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Benefit of Single Antiplatelet Therapy Over Dual Antiplatelet Therapy After Transcatheter Aortic Valve Implantation

Current practice guidelines recommend dual antiplatelet therapy (DAPT) with aspirin and clopidogrel for 3 to 6 months followed by lifelong aspirin after transcatheter aortic valve implantation (TAVI). However, recently published POPular TAVI trial[1] and other trials[2–4] that have compared DAPT with single antiplatelet therapy (SAPT) have shown decreased bleeding events and noninferiority with respect to ischemic stroke, all-cause mortality, and myocardial infarction (MI) among patients receiving SAPT. Using the existing randomized control trials (RCTs) evaluating the efficacy of DAPT versus SAPT in patients undergoing TAVI who did not have an indication for oral anticoagulation, we computed the net clinical benefit (NCB) of SAPT.

The 2 groups (DAPT and SAPT) were compared for the following outcomes: Major or life-threatening bleeding, stroke, all-cause mortality, and MI at the longest available follow-up. We used Mantel-Haenszel method with Paule-Mandel estimator for tau2, Hartung-Knapp adjustment for random effects model and Q-profile method for confidence interval of tau2 and tau to calculate risk ratio (RR) with 95% confidence interval (CI). Heterogeneity was assessed using Higgins I2 statistics. All statistical analysis was carried out using R version 3.6.4. NCB for SAPT was defined as stroke event prevented by SAPT minus major or life-threatening bleeding caused by SAPT multiplied by a weighting factor.[5] The weighting factor reflects the relative impact, with regard to death and disability, of major or life-threatening bleeding compared with stroke. In addition to a weighting factor of 1, sensitivity analyses by using weighting factors 0.5, 1.5, and 2 were also performed.

Net Clinical Benefit $_{SAPT}$ = *(Stroke rate* $_{DAPT}$ *- Stroke rate* $_{SAPT}$*) − Weight factor (Major or life-threatening bleeding* $_{SAPT}$ *- Major or life-threatening bleeding* $_{DAPT}$*)*

Four RCTs[1–4] were included in the final analysis. Together, these studies included 1086 patients: 541 with SAPT (aspirin only) and 545 patients with DAPT (aspirin and clopidogrel). The average duration of follow up was 5.5 months (range: 1 to 12 months). DAPT was associated with a significantly higher risk of major bleeding or life-threatening bleeding in comparison

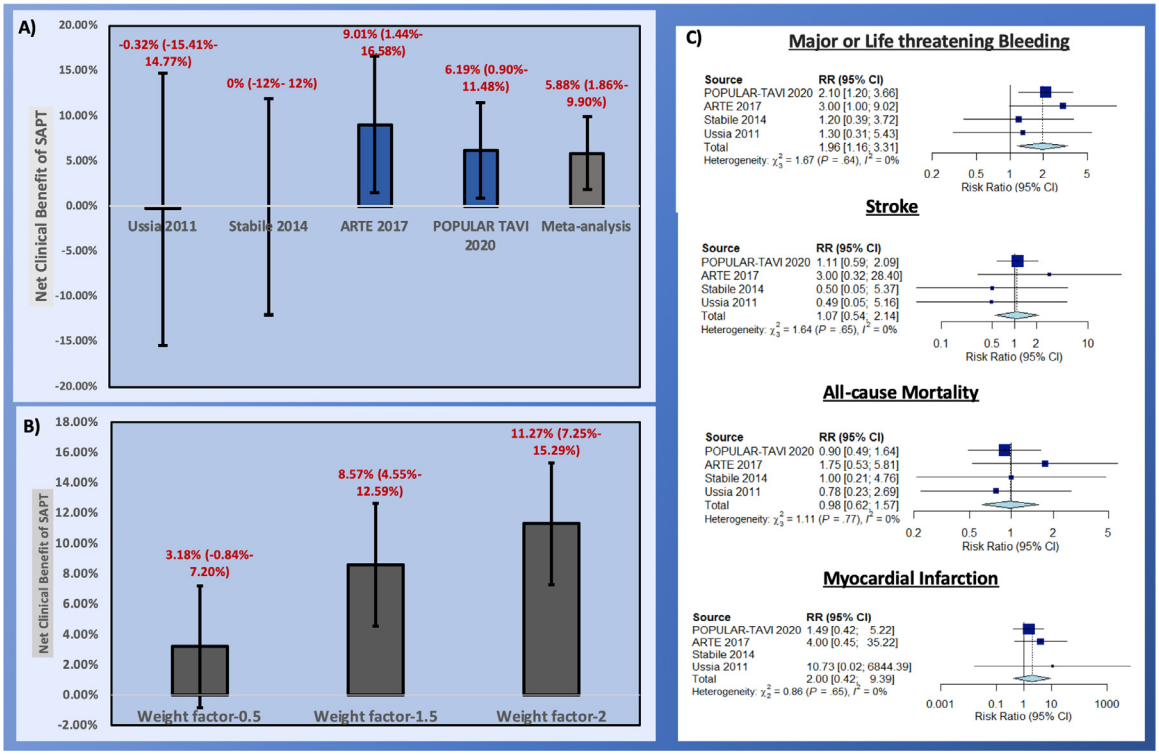

Figure 1. *(A)* Net clinical benefit of single antiplatelet therapy (SAPT) over dual antiplatelet therapy (DAPT) for the four RCTs and the pooled meta-analysis. With a weight factor of 1, pooled effect of RCTs showed a NCB of SAPT over DAPT (5.88% [95% CI: 1.86% to 9.90%])
(B) Sensitivity analysis of net clinical benefit of SAPT compared with DAPT (pooled meta-analysis) with weighting factors 0.5, 1.5, and 2.
(C) Pooled risk ratios and 95% confidence intervals of major or life-threatening bleeding, stroke, all-cause mortality and myocardial infarction; RR = risk ratio; CI = confidence interval. Single antiplatelet therapy was associated with significantly reduced risk of major bleeding or life-threatening bleeding compared with dual antiplatelet therapy.

with SAPT (RR: 1.96; CI: 1.16 to 3.31; I^2: 0%). However, there was no statistical difference in the risk of stroke (RR: 1.07; CI: 0.54 to 2.14; I2: 0%), all-cause mortality (RR: 0.98; CI: 0.62 to 1.57; I2: 0%), and myocardial infarction (RR: 2.00; CI: 0.42 to 9.39; I2: 0%) (Figure 1C). With a weight factor of 1, pooled effect of RCTs showed a NCB of SAPT over DAPT of 5.88% (95% CI: 1.86% to 9.90%). The NCB in individual RCTs were as following: ARTE 2017 trial: 9.01% (95% CI: 1.44% to 16.58%), POPular TAVI 2020: 6.19% (95% CI: 0.90% to 11.48%), Stabile et al: 0% and Ussia et al: −0.32% (−15.41% to 14.77%) (Figure 1A). On sensitivity analysis with a weighting factor 0.5, there was no net clinical benefit of SAPT over DAPT (3.18% [−0.84% to 7.20%]), however a net clinical benefit of 11.27% (7.25% to 15.29%) was observed for SAPT with a weighting factor 2 (Figure 1B).

Raheja et al[6] in their meta-analyses showed no significant difference in major/life-threatening bleeding rates between the 2 groups when the analysis was limited to RCTs and this can be attributed to inadequate power due to low sample size. However, results from the recently published POPular TAVI trial and updated analysis of the existing RCTs suggest that SAPT is superior to DAPT post-TAVI for patients with no indications for anticoagulation, with the advantage being offered mainly by reduced major or life-threatening bleeding rates in the former group.

Disclosure

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