Main symptom
6	Regurgitation	32,3%	—
7	Retrosternal pain	23,1%	—
8	Chronic cough	61,5%	Frequently nocturnal
9	Mean FEV_1 in children with asthma and GERD	78,5 ± 6,3%	$p < 0,05$
10	Mean FEV_1 in children without GERD	89,7 ± 5,8%	—
11	Asthma Control Test (ACT) score in children with asthma and GERD	17,4 ± 2,8	$p < 0,05$

12	Asthma Control Test (ACT) score in children without GERD	21,1 ± 3,0	—
13	Atopic dermatitis	20,0%	Every fifth child
14	Concomitant gastrointestinal pathology	64,6%	—
15	Improvement in asthma control after therapy	68%	Omeprazole or esomeprazole for 4 weeks
16	Mean ACT score after therapy	21,3 ± 2,5	Increase by 22%
17	Mean FEV_1 after therapy	86,1 ± 5,7%	Increase by 9,6%

Figure 1. Frequency of gastroesophageal reflux disease (GERD) symptoms in children with bronchial asthma:



In patients with comorbidity, nocturnal coughing episodes, increased need for β₂-agonists, and lower Asthma Control Test (ACT) scores were observed more frequently (17.4 ± 2.8 vs. 21.1 ± 3.0, $p < 0.05$).

Concomitant gastrointestinal pathology was identified in the majority of the examined children, while atopic dermatitis was present in every fifth child.

The administration of proton pump inhibitors (omeprazole or esomeprazole) for 4 weeks as part of комплексной therapy contributed to improved asthma control in 68% of patients.

Conclusions:

Among comorbid pathological conditions associated with bronchial asthma, gastroesophageal reflux occupies a prominent place. The high prevalence of GERD symptoms in patients with

bronchial asthma and their mutual influence confirm the need for thorough evaluation of the upper gastrointestinal tract in children with asthma, particularly in cases of resistance to standard therapy.

Unresolved issues remain regarding the impact of antisecretory therapy on objective parameters of pulmonary function in patients with coexisting GERD and asthma, as well as the potential negative effect of bronchodilators on lower esophageal sphincter tone.

Patients with combined pathology require a comprehensive treatment approach that includes anti-reflux and antisecretory therapy (proton pump inhibitors, prokinetics, and antacids) in combination with standard anti-asthmatic therapy (inhaled glucocorticosteroids and long-acting β_2-agonists).

1. Gastroesophageal reflux disease is detected in approximately two thirds of children with bronchial asthma, predominantly in those with an uncontrolled course of the disease.
2. The presence of GERD is associated with impaired pulmonary function parameters and a reduced level of asthma control.
3. Incorporating the diagnosis and management of reflux disorders into the standard evaluation of children with bronchial asthma contributes to improved treatment effectiveness and enhanced quality of life for patients.

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