



## OPEN ACCESS

EDITED AND REVIEWED BY  
Eliot Ohlstein,  
Drexel University, United States

\*CORRESPONDENCE  
S. Romano,  
✉ silvio.romano@univaq.it

RECEIVED 16 July 2024  
ACCEPTED 18 July 2024  
PUBLISHED 25 July 2024

CITATION  
Sciarra L, Romano S, Paparella G and Scarà A  
(2024), Editorial: Pharmacological therapy in  
patients with arrhythmias.  
*Front. Pharmacol.* 15:1465539.  
doi: 10.3389/fphar.2024.1465539

COPYRIGHT  
© 2024 Sciarra, Romano, Paparella and Scarà.  
This is an open-access article distributed under  
the terms of the [Creative Commons Attribution  
License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use, distribution or  
reproduction in other forums is permitted,  
provided the original author(s) and the  
copyright owner(s) are credited and that the  
original publication in this journal is cited, in  
accordance with accepted academic practice.  
No use, distribution or reproduction is  
permitted which does not comply with these  
terms.

# Editorial: Pharmacological therapy in patients with arrhythmias

L. Sciarra<sup>1</sup>, S. Romano<sup>1\*</sup>, G. Paparella<sup>2</sup> and A. Scarà<sup>1,3</sup>

<sup>1</sup>Cardiovascular Disease Department, University of Study L'Aquila, L'Aquila, Italy, <sup>2</sup>Clinique de L'Europe, Uccle, Belgium, <sup>3</sup>San Carlo di Nancy-GVM Hospital, Rome, Italy

## KEYWORDS

arrhythmias, pharmacological treatment, atrial fibrillation, DOAC, direct-acting oral anticoagulant, ischaemic stroke

## Editorial on the Research Topic Pharmacological therapy in patients with arrhythmias

Cardiac arrhythmias represent one of the most worldwide health problems. The incidence and prevalence of the different forms of arrhythmia can be significantly different in relation to age group and gender (Brugada et al., 2020): for example, the supraventricular tachycardia (SVT) prevalence is 2.25/1,000 persons and the incidence is 35/100,000 person-years. Women have a risk of developing SVT that is two times greater than men, and people aged >65 years or have more than five times the risk of developing SVT than younger individuals. On the other hand, WPW syndrome can be more frequently diagnosed in paediatric and young adult populations (Orejarena et al., 1998).

Atrial fibrillation is the most frequent cardiac sustained arrhythmia. The currently estimated prevalence of AF in adults is between 2% and 4% (Benjamin et al., 2019) and a 2.3 fold rise is expected (Colilla et al., 2013; Krijthe et al., 2013; Chugh et al., 2014). Increasing age is a prominent AF risk factor. Moreover, increasing burden of other comorbidities (hypertension, diabetes mellitus, heart failure, coronary artery disease, obesity and obstructive sleep apnoea) can play a crucial role (Cadby et al., 2015; Hobbelt et al., 2017; Aune et al., 2018; Grieco et al., 2018). AF is associated with substantial morbidity and mortality: in fact, AF can be recognized as cause of 20%–30% of all ischaemic strokes (and 10% of cryptogenic ones), can lead to left ventricular dysfunction and heart failure, consistently impairing quality of life patients and in some cases increasing incidence of death (1.5–3.5 fold rise) (Brugada et al., 2020).

For these reasons, early detection of AF represents an important goal; for this purpose, different tools of ECG monitoring (prolonged Holter ECG records, external loop recorder, event recorder, implantable devices) can be useful (de Ruvo et al., 2016; Sciarra et al., 2022).

In addition, maintenance of sinus rhythm can lead to better clinical outcomes, in patients suffering from AF: quality of life improves in symptomatic patients and cardiac mortality appears reduced in the setting of heart failure (Crawford et al., 2024). To achieve this objective, the most powerful weapon available seems to be catheter ablation. However, despite the different kind of energy useable and the enormous amount of techniques developed to treat this arrhythmia, ablation procedure appears far from to be considered a definitive solution (Sciarra et al., 2014; Scarà et al., 2018; Sciarra et al., 2018; Rebecchi et al., 2021; Sciarra and Scarà, 2023), even if a tailored approach can allow increasing efficacy, minimizing procedural risks (Palamà et al., 2022; Palamà et al., 2023).

Additional pharmacological therapy, to maintain sinus rhythm after cardiac ablation, can be a helpful tool as suggested by Fei et al. in this Research Topic: they presented a retrospective observational study that encompassed 420 elderly patients with AF following ablation procedure. Predictors of early recurrences were identified in left atrial size, left ventricular dimensions and some humoral biomarkers; in this setting, compared to amiodarone, propafenone and sotalol exhibited an elevated risk of early recurrence.

