Neurohumoral activation, health-related quality of life and vital exhaustion in patients with cardiovascular risk or heart failure

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Background:
Chronic heart failure (HF) is one of the most important health problems in the industrialized world. Its prevalence and incidence is steadily increasing. Nearly 50% of HF patients have a preserved ejection fraction. Several hormonal systems are involved in the pathophysiology of HF. **GDF-15** rises during inflammatory stress and tissue injury. **Galectin-3** can be connected to cardiac remodeling and inflammation. GDF-15, Galectin-3 and CTpro-AVP independently predict HF hospitalization and mortality. In the general population, elevated galectin-3 levels are also associated with de novo development of HF. Furthermore, it can be used as a target of HF therapy.

Methods:
We included 1510 patients with risk factors for HF or a verified diagnosis of HF, including HF patients with LVEF≥50%, from the observational Diast-CHF study. We analyzed the associations of biomarkers (CTpro-AVP, GDF-15 and Galectin-3) with vital exhaustion (VE) and health-related quality of life (QoL), using the Maastricht-Questionnaire and SF-36.

Results:
The mean age of our population was 66.8±8.0 years and 51.3% were men. **CT-proAVP** was significantly associated with poor SF-36 physical functioning (Rho (ρ)=−.105, p<0.001), physical role function (ρ=−.068, p=0.015) and general health (ρ=−.087, p=0.001). There was a positive association between **galectin-3** and SF-36 emotional role function (ρ=.064, p=0.033) and emotional wellbeing (ρ=.063, p=0.028). **GDF-15** correlated with VE (ρ=.155, p=0.029) and SF-36 physical function (ρ=−.232, p=0.001). The association between CT-proAVP, GDF-15 and physical functioning was independent of NT-proBNP, LVEF, grade of diastolic dysfunction, age, gender, diabetes, CHD, sleep apnea, previous myocardial infarction and heart rate (R²=0.25, p<0.001).

Conclusion:
In this study we show correlations between biomarkers, VE and QoL in patients with HF risk factors or diagnosed HF. These biomarkers are important predictors of severity and prognosis of HF, which could explain the association between CT-proAVP, GDF-15 and poor physical functioning and between GDF-15 and VE. In contrast, galectin-3 was positively correlated with SF-36 emotional wellbeing and emotional role function. Further research is clearly needed to delineate the complex underlying mechanisms.