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EDITORIAL

Antithrombotic strategies after TAVI in light of cerebral microembolism

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Transcatheter aortic valve implantation (TAVI) has transformed the treatment landscape of aortic stenosis. During the procedure, microembolisation of valve debris and foreign materials may occur, potentially resulting in subclinical cerebral abnormalities. Diffusion-weighted magnetic resonance imaging (DW-MRI) studies have shown new cerebral lesions in a significant proportion of TAVI patients[1]. Despite a substantial decline in overt stroke with newer-generation valves, cerebrovascular embolisation persists. Hence, the quest to mitigate post-TAVI stroke risk continues through cerebral embolic protection or antithrombotic strategies.

In this issue of EuroIntervention, Jimenez Diaz et al report on the results of the AUREA trial: a single-centre pilot study addressing an important gap by comparing dual antiplatelet therapy (DAPT) with oral anticoagulation (OAC) for reducing cerebral microembolism post-TAVI in patients without an indication for OAC. Patients were randomised to either DAPT or a vitamin K antagonist (VKA) for 3 months post-TAVI[2]. DW-MRI was performed at baseline and at 6 and 90 days after TAVI. Cerebral embolism was detected in over 75% of patients in both arms. While the number of lesions was similar, DAPT was associated with a significantly lower volume of embolic burden than VKA. Lastly, clinical outcomes did not differ between the two arms up to one year after TAVI.

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The AUREA trial reiterates the discussion on the clinical significance of silent brain infarcts (SBIs) and optimal antithrombotic strategies after TAVI. Consistent with prior studies, it shows high rates of post-TAVI subclinical cerebral infarcts that correlate with early, but not long-term, neurocognitive changes[3]. The prognostic impact of these procedural SBIs appears much lower than that of overt strokes, which are commonly associated with increased morbidity and mortality. Indeed, procedural SBIs are often isolated events, whereas strokes may recur and accumulate over time.

The present study challenges the traditional presumption that OAC is inherently more effective than antiplatelets in preventing cerebral embolisation. Indeed, the AUREA trial found no advantage of OAC over DAPT in preventing DW-MRI-detected cerebral lesions and revealed a greater lesion volume with VKA. These findings are not entirely unexpected from a pathophysiological perspective. Thrombus formation post-TAVI is complex and influenced by procedural factors, patient characteristics, and haemodynamic changes within the aortic root. Furthermore, the delayed onset and variability in VKA efficacy may limit protection during the critical periprocedural window; patients in the VKA arm were likely at subtherapeutic anticoagulation levels in their first week.

It is important to note that the regimens tested in the AUREA trial do not reflect current guideline recommendations; DAPT is not routinely used after TAVI, and non-VKAs are generally preferred over VKA[4]. Several recent trials on OAC post-TAVI failed to demonstrate a net clinical benefit of OAC, particularly in the prevention of thromboembolic events. The GALILEO trial, in post-TAVI patients without an indication for OAC, showed that low-dose rivaroxaban was associated with a higher risk of mortality and bleeding than an antiplatelet-based strategy, though it was more effective in preventing subclinical leaflet imaging abnormalities[5]. Concordant findings were reported in the ADAPT-TAVR and ATLANTIS trials[6,7].

To date, single antiplatelet therapy, commonly aspirin, remains the standard post-TAVI regimen for patients without an OAC indication, due to the absence of safer alternatives. However, this may not be a one-size-fits-all solution, as higher-risk patients may benefit from a more tailored approach. As the field matures, larger trials focusing on long-term neurocognitive outcomes with embolic protection devices or novel combination antithrombotic strategies will be pivotal in refining care for this growing patient population.