Prevention of ischaemic stroke is another crucial point in patients affected by AF. This Research Topic is extensively covered in this Research Topic: Yin et al. have drawn up a vademecum of 17 recommendations on the use of fondaparinux in numerous settings, including that concerning the treatment of patients after a cardioversion for atrial fibrillation. An important part of this Research Topic is dedicated to direct-acting oral anticoagulants (DOACs), suggesting, in some cases, particular usage: Pan et al., for example, explored the feasibility and safety of twice daily rivaroxaban as a postoperative anticoagulation regimen for patients with AF undergoing left atrial appendage closure (LAAC). They found that a short course of twice-daily rivaroxaban following LAAC is a feasible alternative regimen with a low rate of major bleeding events, and device-related thrombosis (DRT), thromboembolic events for patients with AF.

Furthermore, usage of DOACs, could open new scenarios for the management of anticoagulation in sports players affected by AF. Minardi et al., for example, suggested that the pharmacological profile of DOACs could offer theoretical solutions for overcoming the increased risk of bleeding in sports patients: drugs with lower half-lives could allow sports at risk of trauma within the “therapeutic window,” when the estimated blood concentration of the drug is minimal.

Finally, present Research Topic underline the importance of a rigorous management of anticoagulation therapy to reduce the incidence of haemorrhagic events in AF patients: Zhang et al. showed the beneficial effects of a national centralized drug

procurement policy on anticoagulation selection in terms of medical adherence and reduction of adverse events.

## Author contributions

LS: Conceptualization, Methodology, Supervision, Writing–review and editing. SR: Conceptualization, Methodology, Visualization, Writing–review and editing. GP: Conceptualization, Visualization, Writing–review and editing. AS: Conceptualization, Data curation, Methodology, Project administration, Writing–original draft, Writing–review and editing.

## Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

## References

- Aune, D., Feng, T., Schlesinger, S., Janszky, I., Norat, T., and Riboli, E. (2018). Diabetes mellitus, blood glucose and the risk of atrial fibrillation: a systematic review and metaanalysis of cohort studies. *J. Diabetes Complicat.* 32, 501–511. doi:10.1016/j.jdiacomp.2018.02.004
- Benjamin, E. J., Muntner, P., Alonso, A., Bittencourt, M. S., Callaway, C. W., Carson, A. P., et al. (2019). Heart disease and stroke statistics 2019 update: a report from the American Heart Association. *Circulation* 139, e56–e528. doi:10.1161/CIR.0000000000000659
- Brugada, J., Katritsis, D. G., Arbelo, E., Arribas, F., Bax, J. J., Blomström-Lundqvist, C., et al. (2020). 2019 ESC Guidelines for the management of patients with supraventricular tachycardia: The Task Force for the management of patients with supraventricular tachycardia of the European Society of Cardiology (ESC). *Eur. Heart J.* 41 (5), 655–720. doi:10.1093/eurheartj/ehz467
- Cadby, G., McArdle, N., Briffa, T., Hillman, D. R., Simpson, L., Knuiman, M., et al. (2015). Severity of OSA is an independent predictor of incident atrial fibrillation hospitalization in a large sleep-clinic cohort. *Chest* 148, 945–952. doi:10.1378/chest.15-0229
- Chugh, S. S., Havmoeller, R., Narayanan, K., Singh, D., Rienstra, M., Benjamin, E. J., et al. (2014). Worldwide epidemiology of atrial fibrillation: a global burden of disease 2010 study. *Circulation* 129, 837–847. doi:10.1161/CIRCULATIONAHA.113.005119
- Colilla, S., Crow, A., Petkun, W., Singer, D. E., Simon, T., and Liu, X. (2013). Estimates of current and future incidence and prevalence of atrial fibrillation in the US adult population. *Am. J. Cardiol.* 112, 1142–1147. doi:10.1016/j.amjcard.2013.05.063
- Crawford, M., Steinberg, B. A., Ranjan, R., Konstantinidis, K., Navaravong, L., and Bunch, T. J. (2024). Mortality benefit with AF ablation: impact of normal sinus rhythm seen in CABANA and EAST AFnet. *J. Cardiovasc Electrophysiol.* 35 (3), 538–546. Epub 2023 Dec 22. PMID: 38131368. doi:10.1111/jce.16160
- de Ruvo, E., Sciarra, L., Martino, A. M., Rebecchi, M., Iulianella, R. V., Sebastiani, F., et al. (2016). A prospective comparison of remote monitoring systems in implantable cardiac defibrillators: potential effects of frequency of transmissions. *J. Interv. Card. Electrophysiol.* 45 (1), 81–90. PMID: 26467152. doi:10.1007/s10840-015-0067-4
- Grieco, D., Palamà, Z., Borrelli, A., De Ruvo, E., Sciarra, L., Scarà, A., et al. (2018). Diabetes mellitus and atrial remodelling in patients with paroxysmal atrial fibrillation: role of electroanatomical mapping and catheter ablation. *Diab Vasc. Dis. Res.* 15 (3), 185–195. Epub 2018 Jan 16. PMID: 29338326. doi:10.1177/1479164117752492
- Hobbelt, A. H., Siland, J. E., Geelhoed, B., Van Der Harst, P., Hillege, H. L., Van Gelder, I. C., et al. (2017). Clinical, biomarker, and genetic predictors of specific types of atrial fibrillation in a community-based cohort: data of the PREVEND study. *Europace* 19, 226–232. doi:10.1093/eurpace/euw016
- Krijthe, B. P., Kunst, A., Benjamin, E. J., Lip, G. Y., Franco, O. H., Hofman, A., et al. (2013). Projections on the number of individuals with atrial fibrillation in the European Union, from 2000 to 2060. *Eur. Heart J.* 34, 2746–2751. doi:10.1093/eurheartj/ehz280
- Orejarena, L. A., Vidaillet, H., DeStefano, F., Nordstrom, D. L., Vierkant, R. A., Smith, P. N., et al. (1998). Paroxysmal supraventricular tachycardia in the general population. *J. Am. Coll. Cardiol.* 31, 150–157. doi:10.1016/s0735-1097(97)00422-1
- Palamà, Z., Nesti, M., Robles, A. G., Scarà, A., Romano, S., Cavarretta, E., et al. (2022). Tailoring the ablative strategy for atrial fibrillation: a state-of-the-art review. *Cardiol. Res. Pract.* 28, 9295326. PMID: 35449606; PMCID: PMC9017557. doi:10.1155/2022/9295326

