



# POLISH HEART JOURNAL

Kardiologia Polska  
The Official Peer-reviewed Journal  
of the Polish Cardiac Society  
since 1957

**Online first**

This is a provisional PDF only. Copyedited and fully  
formatted version will be made available soon

ISSN 0022-9032

e-ISSN 1897-4279

## **Preoperative atrial fibrillation in patients undergoing cardiac surgery: Gender versus other factors. Authors' reply**

**Authors:** Anna Kurasz, Emil J Dąbrowski, Mariusz Kowalewski, Łukasz Kuźma

**Article type:** Letter to the Editor

**Received:** July 1, 2024

**Accepted:** July 1, 2024

**Early publication date:** July 2, 2024

This article is available in open access under Creative Common Attribution-Non-Commercial-No Derivatives 4.0 International (CC BY-NC-ND 4.0) license, allowing to download articles and share them with others as long as they credit the authors and the publisher, but without permission to change them in any way or use them commercially.

## **Preoperative atrial fibrillation in patients undergoing cardiac surgery: Gender versus other factors. Authors' reply**

Anna Kurasz<sup>1</sup>, Emil J Dąbrowski<sup>1</sup>, Mariusz Kowalewski<sup>2-4</sup>, Łukasz Kuźma<sup>1</sup>

<sup>1</sup>Department of Invasive Cardiology, Medical University of Białystok, Białystok, Poland

<sup>2</sup>Department of Cardiac Surgery and Transplantology, National Medical Institute of the Ministry of Interior and Administration, Warszawa, Poland

<sup>3</sup>Thoracic Research Centre, Collegium Medicum Nicolaus Copernicus University, Innovative Medical Forum, Bydgoszcz, Poland

<sup>4</sup>Cardio-Thoracic Surgery Department, Heart and Vascular Centre, Maastricht University Medical Centre (MUMC), Cardiovascular Research Centre Maastricht (CARIM), Maastricht, the Netherlands

### **Correspondence to:**

Mariusz Kowalewski MD, PhD,

Clinical Department of Cardiac Surgery and Transplantology,

National Medical Institute of the Ministry of Interior and Administration,

Wołoska 137, 02-507 Warszawa, Poland,

phone: +48 502 269 249,

e-mail: kowalewskimariusz@gazeta.pl

We truly appreciate the comment on our recent publication investigating sex differences in long-term survival following cardiac surgery in patients with pre-operative atrial fibrillation (AF) [1] by Drs Engin and Yavuz [2].

Agreeably, the duration of pre-operative AF and type of performed cardiac surgery might affect prognosis. Indeed, however, one of the previously listed limitations of KROK Registry is lack of data on exact type of AF and detailed information on the conversion to sinus rhythm during follow-up [3].

Worth noting are numerically higher rates of surgical ablation (SA) in women (15.2% vs. 13.3%;  $P = 0.056$ ) in our cohort and the fact that evidence regarding sex-related differences in patients undergoing SA is limited. Shah et al. [4] found that women undergoing surgical correction of AF are older and more frequently suffer from heart failure, however there are no differences in survival after adjustments. According to the previous research investigating disparities between men and women undergoing catheter ablation, the findings support the notion that women undergoing ablation are older, are more likely to have paroxysmal AF and are at the higher risk of peri-procedural complications and recurrence of arrhythmia with no differences in all-cause mortality [5, 6].

In order to investigate this topic thoroughly in the registry, we have now conducted further analyses focusing on patients undergoing SA ( $n = 696$ ; 41% undergoing concomitant coronary artery bypass grafting). Visual inspection shows worse prognosis in women, which is limited only to the first year after the procedure with curves crossover and no significant differences in survival during the overall follow-up time (log-rank  $P = 0.1$ ). In Cox proportional hazard regression, there were no significant differences during: 90-day follow up (hazard ratio [HR] 1.48; 95% confidence interval [CI], 0.78–2.8;  $P = 0.23$ ), 1 year (HR 0.92; 95% CI, 0.58–1.48;  $P = 0.74$ ), 2 year (HR 0.81; 95% CI, 0.53–1.26;  $P = 0.36$ ). Our results indicate that SA might influence differences between men and women in long-term survival. However, due to the relatively small analyzed group, the findings should be considered only hypothesis-generating and guide further research so it includes subgroup investigations, especially based on the pre-operative AF type and post-procedural conversion to sinus rhythm.

