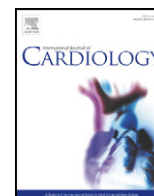


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New-onset atrial fibrillation and increased mortality after transcatheter aortic valve implantation: A causal or spurious association?



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Dear Editor,

Newly-onset atrial fibrillation (NOAF) has emerged in the last few years as a potential prognostic factor in patients undergoing transcatheter aortic valve implantation (TAVI). NOAF after TAVI could be detrimental due to atrio-ventricular dissynchrony resulting in reduced cardiac output and increased filling pressures. In addition, NOAF could be responsible for fatal cerebrovascular events (CVE). In the last few years some studies explored the incidence and the prognostic impact of NOAF after TAVI [1–5], and recently new large series have added to our knowledge [6–8]. However, the incidence of NOAF varies significantly across registries (around 6–32%), with controversial findings on its prognostic significance, hence the rationale for a meta-analysis.

We searched MEDLINE, Scopus and Cochrane databases until September 20, 2015 using Internet-based engines, with no language restrictions using various keywords including “new-onset atrial fibrillation” or “NOAF” and “transcatheter aortic valve implantation” or “TAVI” or “TAVR”. The reference lists of relevant studies and reviews, editorials

and letters were searched. The analysis was restricted to studies reporting data on mortality and CVE after TAVI stratified by the occurrence of NOAF. The most updated or inclusive data for a given study were selected. All studies were observational and the highest-quality estimate available was picked for the overall meta-analysis, with the following ranking: adjusted with propensity score > adjusted with multivariable analysis > unadjusted. The number of events, participants, hazard ratios (HR) and confidence intervals (CI) for all-cause death and CVE at 30-day and 1-year were abstracted. The results of all studies were combined using a random-effects model to minimize heterogeneity among groups. Statistical heterogeneity was quantified with the I^2 test. Systematic bias was explored with funnel plots. A 2-tailed alpha of 5% was used for hypothesis testing. Statistical analysis was performed with Review Manager (Version 5.2 Copenhagen).

A total of 8 studies encompassing 4959 patients were included [1–8]. Overall, the mean incidence of NOAF was 10.1% (499 patients with NOAF and 4460 patients in sinus rhythm after TAVI). Patients with NOAF showed a borderline increase of 30-day and a significant increase in 1-year all-cause death compared with those in sinus rhythm (Fig. 1). Conversely, CVE were significantly increased at 30-day but non-significantly albeit numerically increased at 1-year follow-up in NOAF patients (Fig. 2). The main limitation of this meta-analysis is related to the differences in NOAF definition across the included studies. We excluded the study by Tchetché et al. [9] because most recent data from the FRANCE-2 registry were available [8].

In conclusion, this updated meta-analysis on the role of NOAF on outcomes after TAVI supports the understanding that NOAF is associated with clinical events after TAVI. Whether this is a causal or spurious association demands further research in this field.

Disclosures

None.

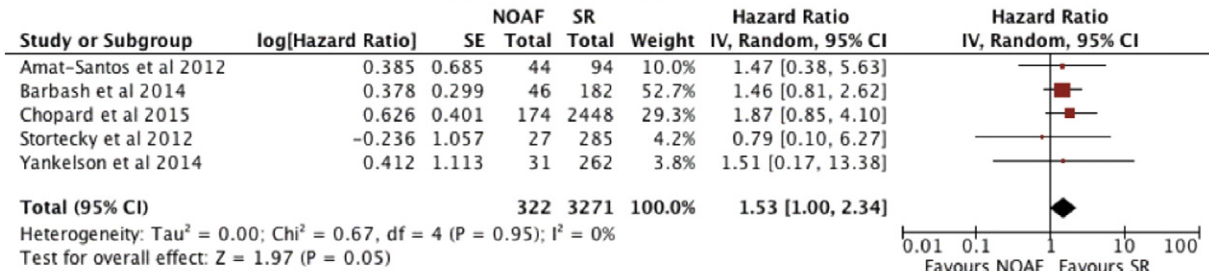
Conflict of interest

The authors report no relationships that could be construed as a conflict of interest.

