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**COMPARATIVE ANALYSIS OF RESPIRATORY FUNCTION AND CARDIAC
ELECTROPHYSIOLOGY IN PATIENTS WITH OBSTRUCTIVE SYNDROMES: A 30
CASE CLINICAL REVIEW**

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Relevance. The clinical distinction between Bronchial Asthma (BA) and Chronic Obstructive Pulmonary Disease (COPD) often proves challenging due to their overlapping respiratory symptoms. While both conditions involve airway obstruction, their long-term impact on cardiac hemodynamics and the development of "cor pulmonale" differ significantly. Chronic alveolar hypoxia and hyperinflation, particularly in COPD, lead to anatomical changes in the right heart that manifest as specific electrical patterns. Identifying these markers such as P-pulmonale, axis deviation, and low voltage complexes is essential for recognizing secondary cardiac involvement and aiding differential diagnosis in acute or resource-limited clinical settings

Aim: this study sought to compare electrocardiographic (ECG) patterns in patients with Bronchial Asthma and COPD to identify reliable markers of right heart strain and electrical voltage changes. By analyzing 30 clinical cases, the research evaluated the diagnostic utility of the 12-lead ECG in distinguishing between these two obstructive pathologies and assessing their respective impacts on cardiac electrophysiology.

Materials and methods. This retrospective study involved the clinical and instrumental analysis of 30 patient cases diagnosed with obstructive airway diseases, specifically Bronchial Asthma (n=16) and Chronic Obstructive Pulmonary Disease (n=14). The data was collected from the Department of Pulmonology at the 6th City Clinical Hospital in Minsk. Patients were selected based on confirmed clinical diagnoses and the availability of complete medical records, including smoking history and demographic data. The primary focus of the investigation was the analysis of 12-lead electrocardiograms (ECG) recorded during the period of clinical observation.

Results and their discussion. The most significant finding was the marked difference in lung function between groups: FEV1 (BA $60.2 \pm 20.7\%$ vs COPD $35.3 \pm 12.5\%$, $p=0.054$) and Tiffeneau Index (BA 58.8 ± 12.4 vs COPD $44.0 \pm 9.7\%$, $p=0.063$), both approaching statistical significance and representing strong clinical trends that remain the most reliable differentiators between cohorts. Regarding ECG findings, low voltage complexes were entirely exclusive to the COPD cohort (22.2% vs 0.0% in BA, $p=0.103$), characteristic of pulmonary hyperinflation increasing chest wall distance. P-pulmonale/right heart overload showed a trend toward the BA group (27.8% vs 0.0% in COPD, $p=0.136$), which reflects acute hemodynamic stress during hospitalization or exacerbation related dynamic hyperinflation. Heart rate showed no significant difference (BA 94.9 ± 21.0 bpm vs COPD 90.0 ± 21.8 bpm, $p=0.582$), suggesting similar levels of sympathetic activation or β_2 -agonist use. In the total cohort, P-pulmonale/right heart overload was present in 16.1% (5 cases), low voltage complexes in 9.7% (3 cases), and right axis deviation in 3.2% (1 case). These findings allow distinction of the two pathologies not just by spirometry but by their secondary cardiac manifestations.

Conclusions. Lung function parameters (FEV1 and Tiffeneau Index) remain the most statistically reliable markers for distinguishing BA from COPD. However, the 12-lead ECG provides valuable adjunctive information: low voltage complexes are uniquely associated with COPD, while P-pulmonale/right heart overload trends toward BA during acute exacerbations. These hypothesis-generating findings support the ECG's utility as a complementary diagnostic tool, particularly in resource-limited settings where spirometry may be unavailable.