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Atrial fibrillation in patients with cardiomyopathy – Protecting the vulnerable

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Atrial fibrillation (AF) is a major public health problem, with an estimated global prevalence of over 50 million and accounting for greater than \$20 billion dollars of spending annually in the US alone [1–3]. Staggering as these numbers may be, they are but a lower indication of the future impact that AF will have as the 21st century progresses with an aging population challenged with rising levels of obesity. When considering a health problem of this magnitude, it is essential to consider and address populations that may be particularly vulnerable to effectively guide resources and mitigate the severest of complications. In this issue of *Trends in Cardiovascular Medicine*, Antonopoulos and colleagues contribute towards this aim in their review of the current evidence and unmet needs of the vulnerable and heterogeneous population of patients with both cardiomyopathy (CM) and AF [4].

For the purposes of this review, cardiomyopathies were broadly defined as cardiac conditions with structural and functional cardiac abnormalities, with attention to the subtypes of hypertrophic cardiomyopathy (HCM), arrhythmogenic right ventricular cardiomyopathy (ARVC, often now further abbreviated to ARC), dilated cardiomyopathy (DCM), non-dilated left ventricular cardiomyopathy, and restrictive cardiomyopathy (RCM)/cardiac amyloidosis (CA). While the authors group these conditions together given their shared vulnerability to AF, they are careful to delineate how their diverse pathologies have unique implications for AF, and advocate for a phenotype-specific approach to AF management.

Patients with CM are particularly vulnerable to the development of AF. As an estimate of AF prevalence among the collective cardiomyopathies, the authors cite data from the EURObservational Research Programme (EORP) Cardiomyopathy Registry. This Registry included 3208 adults with CM, and reported 28 % AF prevalence at baseline and 31 % at 1 year follow-up [5]. In considering the generalizability of this Registry and its estimated AF epidemiology, it is important to note that the Registry consisted of 43 % with incident CM vs. 57 % with prevalent CM, which indicates a significant number of patients earlier in their cardiomyopathic disease course, with high potential to accrue further AF over time [6]. Moreover, the Registry comprised predominantly patients with HCM (54 %) and DCM (39 %), while ARVC (4.5 %) and RCM (2.1 %)

were a small minority. The prevalence of AF varied widely among these groups, ranging from 15 % in ARVC to 28 % in HCM to 29 % in DCM and 52 % in RCM. Although there is variation in estimates across subtypes of CM and between CM cohorts summarized by the authors, it is evident that the AF prevalence in CM, regardless of subtype, far exceeds contemporary estimates for the general adult population, which range from 1 to 2 % in Europe and around 4.5 % in the United States [7–9].

CM patients are also more vulnerable to the consequences of AF, including thromboembolism, heart failure (HF), and ultimately mortality [4]. To demonstrate this increased risk, the authors highlight a large retrospective cohort study of CM patients, largely from the United States, that spanned 2 decades [10]. This study featured propensity-score matching for age, sex, race, and comorbidities across the CM subtypes, and demonstrated higher incidences of stroke, hospitalization, and HF in those with AF compared to those without [10]. In this same cohort, patients with HCM and DCM had increased mortality when AF was also present (26 % and 36 % greater, respectively), but in the presence of RCM, AF was not associated with increased mortality. It is unclear if the latter finding is related to the heterogenous nature of the RCM subtype since AF has been shown to be a prognostic factor for all-cause mortality in a more homogenous population of patients with transthyretin amyloid CM [11]. While there are relatively less data regarding the prognostic significance of AF in ARVC, AF has been associated with increased risk of life threatening arrhythmia in the setting of ARVC [12]. Despite efforts to isolate the effect of AF on CM in these studies, it is important to note that it is challenging to control fully for confounding by severity of the underlying CM itself or other comorbidities and to exclude their role in driving adverse outcomes. However, regardless of the exact mechanism, patients with CM and AF do consistently have worse outcomes, and their increased risk of ischemic stroke, which has a more specific pathophysiology, is certainly driven by comorbid AF.

While patients with CM are particularly vulnerable to AF, the mainstays of AF management in CM remain the same as in the general population, with the “three pillars” being risk factor optimization, stroke prevention, and symptom management [1]. Ideally, as advocated by the authors, each pillar would feature a phenotype-specific approach to effectively address those at greatest risk. The authors outline several instances for which there has been success in tailored AF management for those with CM. First and foremost, this includes improved optimization of the under-

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lying substrate (i.e., the CM). This domain has been bolstered recently by advances spanning the more general, such as expanded guideline-directed medical and device therapies for patients with HF across the ejection fraction spectrum, which have robust evidence in decreasing AF incidence [13], to more targeted therapies such as the medication tafamadis for transthyretin amyloid CM, which emerging evidence suggests may lower AF incidence [14]. Secondly, in the domain of stroke prevention, there is wide recognition that the CHA₂DS₂-VASc score is not sufficient to predict stroke risk in patients with HCM or CA and thus, anticoagulation is recommended in all HCM and CA patients with comorbid AF regardless of CHA₂DS₂-VASc score [1,15]. Lastly, in the ongoing evaluation of routine screening for asymptomatic AF, HCM patients with high risk for developing AF stand out as a rare population for which annual screening with ambulatory monitoring is recommended by guidelines (Class 1 recommendation in the 2024 AHA/ACC/AMSSM/HRS/PACES/SCMR HCM guidelines) [16].

