

The role of natriuretic peptides in proactive management of COPD in the absence of overt heart failure: a scoping review

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Abstract

Background: COPD exacerbations (Es) increase the risk of cardiovascular (CV) events and future Es, necessitating improved cardiopulmonary risk prediction. We aimed to evaluate the role of natriuretic peptides (NPs) in improving risk prediction and proactive management of COPD patients without overt heart failure (HF).

Methods: We searched PubMed, Google Scholar for articles published from 2015 to 2025. After deduplication, 158 titles and abstracts were screened. 15 observational studies and 1 RCT were included.

Results: Brain NP (BNP) and N-terminal pro-BNP (NT-proBNP) are valuable biomarkers for identifying COPD patients at high risk of adverse events and death, even without a prior CV history. Factors contributing to increased BNP/NT-proBNP include previously unrecognized HF, severe airway obstruction, chronic hypoxia, hyperinflation, Es, and pulmonary hypertension (PH). 1 SD increase in baseline NT-proBNP linked to a 13% rise in the risk of Es.

FEV₁ is inversely related to NT-proBNP. A rapid decline in FEV₁ predicts a 4-fold increase in the risk of HF within a year. Lower levels of α 1-antitrypsin are associated with higher levels of BNP. BNP gene polymorphisms linked with COPD, complicated with PH. Increased midregional proatrial NP indicates the risk of osteoporotic fractures.

Treatment with nebulized salbutamol increased NT-proBNP levels. Decreased PaCO₂ during noninvasive positive pressure ventilation is linked to lower proBNP levels. Irbesartan and hydrochlorothiazide reduced NT-proBNP in Es.

Conclusions: NPs are promising biomarkers that can enhance clinical decision-making and proactive management in COPD patients when used alongside other diagnostic tools.

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