| OP-010 | **PREDICTING THE OCCURRENCE OF MAJOR ADVERSE CARDIAC EVENTS WITHIN 30 DAYS AFTER A PATIENT'S VASCULAR SURGERY: AN INDIVIDUAL PATIENT-DATA META-ANALYSIS** |

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Introduction Major adverse cardiac events (MACE) – which include cardiac death and non-fatal myocardial infarction – are severe harmful outcomes that commonly arise after elective non-cardiac vascular surgeries. Current preoperative risk prediction models are not as effective in predicting post-operative outcomes. This talk will discuss the key results of an individual patient-data meta-analysis, based on data from six cohort studies of patients undergoing vascular surgery.

Objectives We aimed to determine a prediction model that dichotomizes patients into high and low risk categories of MACE within 30 days after noncardiac vascular surgery.

Approach This is an application of the minimum p-value method (MPM) to determine the optimal cut-off points for: (i) B-type naturietic peptide (BNP) and (ii) N-terminal pro B-type natriuretic peptide (NTproBNP) in predicting MACE within 30 days after non-cardiac vascular surgery. Elevated concentrations of these hormones are secreted into the blood in response to heart failure. We compare results from MPM with those based on the receiver operating characteristic (ROC) curve approach using logistic regression; develop and validate the prediction rule for MACE; and assess the robustness of the results under different statistical models.

Results The ROC curve approach (applied by Rodseth and colleagues) identified 116pg/mL and 277.5pg/mL as the optimal thresholds for BNP and NTproBNP, respectively. The minimum p-value method dichotomized these covariates as BNP: 115.57pg/mL ($p < 0.0001$) and NTproBNP: 241.7pg/mL ($p = 0.0001$). Our logistic regression analysis identified MINP_thrshld, the indicator variable of our MPM results for BNP and NTproBNP, as a stronger covariate than our ROC curve results. Our final prediction model contained variables MINP_thrshld, the type of surgery, and diabetes mellitus. Internal validation was performed using bootstrapping while mixed effects logistic regression and generalized estimating equations were performed for sensitivity analysis. Although our model was validated using 1000 samples, it was not robust against methods that accounted for clustering effects.

Conclusion As current preoperative risk stratification models are not as effective in predicting post-operative outcomes for vascular surgery patients, clinicians are at an advantage in using this model for the ease and accuracy that it provides. Further exploration into clustering effects is needed for determining the best model.