Editor's Note: Authors are invited to respond to Correspondence that cites their previously published work. Those responses appear after the related letter. In cases where there is no response, the author of the original article declined to respond or did not reply to our invitation.

Prognostic Implication of Resting Heart Rate and Its Modulation in Patients With Acute Pulmonary Embolism

To the Editor:
We have read with great interest the article in this issue of CHEST by Jaureguízar et al1 that demonstrated that higher resting heart rate was associated with worse outcomes in patients with acute pulmonary embolism. Modification of the heart rate cutoff in the clinical prognostic score with the use of their findings improved prognostication. We have two concerns that should improve their findings.

First, the prognostic impact of resting heart rate might be different between atrial fibrillation and sinus rhythm in patients with acute pulmonary embolism, as has been discussed often in the general cardiovascular cohorts. Atrial fibrillation is observed in 20% of patients with acute pulmonary embolism; such a cohort had higher mortality rates than those with sinus rhythm.2 Furthermore, atrial fibrillation, in general, accompanies higher heart rate than sinus rhythm. Given together, it might be encouraged to separate both rhythms to investigate the prognostic impact of heart rate in their cohort.

Second concern is the implication of heart rate modulation in patients with acute pulmonary embolism. Tachycardia is harmful on the right ventricle, particularly when the right ventricle is impaired like pulmonary embolism, by shortening the diastolic phase and reducing cardiac forward flow.3 In the animal experimental models with pulmonary hypertension, heart rate modulation with the use of ivabradine and beta-blocker improved right ventricular function.4 On the contrary, extreme heart rate reduction rather might reduce cardiac output and worsen clinical outcomes.5 Further studies are warranted to investigate the implication of optimal heart rate modulation therapy in patients with acute pulmonary embolism.

Response

To the Editor:
We thank Dr Izumida and colleagues for their thoughtful comments about our study on the association between heart rate and prognosis in patients with acute pulmonary embolism (PE).1 Previous studies have shown an association between both preexisting and newly incident atrial fibrillation and adverse outcomes in patients with acute symptomatic PE.2 Importantly, when we repeated the analysis after excluding patients with atrial fibrillation, tachycardia was still associated with a three-fold increased risk of dying (see Table 4 in the original article). The authors hypothesized about the potential efficacy of heart rate controllers in patients with PE and tachycardia. Though we like the suggestion, the RIETE registry was not designed originally to evaluate the efficacy and safety of various interventions in PE. Results of carefully designed randomized trials might provide opportunities for in-depth assessment and may be pursued in future.

References