

AUTHOR'S REPLY

Response to Letter by Kataoka and Imamura Regarding Article, "Short P-Wave Duration Is Associated with Incident Atrial Fibrillation"

We thank Dr. Kataoka and Dr. Imamura for their comments on our study.^{1,2)}

The first concern was that the incidence of atrial fibrillation (AF) in the present study was higher than in other healthy cohort studies.^{1,2)} We found an AF-incidence of 17.6/1000 person-years (21.5% prevalence) during 15-years of follow-up in an elderly population aged ≥ 70 years,¹⁾ which is comparable with the results of a large German study on a similar cohort.³⁾ Dr. Kataoka refers to a Japanese epidemiological study showing a much lower prevalence of AF in the elderly as compared to our results although the collected population health data was based on periodic examination, which may explain the discrepancy.²⁾

Moreover, it is the incidence rate rather than the prevalence that should be used for comparisons. It is also important to compare incidence rates between studies in relation to the mean age of the cohort, the sex-distribution, and the length of the follow-up. Regarding comorbidities at baseline, 6.4% of the cohort had a history of myocardial infarction, 3.3% had suffered from a stroke, 2.5% had a history of heart failure, 5.1% had undergone coronary revascularization, and 30.9% were on some type of antihypertensive treatment. Given this background, the population seems comparable with others.

The second concern pertained to the recognition of short P-wave duration and measurements of P-waves. The recognition of short P-waves has, however, not been emphasized in the medical literature, which is related to the lack of knowledge of their meaning. We provided a detailed description and examples of these measurements by a validated Eclysis algorithm, subsequently checked by experienced cardiologists and adjusted if needed. In the case of biphasic P-waves, the second negative deflection was included in the P-wave as shown in Figure 1 in the paper.¹⁾ It is therefore unlikely that negative deflections were missed and the P wave duration underestimated. Unfortunately, the analogue 12-lead ECGs are stored in a fashion that makes them extremely time-consuming to access with our current equipment (but possible if absolutely necessary). We agree that a comparison between monophasic and biphasic P-waves would be of additional value, but it requires an analysis of the analogue ECGs.

The third concern was about the causal relationship between P-wave duration (Pdur) and development of AF.²⁾

In our study we made no distinction between the types of AF during follow-up, although it is assumed that the onset or triggering of AF is caused by pulmonary vein electric activity while the perpetuation of AF is related to atrial remodeling (electric and structural).¹⁾ Atrial remodeling tends to increase the ectopic or reentrant atrial activity as well, enhancing the triggers.⁴⁾ Pulmonary vein triggers have been shown to trigger both paroxysmal and persistent AF, but with time AF begets AF and combined with cardiovascular risk factors, atrial structural remodeling evolves with the development of fibrosis, which delays atrial conduction and results in prolonged P wave duration. We agree that the causality between prolonged Pdur and development of AF is difficult to prove since both conditions are part of a progressive cardiovascular disease state.

Our finding of an association between the short P-wave duration and incident AF was somewhat unexpected. We hypothesized several potential mechanisms such as the autonomic system, heritability, or relaxin. The found association was U-shaped, but not significant for prolonged Pdur presumably due to the limited number (2%) of subjects with prolonged Pdur in our cohort.

The major concern was whether the Pdur could be a therapeutic target. We believe that the Pdur is a valuable and feasible risk marker for new-onset AF, and can easily be made available on ECG printouts, which would enhance its utilization in clinical practice for risk stratification.

In summary, we believe that our results support the usefulness of the Pdur on ECG as a new marker for new-onset AF.

Disclosure

Conflicts of interest: Drs. Bozena Ostrowska (BO), Lars Lind (LL) and Elena Sciaraffia (ES) have nothing to disclose. Dr. Carina Blömstrom-Lundqvist (CBL) reports personal fees from Bayer, Medtronic, CathPrint, Octopus, Sanofi Aventis, and Boston Scientific.

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Received for publication August 21, 2022. Revised and accepted October 17, 2022.

Released in advance online on J-STAGE March 15, 2023.

doi: 10.1536/ihj.22-454

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