Prevalence, management and impact of chronic obstructive pulmonary disease in atrial fibrillation: a systematic review and meta-analysis of 4,200,000 patients

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Background: Multimorbidity is a major concern in patients with atrial fibrillation (AF). Among other diseases, the prevalence of chronic obstructive pulmonary disease (COPD) in these patients is unclear, and its association with adverse outcomes is often overlooked. Moreover, uncertainties on the treatment of patients with both AF and COPD still exist, and may lead to undertreatment.

Purpose: The aim of this study is to estimate the prevalence of COPD, and its impact on management and outcomes in patients with AF.

Methods: A systematic review and meta-analysis was conducted according to PRISMA guidelines. All studies reporting the prevalence of COPD in AF patients were included and pooled. Data on comorbidities, beta-blockers (BBs) and oral anticoagulant (OAC) prescription, and outcomes (all-cause death, cardiovascular death, ischemic stroke, major bleeding) were pooled and compared according to COPD status; the impact of BBs on outcomes in patients with COPD was also investigated. All analyses were performed using random-effect models; subgroup analysis and meta-regressions were also performed to account for heterogeneity.

Results: Among 46 studies, the pooled prevalence of COPD was 13% (95% Confidence Intervals (CI): 10-16%), with high heterogeneity between studies; significant differences were found according to geographical locations and definition of COPD. A multivariable meta-regression model which included age, female sex, history of hypertension, diabetes and chronic heart failure (CHF) was able to explain a significant proportion of the heterogeneity (R2 = 69.8%). COPD was associated with a higher prevalence of diabetes, coronary artery disease, CHF and stroke (Fig. 1, panel A), as well as higher CHA2DS2-VASc scores and age (Fig. 1, panel B), and lower probability of BB prescription (Odds Ratio (OR): 0.77, 95%CI: 0.61-0.98). Patients with COPD showed higher risk of all-cause death (OR: 2.22, 95%CI: 1.93-2.55), cardiovascular death (OR: 1.84, 95%CI: 1.39-2.43) and major bleeding (OR: 1.45, 95%CI: 1.17-1.80) (Fig.1, Panel C); no significant differences in outcomes were observed according to BBs use in AF patients with COPD (Fig. 1, panel D).

Conclusion: COPD is common in AF, being found in 1 every 8 patients, and is associated with an increased burden of comorbidities, differential management and worse outcomes, with more than two-fold higher risk of all-cause death and increased risk of CV death and major bleeding. Therapy with BBs does not increase the risk of adverse outcomes in these patients.

Abstract Figure.