- Palamà, Z., Robles, A. G., Paoletti, M., Nesti, M., De Ruvo, E., Scarà, A., et al. (2023). Long-term follow-up in paroxysmal atrial fibrillation patients with documented isolated trigger. *Front. Cardiovasc Med.* 10, 1115328. PMID: 37529713; PMCID: PMC10390222. doi:10.3389/fcvm.2023.1115328
- Rebecchi, M., Panattoni, G., Edoardo, B., de Ruvo, E., Sciarrà, L., Politano, A., et al. (2021). Atrial fibrillation and autonomic nervous system: a translational approach to guide therapeutic goals. *J. Arrhythm.* 37 (2), 320–330. PMID: 33850573; PMCID: PMC8022002. doi:10.1002/joa3.12512
- Scarà, A., Sciarrà, L., De Ruvo, E., Borrelli, A., Grieco, D., Palamà, Z., et al. (2018). Safety and feasibility of atrial fibrillation ablation using Amigo<sup>®</sup> system versus manual approach: a pilot study. *Indian Pacing Electrophysiol. J.* 18 (2), 61–67. Epub 2017 Nov 1. PMID: 29102650; PMCID: PMC5998200. doi:10.1016/j.ipej.2017.10.001
- Sciarrà, L., Cavarretta, E., Siciliani, S., Sette, A., Scarà, A., Grieco, D., et al. (2022). Managing athletes with palpitations of unknown origin with an external loop recorder: a cohort study. *J. Sports Med. Phys. Fit.* 62 (4), 554–559. Epub 2021 Sep 9. PMID: 34498825. doi:10.23736/S0022-4707.21.12831-2
- Sciarrà, L., Golia, P., Natalizia, A., De Ruvo, E., Dottori, S., Scarà, A., et al. (2014). Which is the best catheter to perform atrial fibrillation ablation? A comparison between standard ThermoCool, SmartTouch, and Surround Flow catheters. *J. Interv. Card. Electrophysiol.* 39 (3), 193–200. Epub 2014 Feb 21. PMID: 24557861. doi:10.1007/s10840-014-9874-2
- Sciarrà, L., Iacopino, S., Palamà, Z., De Ruvo, E., Filannino, P., Borrelli, A., et al. (2018). Impact of the third generation cryoballoon on atrial fibrillation ablation: an useful tool? *Indian Pacing Electrophysiol. J.* 18 (4), 127–132. Epub 2018 Feb 22. PMID: 29476904; PMCID: PMC6090001. doi:10.1016/j.ipej.2018.02.003
- Sciarrà, L., and Scarà, A. (2023). Will the blooming of artificial intelligence modify our approach to atrial fibrillation cure? *J. Cardiovasc Electrophysiol.* 34 (5), 1175–1176. Epub 2023 Apr 13. PMID: 37051856. doi:10.1111/jce.15907