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Conflict of interest statement

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References

1. Van Belle E, Hengstenberg C, Lefevre T, Kupatt C, Debry N, Husser O, Pontana F, Kuchcinski G, Deliargyris EN, Mehran R, Bernstein D, Anthopoulos P, Dangas GD; BRAVO-3 MRI Study Investigators. Cerebral Embolism During Transcatheter Aortic Valve Replacement: The BRAVO-3 MRI Study. *J Am Coll Cardiol.* 2016;68:589-99.

2. Jimenez Diaz VA, Juan-Salvadores P, Bellas Lamas P, Arias Gonzalez M, Santos Armentia E, Vila Nieto O, Gonzalez Mao C, Torrado Chedas T, Muñoz Garcia AJ, Gomez Blazquez I, Bastos Fernandez G, De Miguel Castro A, Fernandez Barbeira S, Ortiz Saez A, Baz Alonso JA, Ocampo Miguez J, Rioboo Leston L, Pazos Lopez P, Calvo Iglesias F, Salgado Barreira A, Diaz Lopez CM, Figueiras A, Veiga Garcia C, Iñiguez Romo A. A comparison of antiplatelet and oral anticoagulation strategies to prevent cerebral microembolism after transcatheter aortic valve implantation: the AUREA trial. *EuroIntervention.* 2025;21:e737-48.

3. Woldendorp K, Indja B, Bannon PG, Fanning JP, Plunkett BT, Grieve SM. Silent brain infarcts and early cognitive outcomes after transcatheter aortic valve implantation: a systematic review and meta-analysis. *Eur Heart J.* 2021;42:1004-15.

4. Vahanian A, Beyersdorf F, Praz F, Milojevic M, Baldus S, Bauersachs J, Capodanno D, Conradi L, De Bonis M, De Paulis R, Delgado V, Freemantle N, Haugaa KH, Jeppsson A, Jüni P, Pierard L, Prendergast BD, Sádaba JR, Tribouilloy C, Wojakowski W. 2021 ESC/EACTS Guidelines for the management of valvular heart disease. *EuroIntervention.* 2022;17:e1126-96.

5. Dangas GD, Tijssen JGP, Wöhrle J, Søndergaard L, Gilard M, Möllmann H, Makkar RR, Herrmann HC, Giustino G, Baldus S, De Backer O, Guimarães AHC, Gullestad L, Kini A, von Lewinski D, Mack M, Moreno R, Schäfer U, Seeger J, Tchétché D, Thomitzek K, Valgimigli M, Vranckx P, Welsh RC, Wildgoose P, Volkl AA, Zazula A, van Amsterdam RGM, Mehran R, Windecker S; GALILEO Investigators. A Controlled Trial of Rivaroxaban after Transcatheter Aortic-Valve Replacement. *N Engl J Med.* 2020;382:120-9.

6. Park DW, Ahn JM, Kang DY, Kim KW, Koo HJ, Yang DH, Jung SC, Kim B, Wong YTA, Lam CCS, Yin WH, Wei J, Lee YT, Kao HL, Lin MS, Ko TY, Kim WJ, Kang SH, Yun SC, Lee SA, Ko E, Park H, Kim DH, Kang JW, Lee JH, Park SJ; ADAPT-TAVR Investigators. Edoxaban Versus Dual Antiplatelet Therapy for Leaflet Thrombosis and Cerebral Thromboembolism After TAVR: The ADAPT-TAVR Randomized Clinical Trial. *Circulation.* 2022;146:466-79.

7. Collet JP, Van Belle E, Thiele H, Berti S, Lhermusier T, Manigold T, Neumann FJ, Gilard M, Attias D, Beygui F, Cequier A, Alfonso F, Aubry P, Baronnet F, Ederhy S, Kasty ME, Kerneis M, Barthelemy O, Lefèvre T, Leprince P, Redheuil A, Henry P, Portal JJ, Vicaut E, Montalescot G; ATLANTIS Investigators of the ACTION Group. Apixaban vs. standard of care after transcatheter aortic valve implantation: the ATLANTIS trial. *Eur Heart J.* 2022;43:2783-97.