Pattern of dual antiplatelet use and 12-month outcomes stratified by bleeding and ischemic risk in acute coronary syndrome patients undergoing percutaneous coronary intervention

B. Yan¹, A. Lai¹, H. Sun¹, T.K. Tam¹, G.M. Tan¹
¹The Chinese University of Hong Kong, Hong Kong, China

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Background: There is a need to understand real-world antiplatelet usage in different risk group patients to provide insights into personalised approach to acute coronary syndrome (ACS) patients undergoing percutaneous coronary intervention (PCI).

Purpose: We aimed to evaluate patterns and outcomes of antiplatelet therapy use in ACS patients undergoing PCI according to their bleeding and ischemic risks.

Methods: We retrospectively analysed 3,577 consecutive ACS patients who underwent urgent or emergent PCI from 16 hospitals in between Jan 2016 to Dec 2020. Patients were stratified according to their (i) bleeding risk using PRECISE-DAPT score ≥25 as high (HBR) and <25 as low bleeding risk (LBR) and further by (ii) ischemic risk if any one of the following: diffuse multi-vessel disease, chronic kidney disease, ≥3 stents implanted or lesions treated, total stented length >60mm, chronic total occlusion and history of STEMI is present as high ischemic risk (HIR) or absent as low ischemic risk (LIR). Pattern of dual-antiplatelet (aspirin plus clopidogrel or ticagrelor) use and 12-month outcomes including major bleeding, recurrent MI and cardiovascular (CV) death were compared between HBR, LBR, HIR and LIR groups. Independent predictors of antiplatelet therapy use and clinical events were identified using multi-variate analysis.

Results: Of 3,577 patients, 25.6% (n=914) are HBR and 74.4% (n=2663) LBR. 86.5% (793/914) of HBR patients also had HIR. Overall usage of aspirin plus clopidogrel was 48.4% and ticagrelor 48.3%. Usage of ticagrelor was significantly higher in LBR (54.0%) compared to HBR (31.8%) patients (p<0.01) but not significantly different between HIR (30.4%) and LIR (41.3%) patients (p=NS). HBR was an independent predictor against ticagrelor use with odds ratio of 0.48 (95% confidence interval 0.38 to 0.60). Aspirin plus ticagrelor compared to aspirin plus clopidogrel was associated with significantly lower recurrent MI rates in both HBR (9.3% vs. 22.7%) and LBR (3.0% vs. 6.0%, both p<0.01) patients, higher bleeding risk in HBR (1.7% vs. 0.5%, p<0.01) but not in LBR (0.6% vs 0.9%, p=NS) and no significant differences in CV death rates in both HBR (3.4% vs. 5.3%) and LBR (1.0% vs. 0.9%, both p=NS) at 12-months.

Conclusions: In our cohort of ACS patients undergoing PCI, a quarter have HBR of which majority also have HIR. Patients’ bleeding risk was a stronger determinant of dual-antiplatelet therapy choice than ischemic risk. Aspirin and ticagrelor was associated with significantly lower recurrent MI rates irrespective of bleeding risk but high major bleeding rates in HBR but not LBR patients. Our results support personalised approach to dual-antiplatelet therapy use based on bleeding risk.