Atrial fibrillation: overall cardiovascular risk beyond stroke and current management

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Atrial fibrillation is the most common arrhythmia associated with an increased overall risk for cardiovascular events such as stroke, but also myocardial infarction, heart failure, and death.¹ Although enormous progress has been made in catheter-based management²,³ and in the prevention of stroke with anticoagulants⁴,⁵ and devices,⁶ there are patients in whom the therapeutic approach is uncertain.

In the FAST TRACK 'A randomized controlled trial of atrioventricular junction ablation and cardiac resynchronization therapy in patients with permanent atrial fibrillation and narrow QRS',¹ Michele Brignole and the APAF-CRT Investigators sought to determine whether atrioventricular (AV) junction ablation in conjunction with biventricular (CRT) pacing is superior to pharmacological rate control therapy in reducing heart failure and hospitalization in patients with permanent atrial fibrillation and narrow QRS. They randomly assigned 102 patients with severely symptomatic permanent atrial fibrillation, narrow QRS, and at least one hospitalization for heart failure to AV junction ablation and CRT or to pharmacological rate control therapy (both with a defibrillator according to guidelines). After 16 months, the primary outcome of death due to heart failure, heart failure hospitalization, or worsening heart failure had occurred in 12% in the ablation plus CRT arm and in 38% in the drug arm, with a hazard ratio of 0.38. Significantly fewer patients in the ablation plus CRT arm died or had heart failure hospitalizations for (12% vs. 33%; hazard ratio 0.28), or were hospitalized for heart failure (0% vs. 25%; hazard ratio 0.30). As compared with the drug arm, ablation plus CRT showed a 36% decrease of the specific symptoms and physical limitations of atrial fibrillation at 1 year. Thus, ablation plus CRT is superior to pharmacological therapy in reducing heart failure and improving quality of life in elderly patients with permanent atrial fibrillation and narrow QRS. These findings are further discussed in a thought-provoking Editorial by Lucas V.A. Boersma from the St. Antonius Hospital in Nieuwegein, The Netherlands.⁸

The incidence of atrial fibrillation has increased significantly over the last decades due to age, longstanding hypertension,² diabetes, and heart failure¹⁰,¹¹ with preserved or reduced ejection fraction, but possibly also to changes in population height. Indeed, height is an important risk factor for atrial fibrillation.¹² In their article entitled 'Increasing population height and risk of incident atrial fibrillation: the Copenhagen City Heart Study', Gorm Boje Jensen and colleagues from the Frederiksborg Hospital in Frederiksborg, Denmark assessed the role of changes in population height and atrial fibrillation in 18 852 individuals of the Copenhagen City Heart Study.¹³ During follow-up, age-standardized prevalence of atrial fibrillation increased significantly from 1.35% to 2.11% in men and from 0.67% to 1.07% in women. Incident atrial fibrillation increased four-fold in both men and women. Height was an important risk factor for incident atrial fibrillation, with hazard ratios between 1.35 and 1.65. Population height increased with 3.3 cm for men and 2.1 cm for women, and population-attributable risk for height was 20–30%; Figure 1). Thus, height is a powerful risk factor for atrial fibrillation.

While catheter ablation is currently considered a very valuable alternative therapeutic strategy to medical therapy which in those with heart failure may even reduce mortality,¹⁴ the procedure is not without risk.¹⁵ In their article 'Incidence of complications related to catheter ablation of atrial fibrillation and atrial flutter: a nationwide in-hospital analysis of administrative data for Germany in 2014', Gerhard Steinbeck et al. from the Klinikum Grosshadern in Munich, Germany noted that retrospective studies, registries, and controlled trials may underestimate 'real-world' risks of catheter ablation for atrial fibrillation and flutter.¹⁶ Thus, they assessed complications in a nationwide approach of 33 353 in-hospital cases. For left atrial ablations, the overall complication rate ranged from 11.7% to 13.8% depending on type and site of applied
Figure 1: Developments in male height, measured at military screening at the age of 18 years, from 1911 to 2014 based on 2.2 million male conscripts. Each grey dot represents the yearly average height. The red, orange, and green line represents the predicted 10-year risk of incident atrial fibrillation in the observation period from 1976 to 2017 and forecast period from 2017 to 2060 assuming that height and incident AF are causally related and all other risk factors are being held constant during follow-up (from Marott JL, Skielboe AK, Dixen U, Friberg JB, Schnohr P, Jensen GB. Increasing population height and risk of incident atrial fibrillation: the Copenhagen City Heart Study. See pages 4012–4019).