Potential sources of disparities in survival between men and women is most certainly multifactorial. Firstly, men had significantly higher rates of most major co-morbidities and more frequently were referred for urgent procedures. The higher rates of urgent surgeries might have influenced lower rates of both SA and left atrial appendage occlusion in men as these procedures often require prolongation of cardio-pulmonary bypass time. Of note, we have noticed a remarkable increase in the rates of left atrial appendage occlusion reported in KROK registry during the observation, reaching 22.9% in the last included year. In our study women had higher rates of post-operative complications, which was also reported before and may be related to the anatomical and hormonal differences and subsequently result in impaired short-term survival. Women may also benefit from better healthcare professionals' advice compliance, adaptation to

long-term lifestyle modifications and disease control strategies such as rehabilitation, mitigation of risk factors and secondary prevention, which may be reflected in curves crossover 2 years after the index procedure. Finally, the impact of exposome should not be underappreciated as it was shown that influence of environmental factors differs between men and women [7].

## Article information

**Conflict of interest:** None declared.

**Funding:** None.

**Open access:** This article is available in open access under Creative Common Attribution-Non-Commercial-No Derivatives 4.0 International (CC BY-NC-ND 4.0) license, which allows downloading and sharing articles with others as long as they credit the authors and the publisher, but without permission to change them in any way or use them commercially. For commercial use, please contact the journal office at [polishheartjournal@ptkardio.pl](mailto:polishheartjournal@ptkardio.pl)

## REFERENCES

1. Kuźma Ł, Kowalewski M, Gostomczyk K, et al. Sex differences in long-term survival following cardiac surgery in patients with underlying atrial fibrillation. *Pol Heart J*. 2024, doi: [10.33963/v.phj.100976](https://doi.org/10.33963/v.phj.100976), indexed in Pubmed: [38845430](https://pubmed.ncbi.nlm.nih.gov/38845430/).
2. Engin M, Yavuz S. Preoperative atrial fibrillation in patients undergoing cardiac surgery: Gender versus other factors. *Pol Heart J*. 2024, doi: [10.33963/v.phj.101227](https://doi.org/10.33963/v.phj.101227).
3. Kowalewski M, Dąbrowski EJ, Kuźma Ł, et al. Tricuspid intervention for less-than-severe regurgitation simultaneously with minimally invasive mitral valve surgery in patients with atrial fibrillation. *Kardiol Pol*. 2023; 81(10): 990–997, doi: [10.33963/KP.a2023.0137](https://doi.org/10.33963/KP.a2023.0137), indexed in Pubmed: [37366255](https://pubmed.ncbi.nlm.nih.gov/37366255/).
4. Shah SV, Kruse J, Andrei AC, et al. Gender differences in outcomes after surgical ablation of atrial fibrillation. *J Thorac Cardiovasc Surg*. 2016; 151(2): 391–398.e2, doi: [10.1016/j.jtcvs.2015.09.062](https://doi.org/10.1016/j.jtcvs.2015.09.062), indexed in Pubmed: [26507404](https://pubmed.ncbi.nlm.nih.gov/26507404/).
5. Yunus FN, Perino AC, Holmes DN, et al. Sex differences in ablation strategy, lesion sets, and complications of catheter ablation for atrial fibrillation: An analysis from the GWTG-AFIB registry. *Circ Arrhythm Electrophysiol*. 2021; 14(11): e009790, doi: [10.1161/CIRCEP.121.009790](https://doi.org/10.1161/CIRCEP.121.009790), indexed in Pubmed: [34719235](https://pubmed.ncbi.nlm.nih.gov/34719235/).

6. Cheng X, Hu Q, Gao L, et al. Sex-related differences in catheter ablation of atrial fibrillation: a systematic review and meta-analysis. *Europace*. 2019; 21(10): 1509–1518, doi: [10.1093/europace/euz179](https://doi.org/10.1093/europace/euz179), indexed in Pubmed: [31281922](https://pubmed.ncbi.nlm.nih.gov/31281922/).
7. Kuźma Ł, Dąbrowski EJ, Kurasz A, et al. Effect of air pollution exposure on risk of acute coronary syndromes in Poland: A nationwide population-based study (EP-PARTICLES study). *Lancet Reg Health Eur*. 2024; 41: 100910, doi: [10.1016/j.lanep.2024.100910](https://doi.org/10.1016/j.lanep.2024.100910), indexed in Pubmed: [38665621](https://pubmed.ncbi.nlm.nih.gov/38665621/).