Although these instances of tailored AF management offer improved care for patients with CM, there remain many limitations and unmet needs. One of the fundamental needs and pervasive limitations of existing literature is the production of quality data when presented with heterogenous CM phenotypes. In interpreting the available data when caring for individual patients with CM and AF, we consistently ask: Was my patient reflected in the studied population? Will they be subject to the same risk and benefit? On the other hand, efforts to create more specific and individualized recommendations, for example guided by genotype as mentioned by the authors, are naturally limited by smaller eligible study populations and the imprudence of overgeneralization. This push-and-pull is illustrated in the progress that has been made in stroke prevention for the select highest-risk populations of HCM and CA, though there are many more with CM who likely have true risk beyond that portended by the “H” in the CHA₂DS₂-VASC score alone.

Perhaps the greatest outstanding need for patients with CM is improved therapy for symptom management and prevention of adverse outcomes related to AF. Despite their heightened risk of poor quality of life or adverse health outcomes related to AF, CM patients are faced with a limited selection of therapies for rate and rhythm control. In the setting of structural heart disease, rate control and antiarrhythmic drugs are often contraindicated or poorly tolerated. Fortunately, catheter ablation has emerged as a safe and effective option for some of those with CM and HF [17]. In the 2023 ACC/AHA/ACCP/HRS AF Guidelines, catheter ablation for the treatment of symptomatic AF is supported with a Class 1 recommendation in patients with HF with reduced ejection fraction, and a Class 2a recommendation for those with HF with preserved ejection fraction [1]. However, based on the trials from which these recommendations were derived [18,19], it should be noted that these guidelines are intended to apply to those who are deemed likely to benefit from catheter ablation, including those with earlier-stage HF and paroxysmal AF. A future direction is the exploration of catheter ablation in those with more advanced stages of CM/HF or CA, who are historically less likely to be offered ablation given concern for lower efficacy and greater risk of periprocedural complications. In this respect, we have already seen intrepid efforts in the sickest of CM patients with a recent small, single-center trial demonstrating that catheter ablation in those with end-stage HF may be a safe option to delay the need for heart transplantation or mechanical circulatory support [20]. This study, while challenging to generalize, including concerns about how well the studied population truly reflects Stage D HF [21], represents the type of innovative effort that will be required to move the needle for the most vulnerable CM patients.

In summary, Antonopoulos et al. have produced a valuable contemporary review regarding the relationship between AF and the

various forms of CM, while elucidating emerging needs in this setting. Patients with cardiomyopathy form a heterogenous population with a shared but variable vulnerability to AF. Tailoring care to the individual patient's underlying subtype of CM and stage of disease is the standard of care, but this still leaves many with limited therapeutic options. Further high-quality research on those with specific CM phenotypes is needed to move toward the individualized and phenotype-specific approach to AF care envisioned by the authors.

Disclosures

The authors report no relevant disclosures.

CRediT authorship contribution statement

James W. Salazar: Conceptualization, Writing – original draft, Writing – review & editing. **Daniel P. Morin:** Conceptualization, Project administration, Supervision, Writing – review & editing.

