Antithrombotic Regimens in Patients Undergoing Transcatheter Aortic Valve Implantation

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Transcatheter aortic valve implantation (TAVI) has become a therapeutic option for patients with symptomatic severe aortic stenosis (AS) and clinically considered to be at high risk or inoperable for conventional surgical aortic valve replacement (AVR).1–3 TAVI has similar mortality rates but superior quality of life in comparison with surgical AVR; however, periprocedural thromboembolic complications and post-TAVI cerebrovascular events are clinically relevant, and antithrombotic treatment is therefore thought to play an important role in stroke prevention in the prothrombotic environment of the bioprosthesis.4 It is widely accepted to prescribe clopidogrel in addition to aspirin for a 3- to 6-month period after TAVI, but this approach is not evidence-based, and evidence is lacking about the antithrombotic regimens of single-antiplatelet (SAPT), dual-antiplatelet (DAPT), or warfarin in patients undergoing TAVI (Figure).

In this issue of the Journal, Ichibori et al6 report on the effect of DAPT vs. SAPT on clinical outcomes and valve function following TAVI. They analyzed 144 consecutive patients undergoing implantation of a balloon-expandable transcatheter valve (SAPIEN or SAPIEN XT, Edward Lifesciences), and the subjects were divided into 2 groups of DAPT (n=66) and SAPT (n=78). Their endpoint was a composite of all-cause death, myocardial infarction, stroke, major or life-threatening bleeding complications, and valve function assessed by echocardiography. Their results were as follows: 1-year follow-up after TAVI, the composite endpoint occurred significantly less frequently in the SAPT group (15.4%) than in the DAPT group (30.3%; P=0.031), and valve function was similar between the 2 groups with respect to effective orifice area and transvalvular pressure gradient. Importantly, there were higher rates of bleeding events in the DAPT group and there was no significant difference in the rates of other adverse events. The authors are to congratulated for reporting these striking results comparing the outcomes with DAPT or SAPT treatment in Japan.

Current Evidence for Antithrombotic Therapy Following TAVI

Earlier pathological study showed thrombus formation and...
fibrin aggregation on the valve within the first days after implantation. Current consensus-based international guidelines recommend from 1 to 6 months of DAPT following TAVI. The use of DAPT to reduce thrombogenic risk early after TAVI is similar to the antithrombotic strategy in the field of coronary intervention, but evidence directly comparing different antiplatelet regimens after TAVI is limited. Moreover, the different characteristics of bioprostheses compared with coronary stents decrease the likelihood of thrombosis or stenosis of TAVI valves, and the proportions of valve thrombosis and embolism are indeed low. In contrast, patients who undergo TAVI are generally older and have more comorbidities than those undergoing percutaneous coronary intervention, implying potentially greater risk of bleeding complications with routine use of DAPT.

There have been several studies investigating DAPT vs. SAPT antithrombotic treatment after TAVI, but they could not demonstrate significant reduction in major adverse cardiovascular or cerebrovascular events with DAPT compared with SAPT. On the other hand, those 4 studies identified a higher rate of bleeding complications with DAPT. Similarly, the present study by Ichihori et al also did not show significant benefit of adding clopidogrel to prevent major cardiovascular events, and although not reaching statistical significance after propensity score matching, it showed a strong tendency toward increased risk of bleeding complications with DAPT compared with SAPT treatment. This is consistent with the results from SAT-TAVI, a single-center randomized trial of 142 patients, showing a trend toward major and minor bleeding reductions with SAPT. Moreover, the results of the present study showed equal valve function between the SAPT and DAPT treatment groups.

Antithrombotic Therapy in the Future

The results of the current studies suggest that the increased incidence of thromboembolic events following TAVI may not be avoidable by simply strengthening the antithrombotic regimen. Mechanisms other than prostesis-induced prothrombotic environment might play a role in the pathogenesis of accelerated thrombogenesis. In contrast, strengthening antithrombotic treatment could have a detrimental effect on the outcome of the patients with TAVI, mainly by increasing the risk of bleeding complications.

To date, there has been limited evidence to validate the use of DAPT compared with SAPT after the TAVI procedure. Increasing attention is being paid to this controversy appropriately conducted randomized controlled trials would identify the appropriate antithrombotic treatment following TAVI, but we clinicians should evaluate the risk and benefit of DAPT treatment on a case-by-case basis at this moment.

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None.

References