An epidemic of atrial fibrillation?

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Received 6 April 2011; accepted after revision 8 April 2011; online publish-ahead-of-print 18 May 2011

This editorial refers to ‘Trends in the incidence and prevalence of atrial fibrillation in Iceland and future projections’ by H. Stefansdottir et al., on page 1110.

Numerous risk factors pre-dispose to atrial fibrillation (AF), namely, hypertension, heart failure, increasing age, diabetes mellitus, and vascular disease.¹ Due to the ageing population and the increasing prevalence of the known risk factors for AF,² it may be relevant to investigate whether the incidence and prevalence of AF is increasing as well. Indeed, recently Huxley et al.² reported that more than half of the incident AF cases are due to known cardiovascular risk factors, implying that firstly, the incidence of AF will rise with the increasing prevalence of known risk factors; secondly, that other factors, possibly genetic, may have a greater role in the aetiology of AF; and thirdly, it may be possible to avoid a large proportion of the incident AF cases if the prevalence of the already-known risk factors are reduced.

Stefansdottir et al.³ examined trends in the incidence and prevalence of AF in Iceland among all citizens in the capital, Reykjavik, and both hospital admissions and outpatients AF diagnoses were included. The present study found that the incidence of AF increased significantly in women (by 0.9% per year) but not in men (by 0.1% per year) in the study period, 1991–2008.³ The prevalence of AF was projected to increase from 2.0% in 2008 to 4.3% in 2050 and with the expected increase in population size, this would result in a three-fold increase in the number of patients with AF (from 4495 to 13 583 patients).³ The authors estimated the prevalence of AF to be 20% lower than the prevalence in the United States reported by Miyasaka et al.⁷ (2.0% vs. 2.5%), but the increases in projected numbers of patients with AF were similar.

It has previously been demonstrated that the Icelandic population closely resembles the Scandinavian and British populations,³ and hence the present results are likely to be representative of northern European populations. The study included two-third of the Icelandic population and was not restricted to hospital admissions,³ thus making the present results much more generalizable than the results from previous European studies which only examined AF during hospital admissions.⁵,⁶ However, the study did not have access to AF patients diagnosed at their general practitioners, and may be limited by changes in admission threshold (more focus on cardiac disease) and coding practices (e.g. the coding changed from ICD-9 to ICD-10 during the study period).

Overall, the results are plausible, but there is always room for additional studies investigating time trends in the incidence and prevalence of AF, and such studies would certainly be strengthened if general practitioner contacts and diagnoses were included.

A few previous studies have also investigated time trends in the incidence and prevalence of AF, with one of the most influential being conducted in the United States by Miyasaka et al.⁷ This study reported a 0.6% relative increase per year in the incidence of AF during the study period 1980–2000 (with no difference by gender).⁷ The reported incidence of AF and the increase in incidence with advancing age were of the same magnitude as reported from the Framingham study.¹ However, the increase in incidence over time was much lower than previously found in European studies relying on AF hospital admissions.⁵,⁶ Miyasaka et al.⁷ observed a relative increase in incidence of 21% between 1980 and 2000, while the hospital admission-based studies found the incidence of AF to be doubled between 1980 and 1999 (Frost et al.) and 1986 and 1995 (Friberg et al.), respectively.⁵,⁶

Miyasaka et al.⁷ estimated the number of persons with AF to increase three-fold from 5.1 million (prevalence of 2.5%) in 2000 to epidemic proportions of 15.9 million in 2050, with 35% of the increase being due to the increased incidence and 65% being due to the increased population size, and a larger proportion of elderly patients. Another study investigating time trends in the prevalence of AF in the US found a similar increase in the prevalence of AF (2.5-fold until 2050), with an estimate that the number of patients with AF would increase from 2.3 million in 2000 to 5.6 million patients in 2050.⁸ Indeed, the difference in the estimated number of patients with AF in the US in 2050 was 2.8-fold between the two studies. This could perhaps be related to study populations—Miyasaka et al.⁷ investigated patients with a history of AF in the entire population of the Midwest, while Go et al.⁸ investigated patients with current AF in an administrative dataset from a healthcare maintenance organization in California.

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The diehard epidemiologist would argue that the large discrepancies in the estimated time trends in AF bring out the unreliability of this kind of estimate, and it stresses the importance of valid AF diagnoses and a representative study population for these types of studies. Trends in hospital admissions have not been shown to be representative of the average AF patient, the definition of AF (history or present) might be important, and a large ‘real-world’ cohort (not participants of a specific healthcare programme) is of the essence. Projections of the incidence and prevalence of AF in the European population are clearly warranted, and until now, such studies have been conducted primarily in hospitalized cohorts that may be affected by changes in admission threshold and coding practices.5,6,9

The present study, in conjunction with other similar analyses (Miyasaka et al.7 and Go et al.8), underlines the importance of AF as a present and future healthcare burden. Since many of the risk factors that pre-dispose to AF are modifiable, there should be an increased focus on preventing and/or reducing these risk factors, e.g. better control of blood pressure, education on diet, and exercise to avoid obesity, development of hypertension, diabetes, or vascular disease, etc., and optimal medical therapy where risk factors or AF are already present. Regarding the latter, AF confers a substantial risk of stroke and thromboembolism and the 2010 European Society of Cardiology (ESC) guidelines on AF management advocate a more comprehensive risk factor-based approach.10 The guidelines define previous stroke and age ≥75 years as major risk factors of stroke, while heart failure, hypertension, diabetes, vascular disease, age 65–74 years, and female gender are included as ‘clinically relevant non-major’ risk factors.10 Patients with only one non-major risk factor should preferably receive oral anticoagulation, while those with >1 non-major risk factors or ≥1 major risk factor should definitely receive oral anticoagulation (if not contraindicated).10–12 Indeed, any stroke risk factor in association with AF can cause a stroke, and if clinicians are serious about preventing stroke in AF, the most effective treatment is oral anticoagulation therapy.13 Using the new ESC guidelines, only few patients (around 10%) with AF would not be eligible for antithrombotic treatment,14 and the availability of new oral anticoagulant therapies to reduce the risk of stroke and thromboembolism but with a more favourable bleeding risk profile than warfarin is a major advance, allowing more AF patients to have access to, and benefit from, such treatment.15,16

Conflict of interest: J.B.O. has received travel grants from AstraZeneca and Boehringer Ingelheim. D.A.L. has received funding for research, conference travel, and educational symposia from Bayer Healthcare and Boehringer Ingelheim, and is a member of the ACCP9 Writing Committee. G.Y.H.L. has received funding for research, educational symposia, consultancy, and lecturing from AstraZeneca, Boehringer Ingelheim, Bayer, Pfizer/BMS, Biotronic, Astellas, Sanofi, Cardiome, and Merck; is a clinical advisor to the UK NICE Guidelines on AF Management; and is a task force member of the 2010 ESC Guidelines and ACCP9 Writing Committee.

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