Abstract: P5453
Cardiorenal biomarker N-acetyl-beta-D-glucosaminidase (NAG) potentially predicts mortality in chronic heart failure - A 10 year follow up

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Topic(s):
Chronic Heart Failure – Diagnostic Methods: Biomarkers

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Background: The strong relation between chronic heart failure (CHF) and chronic kidney disease (CKD) is well known as cardiorenal syndrome (CRS). The current study focused on the impact of novel markers of kidney injury next to the established cardiac marker NTproBNP as predictors for mortality in patients with CHF in a long term follow up.

Methods: We conducted a prospective longitudinal study. The novel renal biomarkers kidney injury molecule-1 (KIM-1), N-acetyl-β-D-glucosaminidase (NAG) and Neutrophil Gelatinase-Associated Lipocalin (NGAL) were assessed from urine samples. Additionally, blood levels of NT-proBNP were determined. The primary endpoint all-cause mortality was evaluated after a median follow-up of 104 months (interquartile range 42–117 months).

Results: 149 adolescents (mean age 62±12 years) with CHF (mean ejection fraction 32±9%) were enrolled. 79 (53%) patients died. The secondary endpoint was reached by 104 patients (70%).

The renal marker NAG (HR 1.02, p=0.002) was a significant and independent predictor for all-cause mortality next to the established cardiac biomarker NTproBNP (HR 1.0, p<0.001) using Cox regression analysis, opposite to KIM-1 as well as NGAL (each p=n.s.). Similar results were obtained for the combined endpoint of all-cause mortality and hospitalization for heart failure.

In a multivariate analysis model with biomarkers and clinical parameters NAG (HR 1.02, p=0.036) remained a significant predictor for all-cause mortality next to NT-proBNP (HR 1.0, p=0.027), older age (HR 1.04, p=0.004), the lack of diabetes mellitus (HR 0.39, p<0.001), reduced EF (HR 0.97, p=0.034) and creatinine (HR 1.45, p=0.026). Again similar results were obtained for the secondary endpoint.

Patients were stratified into groups with markers above and below Youden Index to calculate Kaplan-Meier analysis. A combined analysis of NT-proBNP (< and ≥1906 pg/mL) and NAG (< and ≥10 U/gUCr) revealed an increase of the predictive value of each marker: patients with all three markers above Youden index had the highest mortality rate (79%) compared to patients with one (43%) or none (26%) marker above Youden Index.

Conclusion: The current 10-years long-term follow-up suggests that the tubular biomarker NAG as cardiorenal biomarker in combination with NT-proBNP may allow to discriminate a high-risk collective of chronic heart failure patients. These findings emphasize the close relationship of kidney injury and renal function in patients with CHF.
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All-cause Mortality