Impact of on-clopidogrel platelet reactivity on incidence of peri-interventional bleeding in patients undergoing transcatheter aortic valve implantation

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Background: Transcatheter aortic valve implantation (TAVI) has become clinical routine for patients at intermediate to high risk for surgical aortic valve replacement. The optimal antithrombotic strategy following TAVI is still not well defined. Antithrombotic treatment is administered to prevent hypo-attenuated leaflet thickening, valve thrombosis, or ischemic stroke. However, most of these patients are also at high risk for bleeding. Current guidelines recommend dual antiplatelet therapy although the clinical evidence is limited.

Methods: This analysis enrolled patients undergoing TAVI from 11/2013 until 04/2018. Patients were either on long-term dual antiplatelet therapy with clopidogrel and aspirin or received a loading dose 300 to 600mg of clopidogrel and 400mg aspirin before TAVI. Platelet reactivity was determined by multi-electrode impedance aggregometry after stimulation with arachidonic acid and adenosine diphosphate (ADP) before TAVI as well as at day 1 and 5 thereafter. Peri-interventional bleeding was assessed up to 5 days following TAVI and coded according to BARC-classification.

Results: The present analysis included 484 patients (median age 83 [79–86] years; female sex 54.5%). There were 199 (41.1%) patients with a bleeding event. Most frequent were BARC 2 bleedings in 117 (24.2%) cases followed by BARC 1 (6.0%), BARC 3b in 25 (5.2%) and BARC 3a in 22 (4.5%) cases. On-clopidogrel platelet reactivity tested after stimulation with ADP was significantly lower in patients with bleeding events as compared to patients without bleeding (Figure). No differences were observed in arachidonic acid-induced platelet reactivity as marker for aspirin-efficacy between both groups over time. Multivariate logistic regression analysis identified on-clopidogrel platelet reactivity and use of oral anticoagulation as strongest independent predictors for bleeding events.

Conclusion: On-clopidogrel platelet reactivity is an independent predictor for peri-interventional bleeding in patients undergoing TAVI. Taken together with previous data indicating no association of on-clopidogrel platelet reactivity with peri-interventional ischemic events, the present data question the need for a strong peri-interventional dual antiplatelet therapy in patients undergoing TAVI.