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Competitive interaction between Chronic Obstructive Pulmonary Disease and CHA_2DS_2-VASc in predicting incident atrial fibrillation

Maria Perticone

University Magna Graecia of Catanzaro, Italy

Statement of the Problem: Chronic obstructive pulmonary disease (COPD) is a leading cause of morbidity and mortality, and an emerging risk factor for atrial fibrillation (AF). $CHADS_2$ and CHA_2DS_2-VASc scores are significantly associated with incident AF independently of other risk factors. The aim of this study was to demonstrate a possible interaction between COPD and CHA_2DS_2-VASc in predicting incident AF.

Methodology & Theoretical Orientation: This observational prospective cohort study included 4,322 Caucasians with cardiovascular risk factors, stratified by CHA_2DS_2-VASc score (>2 vs. <2) and presence/absence of COPD. To detect AF appearance, every six months the patients underwent physical examination, standard 12-lead electrocardiogram and routine laboratory tests.

Findings: COPD prevalence was significantly higher in patients with CHA_2DS_2-VASc >2 vs. CHA_2DS_2-VASc <2 category (13.3% vs. 10.5%, P = 0.009). During the follow-up, 589 cases of AF were documented (3.8 events/100 patients-year). COPD+ showed a significantly higher incidence of AF vs. COPD- patients (17.4 vs. 8.4 events/100 patients-year, P < 0.0001). In Cox regression models both CHA_2DS_2-VASc score (HR =4.70, 95% CI =3.63–6.08) and COPD (HR =2.04, 95% CI =1.69–2.48) significantly predicted the incidence rate of AF; this was also confirmed introducing the two variables into the same Cox model. A significant competitive interaction between CHA_2DS_2-VASc and COPD was found in a Cox model in patients with CHA_2DS_2-VASc <2 (HR =8.45, 95% CI =5.20–13.74) than in those with CHA_2DS_2-VASc >2.

Conclusion & Significance: COPD is an independent ad strong predictor of incident AF. The presence of COPD increases the HR for incident AF about five times in patients with CHA_2DS_2-VASc score <2, while the coexistence of a CHA_2DS_2-VASc score >2 minimizes the prognostic significance of COPD.

mariaperticone@hotmail.com

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