

Correlation of platelet inhibition and cerebral thromboembolic events, as expressed with number of high-intensity transient signals, during Transcatheter Aortic valve Implantation

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Background: It has been shown that high Residual Platelet Reactivity (RPR) may contribute to platelet aggregation which propagates thrombosis on implanted materials. Therefore, we evaluated whether high RPR may predispose to an increased number of cerebrovascular emboli during Transcatheter Aortic valve Implantation (TAVI).

Methods: Consecutive patients who underwent transfemoral TAVI with a self-expandable valve were prospectively studied. A loading dose of P2Y12 inhibitor 24 hours preprocedurally was given. Additionally, aspirin was started one week prior to procedure in all patients. Platelet inhibition was assessed with P2Y12 reaction units (PRU) (Verify Now assay) as well as percentage of inhibition 30 minutes prior to procedure initiation. The number of High intensity transient signals (HITS) was assessed with Rimed Digi-Lite™ transcranial Doppler, setting a threshold for detection of HITS at 3dB, continuously, on both middle cerebral arteries during the whole procedure. Two observers reviewed offline the number of HITS.

Results: In total, 84 patients underwent TAVI (53 males, mean age=81.9yrs old ±8.98). Mean baseline PRU and percentage of platelet

inhibition was 258,24±43.03 (156–376) and 48,51%±40.05 (0–100%) respectively. In the treated patients the mean absolute total number of HITS and the number of HITS per minute recorded, was 566,63±272,32, (136–1432) and 6.7/min±3.3 (2.09–13.24) respectively. Significant positive correlation was found between baseline PRU levels and number of total HITS ($r=0.261$, $p=0.017$), (Figure 1). Multivariate regression analysis revealed that PRU was independent prognostic factor of total HITS ($\beta=0.708$, $p=0.06$).

In order to clarify the predictive role of platelet inhibition in the total number of recorded HITS a ROC analysis was performed, obtaining an area under the curve of 0.646 (95% CI 0.518 to 0.773, $p=0.047$). PRU-levels ≥ 169 were shown to predict number of HITS at the upper quartile with 76% sensitivity and 65% specificity.

Conclusion: High RPR after dual antiplatelet loading with a P2Y12 inhibitor and aspirin, resulted in larger burden of embolic HITS during TAVI procedure. A cut off point of 169 PRU units with 76% sensitivity and 65% specificity predicted detection of HITS at the higher quartile.

