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The growing burden of atrial fibrillation and its consequences

Heart failure not stroke is the most common complication of atrial fibrillation

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Atrial fibrillation is a major public health problem affecting 37 million people worldwide,[1] and conferring an increased risk of stroke, heart failure, myocardial infarction, and death, as well as quantifiable impairment in quality of life.[2] In the English National Health Service (NHS) alone more new cases of atrial fibrillation are diagnosed each year than the four most common causes of cancer combined,[3] and direct expenditure on atrial fibrillation has reached £2.5 billion (€2.9 billion, $3.2 billion).[4]

The lifetime risk of atrial fibrillation has been estimated,[5,6] but whether this has changed over the past two decades is unknown. Furthermore, the comparative risks of later sequelae for individuals with atrial fibrillation, and whether trends are temporal, has yet to be reported. The linked paper by Vinter and colleagues(doi:10.1136/bmj-2023-077209) addresses these important knowledge gaps in a nationwide population based study using the population of Denmark from 2000 to 2022.[7]

Using administrative registry data from 3.5 million individuals, Vinter and colleagues estimate that the lifetime risk of atrial fibrillation for an individual 45 years and older increased from 24.2% to 30.9% between decades 2000-10 and 2011-22, a 28% relative increase. This risk was larger in men than in women and in individuals with prevalent heart failure, myocardial infarction, stroke, diabetes, and chronic kidney disease compared with people who do not have these conditions. Among patients with an incident diagnosis of atrial fibrillation, heart failure was the most frequent complication with a lifetime risk of 41.2%, double that of stroke (21.4%). Comparing the two prespecified periods, lifetime risk of heart failure after an atrial fibrillation diagnosis did not change, but absolute lifetime risks declined by 2.5% for stroke and by 3.9% for myocardial infarction.

Strengths of this observational study include the capture of data for a nationwide population of 3.5 million individuals, and use of sophisticated methods (the Aalen-Johansen estimator) to accurately calculate the cumulative incidence of atrial fibrillation and complications while accounting for left truncation and the competing risk of death. Limitations include the grouping of the population into two 10 year periods, which results in the loss of temporal resolution; the lack of reporting on ethnic group composition of the study population, which influences lifetime risk of atrial fibrillation;[8] and the absence of subgroup analysis by socioeconomic status, which affects incidence and outcomes of atrial fibrillation.[3,9]

The finding that lifetime risk of atrial fibrillation has increased over the past two decades is not surprising because many other studies have shown increasing atrial fibrillation incidence.[3,10] Nonetheless, routinely collected data show that contemporary lifetime risk of atrial fibrillation has increased to one in three because up to 35% of disease burden remains undiagnosed.[11] By contrast, the incidence of myocardial infarction has decreased over recent decades,[12] in association with national programmes of vascular checks to address key risk factors for ischaemic heart disease.[13] This new study reinforces the principle that analogous primary prevention programmes for atrial fibrillation are required to stem the apparent rise in incidence, associated disease burden, and cost.[2,14]

Unfortunately, the evidence base for primary prevention of atrial fibrillation predominantly relies on observational data and post-hoc analyses of data from randomised clinical trials where atrial fibrillation was not prespecified as a primary or secondary endpoint, and occurrence was not systematically collected.[15] As a consequence, international guidelines do not provide specific recommendations for interventions to reduce the risk of newly onset atrial fibrillation.[2,16] While difficulties in identifying a group at sufficiently high risk for atrial fibrillation historically impeded primary prevention trials,[15] opportunities are now available to comprehensively estimate atrial fibrillation risk by considering multiple risk factors.[17,18] As such, Vinter and colleagues' findings should act as a call to prioritise prospective trials in this area.

The analysis is also noteworthy for quantifying long term risks of sequelae after an atrial fibrillation diagnosis. Atrial fibrillation care has improved considerably in recent decades, informed by randomised clinical trials showing that oral anticoagulation, and more recently, catheter ablation, reduce the risk of stroke and death.[19,20] These interventions are being increasingly used worldwide.[21,22] International guidelines emphasise stroke prophylaxis in patients with atrial fibrillation;[2] yet, Vinter and colleagues' analysis shows that the lifetime risk of heart failure outweighs the risk of stroke.

The neglect of heart failure as a complication of atrial fibrillation in international guidelines is conspicuous because, similar to stroke, heart failure is associated with functional limitations, decreased quality of life, and poor prognosis,[23] and the subpopulation who have both atrial fibrillation and heart failure have a significantly increased risk of cardiovascular and all cause mortality.[24] Prospective cohort studies have established factors identifying people at high risk of

heart failure after an atrial fibrillation diagnosis.[23 25] However, whether more intensive interventions directed towards modifiable cardiovascular risk factors could affect their long term incidence of heart failure has not been prospectively tested and requires further investigation.[25]

Interventions to prevent stroke have dominated atrial fibrillation research and guidelines during the study period in Vinter and colleagues' analysis, but no evidence suggests that these interventions can prevent incident heart failure. Alignment of both randomised clinical trials and guidelines to better reflect the needs of the real-world population with atrial fibrillation is necessary because further improvements to patient prognosis are likely to require a broader perspective on atrial fibrillation management beyond prevention of stroke.

This robust observational research by Vinter and colleagues provides novel information that challenges research priorities and guideline design, and raises critical questions for the research and clinical communities about how the growing burden of atrial fibrillation can be stopped.

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