Bone morphogenetic protein 10 as predictor for adverse outcomes in patients with atrial fibrillation

E. Hennings¹, S. Blum¹, S. Aeschbacher¹, M. Coslovsky¹, S. Knecht¹, R.E. Paladini¹, P. Krisai¹, P. Kastner², A. Ziegler³, C. Mueller¹, C.S. Zuern¹, L. Bonati¹, D. Conen⁴, M. Kuehne¹, S. Osswald¹
¹University Hospital Basel, Basel, Switzerland; ²Roche Diagnostics GmbH, Penzberg, Germany; ³Roche Diagnostics International AG, Rotkreuz, Switzerland; ⁴McMaster University, Hamilton, Canada
On behalf of Swiss-AF investigators
Funding Acknowledgement: Type of funding sources: Foundation. Main funding source(s): Swiss National Science Foundation, Swiss Heart Foundation

Background: Patients with atrial fibrillation (AF) face an increased risk of death and major adverse cardiovascular events (MACE). Bone morphogenetic protein 10 (BMP10) is a novel atrial-specific biomarker, but data about its prognostic value in AF patients are lacking.

Purpose: We aimed to assess the predictive value of BMP10 for death and MACE in AF patients in comparison to N-terminal prohormone of B-type natriuretic peptide (NT-proBNP).

Methods: Baseline concentrations of BMP10 and NT-proBNP were measured in stable patients with AF enrolled in Swiss-AF, a prospective multicenter observational cohort study. Primary outcomes were all-cause death and MACE (composite of heart failure hospitalization, cardiovascular death, stroke, systemic embolism, myocardial infarction). Measures of discriminative power were used to compare multivariable Cox proportional hazard models using the different biomarkers.

Results: A total of 2219 AF patients were included with a median follow-up of 4.3 years (IQR 3.9, 5.1). Mean age was 73±9 years and 27% were women. Incidence rate per 100 patient-years of all-cause death and MACE increased across BMP10 quartiles (Figure 1). In the multivariable adjusted Cox proportional hazard model, the hazard ratio (HR) and 95% confidence interval (CI) of BMP10 was 1.60 (1.37; 1.87) to predict all-cause death, and 1.54 (1.35; 1.76) to predict MACE. For all-cause death, the C-index (95% CI) was 0.783 (0.763; 0.809) for BMP10, 0.784 (0.765; 0.810) for NT-proBNP, and 0.789 (0.771; 0.815) for both biomarkers combined. For MACE, the C-index (95% CI) was 0.732 (0.715; 0.754) for BMP10, 0.747 (0.731; 0.768) for NT-proBNP, and 0.750 (0.734; 0.771) for both biomarkers combined. When grouping patients according to clinical used NT-proBNP categories (<300, 300–900, >900 ng/l), higher incidence rates and adjusted HRs were observed for the primary outcomes in patients with high BMP10 in the categories of low NT-proBNP (all-cause death aHR 2.28 [1.15; 4.52], MACE aHR 1.88 [1.07; 3.28]) and high NT-proBNP (all-cause death aHR 1.61 [1.14; 2.26], MACE aHR 1.38 [1.07; 1.80]) (Figure 2).

Conclusion: The novel atrial-specific biomarker BMP10 strongly predicts all-cause death and MACE in patients with AF. BMP10 provides additional prognostic information in low- and high-risk patients according to NT-proBNP stratification.