Post-menopause women show increased levels in risk prediction scores with age as dependent variable


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Background: Men and women differ in outcome after percutaneous coronary intervention (PCI). However, frequently used scores for ischemic risk prediction in patients with cardiovascular disease do not include sex related factors. In this study, we aimed to analyze sex related differences in risk score prediction in patients after PCI in dependence from age-determined menopause.

Methods: In this mono-center analysis, we compared frequently used risk prediction scores for post PCI patients (GRACE [Global Registry of Acute Coronary Events], PRECISE-DAPT [PREDicting bleeding Complications In patients undergoing Stent implantation and subsEquent Dual Antiplatelet Therapy], NCDR-mortality and PARIS [Patterns of Non-Adherence to Anti-Platelet Regimen in Stented Patients]-thrombotic score) in male versus female post PCI patients in dependence from menopause (age determined) and age itself. Three-year follow-up was conducted to assess the incidence of MACCE (major adverse cerebro- and cardiovascular events) including all-cause mortality, myocardial infarction and stroke. Receiver operating characteristic (ROC) analysis was conducted to analyze predictive capacity of each score.

Results: 1,001 patients post PCI were included (38% chronic coronary syndrome [CCS], 61% acute coronary syndrome [ACS]). Out of these, 765 were male and 306 were female. Women were slightly older (68.1±11.5 vs. 73.3±11.3 years, p<0.0001). Male and female patients did not differ in achieved levels of risk score below the age of 55. In contrast, in the subgroups >55 years, GRACE, PD-DAPT and NCDR Mortality scores were higher in woman compared to men (GRACE – 120.5±27.89 vs. 128.5±29.97, p<0.0001; PD-DAPT – 26.46±13.13 vs. 30.66±12.76, p<0.001; NCDR Mortality – 345.79±18.33 vs. 40.8±20.62, p<0.0001). Interestingly, PARIS thrombotic score was reduced (4.02±2.28 vs. 3.6±2.3, p=0.027). After Propensity score matching for age, GRACE, PD-DAPT and NCDR Mortality did no longer differ whereby PARIS thrombotic was reduced in female patients in this analysis as well. ROC revealed a moderate predictive capacity for MACCE for all scores in this post PCI cohort with a numerically higher predictive capacity for women (GRACEAUC – 0.625 vs. 0.662; PD-DAPTAUC 0.589 vs. 0.660, NCDR-mortalityAUC 0.625 vs. 0.667; PARIS-thromboticAUC 0.594 vs. 0.638).

Conclusion: In this single center analysis of post PCI patients with ACS and CCS, we could reveal that the GRACE, PD-DAPT and NCDR-mortality risk scores show higher values in post-menopause women compared to men whereby the PARIS-thrombotic score was reduced. We revealed age as major driver for this discrepancy. Moreover, women showed a numerically higher predictive accuracy for the occurrence of MACCE in line with the demonstrated worse outcome after PCI in several cohorts.