References

- [1] Joglar JA, Chung MK, Armbruster AL, Benjamin EJ, Chyou JY, Cronin EM, et al. 2023 ACC/AHA/ACCP/HRS guideline for the diagnosis and management of atrial fibrillation: a report of the American college of cardiology/American heart association joint committee on clinical practice guidelines. *Circulation* 2024;149:e1–e156.
- [2] Dieleman JL, Cao J, Chapin A, Chen C, Li Z, Liu A, et al. US health care spending by payer and health condition, 1996–2016. *JAMA* 2020;323:863–84.
- [3] Rogers PA, Bernard ML, Madias C, Thihalolipavan S, Mark Estes NA, Morin DP. Current evidence-based understanding of the epidemiology, prevention, and treatment of atrial fibrillation. *Curr Probl Cardiol* 2018;43:241–83.
- [4] Antonopoulos A, Kasiakogias A, Kouroutzoglou A, Touloupaki M, Briasoulis A, Papatheodorou E, et al. Atrial fibrillation burden and management in cardiomyopathies: current evidence and unmet needs. *Trends Cardiovasc. Med.* 2025;3601–9.
- [5] Mizia-Stec K, Caforio ALP, Charron P, Gimeno JR, Elliott P, Kaski JP, et al. Atrial fibrillation, anticoagulation management and risk of stroke in the Cardiomyopathy/Myocarditis registry of the EURObservational Research Programme of the European Society of Cardiology. *ESC Heart Fail* 2020;7:3601–9.
- [6] Charron P, Elliott PM, Gimeno JR, Caforio ALP, Kaski JP, Tavazzi L, et al. EORP cardiomyopathy registry investigators. the cardiomyopathy registry of the eurobservational research programme of the european society of cardiology: baseline data and contemporary management of adult patients with cardiomyopathies. *Eur. Heart J.* 2018;39:1784–93.
- [7] Linz D., Gawalko M., Betz K., Hendriks J.M., Lip G.Y.H., Vinter N., Guo Y., Johnsen S. Atrial fibrillation: epidemiology, screening and digital health. *The Lancet Regional Health – Europe* [Internet]. 2024 [cited 2025 Feb 12];37. Available from: [https://www.thelancet.com/journals/lanep/article/PIIS2666-7762\(23\)00205-3/fulltext](https://www.thelancet.com/journals/lanep/article/PIIS2666-7762(23)00205-3/fulltext)
- [8] Ceonodolea AD, Bal R, Severens JL. Epidemiology and management of atrial Fibrillation and Stroke: review of data from four European countries. *Stroke Res Treat* 2017;2017:8593207.
- [9] Noubiap JJ, Tang JJ, Teraoka JT, Dewland TA, Marcus GM. Minimum national prevalence of diagnosed atrial fibrillation inferred from California Acute Care facilities. *J Am Coll Cardiol* 2024;84:1501–8.
- [10] Buckley BJR, Harrison SL, Gupta D, Fazio-Eynullayeva E, Underhill P, Lip GYH. Atrial fibrillation in patients with cardiomyopathy: prevalence and clinical outcomes from real-world data. *J Am Heart Assoc* 2021;10:e021970.
- [11] Witteles R, Jefferies JL, Kapa S, Cappelli F, Sultan MB, Gundapaneni B, et al. Atrial fibrillation as a prognostic factor for all-cause mortality in patients with transthyretin amyloid cardiomyopathy. *JACC CardioOncol* 2024;6:592–8.
- [12] Mazzanti A, Ng K, Faragli A, Maragna R, Chiodaroli E, Orphanou N, et al. Arrhythmogenic right Ventricular cardiomyopathy: clinical course and predictors of arrhythmic risk. *J Am Coll Cardiol* 2016;68:2540–50.
- [13] Newman JD, 'Meara Eileen O, B öhm M, Savarese G, Kelly PR, Vardeny O, et al. Implications of atrial fibrillation for guideline-directed therapy in patients with heart failure. *J Am Coll Cardiol* 2024;83:932–50.
- [14] Girvin ZP, Sweat AO, Kochav SM, Maurer MS, Dizon J, Wan EY, et al. Tafamidis and incidence of atrial fibrillation in transthyretin amyloid cardiomyopathy. *JACC: Clinic. Electrophysiol* 2023;9:586–7.
- [15] Heidenreich PA, Bozkurt B, Aguilar D, Allen LA, Byun JJ, Colvin MM, et al. 2022 AHA/ACC/HFSA guideline for the management of heart failure. *J Am Coll Cardiol* 2022;79:e263–421.
- [16] Ommen SR, Ho CY, Asif IM, Balaji S, Burke MA, Day SM, et al. 2024 AHA/ACC/AMSSM/HRS/PACES/SCMR Guideline for the management of Hypertrophic Cardiomyopathy: a report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines. *Circulation* 2024;149:e1239–311.

- [17] Bernard ML, Benn F, Williams CM, Hiltbold AE, Rogers PA, Polin GM, et al. The role of atrial fibrillation catheter ablation in patients with heart failure. *Prog Cardiovasc Dis* 2021;66:80–5.
- [18] Marrouche NF, Brachmann J, Andresen D, Siebels J, Boersma L, Jordaens L, et al. Catheter ablation for atrial fibrillation with heart failure. *New England J. Med* 2018;378:417–27.
- [19] Rillig A, Magnussen C, Ozga A-K, Suling A, Brandes A, Breithardt G, et al. Early rhythm control therapy in patients with atrial fibrillation and heart failure. *Circulation* 2021;144:845–58.
- [20] Sohns C, Fox H, Marrouche NF, Crijns HJGM, Costard-Jaeckle A, Bergau L. Catheter ablation in end-stage heart failure with atrial fibrillation. *New England J. Med* 2023;389:1380–9.
- [21] Lewis EF. Catheter ablation for atrial fibrillation in heart failure — An option to defer transplantation? *New England J. Med* 2023;389:1429–30.