Figure 2: The association between the metabolic syndrome and non-thromboembolic major adverse cardiac events in patients with atrial fibrillation. CABG, coronary artery bypass graft; MACE, major adverse cardiac events; PCI, percutaneous coronary intervention (from Polovina M, Hindricks G, Maggioni A, Piepoli M, Vardas P, Atanin M, Đikić D, Đuričić N, Milinković I, Seferović PM. Association of metabolic syndrome with non-thromboembolic adverse cardiac outcomes in patients with atrial fibrillation. See pages 4030–4039).
energy, including major complications ranging from 3.8% to 7.2%. Whereas overall complication rates were lower for atrial flutter ablations, interestingly, major complications occurred more frequently. In particular, in-hospital death was four times more common following right than following left atrial ablations. Stratified by centre ablation volume, significantly fewer overall complications occurred in centres performing >100 rather than fewer left atrial ablations annually. Thus, administrative data of all atrial fibrillation ablations in Germany in 2014 revealed higher overall and major complication rates than previously reported. Few patients were treated in low-volume centres, but were exposed to a higher overall complication risk. Atrial flutter ablations were associated with surprisingly high rates of life-threatening complications. Whereas advanced age combined with highly prevalent cardiac, pulmonary, and vascular co-morbidities is likely to play a major role, clinical studies need to address the benefits and safety of catheter ablation in an elderly, diseased population.

Major adverse cardiac events beyond just stroke are associated with atrial fibrillation, particularly in individuals free of overt coronary artery disease. The metabolic syndrome increases cardiovascular risk, but less is known about how it influences outcomes in those with atrial fibrillation. In their article entitled ‘Association of metabolic syndrome with non-thrombo-embolic adverse cardiac outcomes in patients with atrial fibrillation’, Petar M. Seferović and colleagues from the University Clinical Center in Belgrade, Serbia assessed whether the metabolic syndrome affects the risk of major adverse cardiac events in 843 patients with atrial fibrillation, but no coronary artery disease. Metabolic syndrome was present in 35.8%. At 5-year follow-up, 14.0% of patients experienced major adverse cardiac events. Metabolic syndrome conferred a hazard ratio of 1.98 for major adverse cardiac events and for individual outcomes such as infarction (hazard ratio 2.00), revascularization (hazard ratio 2.33), and cardiac death (hazard ratio 2.59). Following propensity adjustment, the association between metabolic syndrome and major adverse cardiac events remained significant. Thus, the metabolic syndrome is common in atrial fibrillation and confers an increased risk of major adverse cardiac events (Figure 2). Given its prognostic implications, prevention and treatment of metabolic syndrome may be mandatory in atrial fibrillation.

The issue is complemented by two Discussion Forum articles. The first is related to the article ‘Resumption of oral anticoagulation following traumatic injury and risk of stroke and bleeding in patients with atrial fibrillation: a nationwide cohort study’ by Laila Staerk and colleagues from the Gentofte University Hospital in Copenhagen, Denmark. In their contribution entitled ‘Oral anticoagulant treatment in the elderly: there is still an unmet need for better individualized risk assessment’ Andrei Codreanu and colleagues from the Centre Hospitalier de Luxembourg comment on the paper.

Lastly, this issue is also complemented with a Discussion Forum article entitled ‘The 2018 ESC-ESH Guidelines for the management of arterial hypertension leave clinicians facing a dilemma in half of the patients’, authored by Philippe Gabrielle Steg and colleagues from the INSERM U698 and Hôpital Bichat-Cl. Bernard in Paris, France. This commentary is a response to the 2018 ESC/ESH Guidelines for the management of arterial hypertension.

The editors hope that this issue of the European Heart Journal will be of interest to its readers.

References