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30-DAY ALL-CAUSE DEATH



1-YEAR ALL-CAUSE DEATH

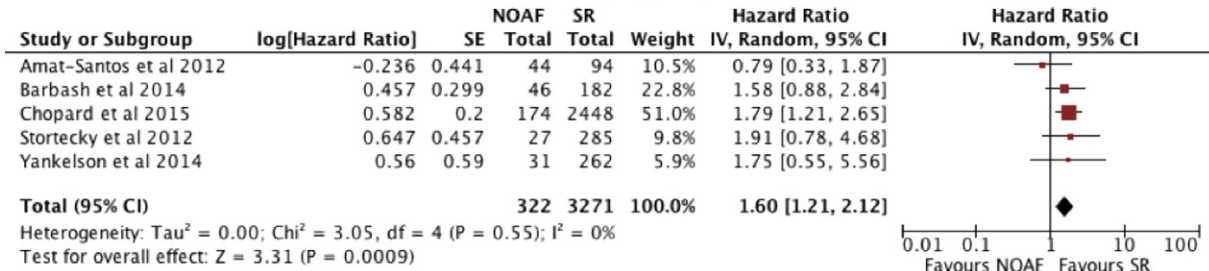
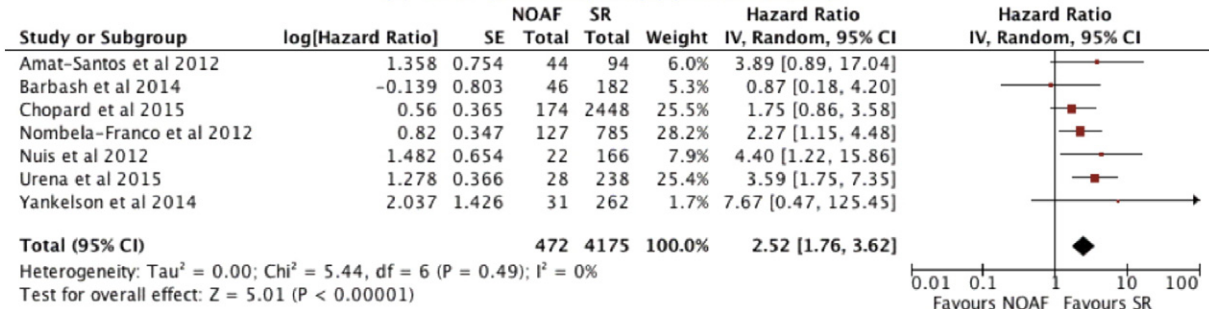


Fig. 1. Early and 1-year mortality after TAVI according to the occurrence of NOAF. Early and 1-year random-effects hazard ratios and 95% confidence interval for all-cause mortality after TAVI.

30-DAY CEREBROVASCULAR EVENTS



1-YEAR CEREBROVASCULAR EVENTS

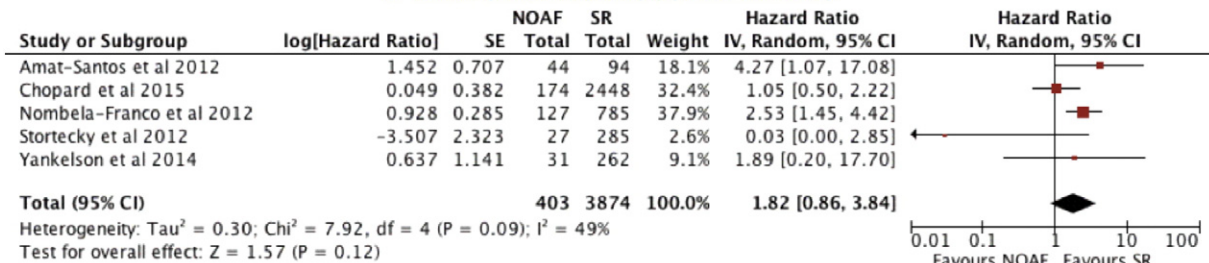


Fig. 2. Early and 1-year cerebrovascular events after TAVI according to the occurrence of NOAF. Early and 1-year random-effects hazard ratios and 95% confidence interval for cerebrovascular events after TAVI.

Acknowledgments

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References

1. J. Amat-Santos, J. Rodés-Cabau, M. Urena, et al., Incidence, predictive factors, and prognostic value of new-onset atrial fibrillation following transcatheter aortic valve implantation, *J. Am. Coll. Cardiol.* 59 (2) (2012) 178–188.
2. L. Nombela-Franco, J.G. Webb, P.P. de Jaegere, et al., Timing, predictive factors, and prognostic value of cerebrovascular events in a large cohort of patients undergoing transcatheter aortic valve implantation, *Circulation* 126 (2012) 3041–3053.
3. R.J. Nuis, N.M. Van Mieghem, C.J. Schultz, et al., Frequency and causes of stroke during or after transcatheter aortic valve implantation, *Am. J. Cardiol.* 109 (2012) 1637–1643.
4. S. Stortecky, L. Buellesfeld, P. Wenaweser, et al., Atrial fibrillation and aortic stenosis: impact on clinical outcomes among patients undergoing transcatheter aortic valve implantation, *Circ. Cardiovasc. Interv.* 6 (2014) 77–84.
5. L. Yankelson, A. Steinvil, L. Gershovitz, et al., Atrial fibrillation, stroke, and mortality rates after transcatheter aortic valve implantation, *Am. J. Cardiol.* 114 (12) (2014) 1861–1866.

- [6] M. Urena, S. Hayek, A.N. Cheema, et al., Arrhythmia burden in elderly patients with severe aortic stenosis as determined by continuous electrocardiographic recording: toward a better understanding of arrhythmic events after transcatheter aortic valve replacement, *Circulation* 131 (2015) 469–477.
- [7] I.M. Barbash, S. Minha, I. Ben-Dor, et al., Predictors and clinical implications of atrial fibrillation in patients with severe aortic stenosis undergoing transcatheter aortic valve implantation, *Catheter. Cardiovasc. Interv.* 85 (3) (2015) 468–477.
- [8] R. Chopard, E. Teiger, N. Meneveau, et al., Baseline characteristics and prognostic implications of pre-existing and new-onset atrial fibrillation after transcatheter aortic valve implantation: results from the FRANCE-2 registry, *J. Am. Coll. Cardiol. Interv.* 8 (10) (2015) 1346–1355.
- [9] D. Tchetché, B. Farah, L. Misuraca, et al., Cerebrovascular events post-transcatheter aortic valve replacement in a large cohort of patients: a FRANCE-2 registry substudy, *J. Am. Coll. Cardiol. Interv.* 7 (2014) 1138–1145.