Predictive Value for Galectin 3 and NTproBNP in Hemodialysis Patients

Luminita Voroneanu[1] , Dimitrie Siriopol[1], Mihai Onofriescu,[1] Ionut Nistor[1], Simona Hogas[1] Mugurel Apetrii[1], Mehmet Kanbay[2] and Adrian Covic[1]

[1]Nephrology Department, Faculty of Medicine, University of Medicine and Pharmacy "Gr. T. Popa", Iasi, Romania
[2]Department of Medicine, Division of Nephrology, Medeniyet University School of Medicine, Kadikoy, Istanbul, Turkey

OBJECTIVES

Galectin-3 is a member of the β-galactoside– binding lectin family; it plays an important role in inflammation, tumor growth and fibrosis. It promotes fibroblast proliferation and collagen synthesis, transforming growth factor-beta activation, and subsequent left ventricular dysfunction; it contributes to cardiac remodeling, and to development and progression of heart failure.
This biomarker was associated with cardiovascular events and death in general population and in a post hoc analysis of the 4D study (German Diabetes Mellitus Dialysis), which included 1168 hemodialysis patients with diabetes.
We studied the association of galectin-3 and NTproBNP with cardiovascular events and mortality in a prospective cohort study of stable hemodialysis patients.

METHODS

Baseline sertum concentration of galectin -3 and NTproBNP were measured in 173 stable dialysis patients from two dialysis cohort.

The participants were followed for a composite outcome (all-cause mortality and major CVE, including death, stroke, and myocardial infarction

RESULTS

The mean age was 58.6±14.8 years, 48.6% were male and 16.8% had diabetes.
The median levels of galectin-3 and NT-proBNP were 28.1 (IQR 18.7-40.4) and 4234 (1826.5-11581) pg/mL, respectively.
We further divided the patients into four groups according to median galectin-3 and NT-proBNP :
- Group 1: low NT-proBNP – low galectin-3;
- Group 2: low NT-proBNP – high galectin-3;
- Group 3: high NT-proBNP – low galectin-3;
- Group 4: high NT-proBNP – high galectin-3 values.

During a median follow-up of 36 months, there were 47 incident outcomes.
There was an increased risk for the outcome in patients with both NT-proBNP and galectin-3 values above the median (Group 4: HR=3.65, 95%CI 1.45-9.21), but not if only one of these biomarkers was above the median (Groups 2 and 3) – see figure 1 and table 1.
Age, hypertension, albumin and phosphorus levels were also associated with the outcome in the univariable Cox analysis (Table 1).
In the multivariable Cox analysis (Table 1), including all univariable associated with the outcome, only patients from Group 4 remained associated with an increased risk for death or CVE (HR=3.34, 95%CI 1.30-8.56).

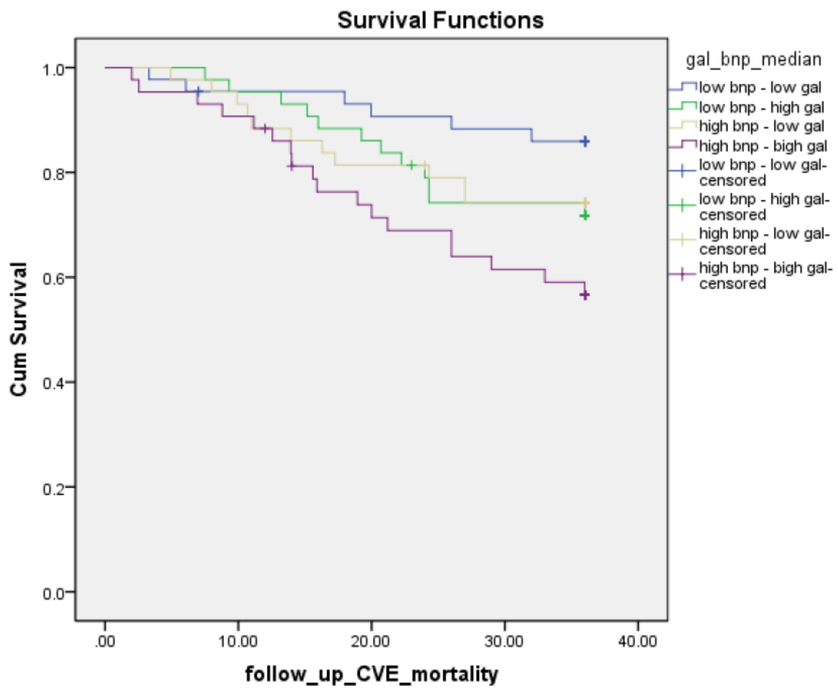

Figure nr. 1 - . Relation between Galectin3, NTproBNP and main outcome

	Univariate analysis			Multivariate analysis		
	HR[a]	95% CI	p	HR[a]	95% CI	p
NT-proBNP and Galectin3 groups						
Group 1	Reference			Reference		
Group 2	2.11	0.79-5.63	0.13	2.38	0.88-6.44	0.09
Group 3	1.98	0.73-5.35	0.18	1.95	0.70-5.44	0.20
Group 4	***3.65***	***1.45-9.21***	***0.006***	***3.34***	***1.30-8.56***	***0.012***
Age, years	*1.03*	*1.01-1.06*	*0.004*	1.02	0.99-1.05	0.10
Hypertension	*0.49*	*0.27-0.93*	*0.03*	0.65	0.34-1.24	0.19
Albumin, g/dL	*0.29*	*0.11-0.82*	*0.02*	0.56	0.18-1.73	0.31
Phosphorus, mg/dL	*0.85*	*0.72-0.99*	*0.048*	0.93	0.77-1.12	0.46

Table 1. Cox survival analysis for the main outcome.

CONCLUSIONS

The combination of Galectin-3 and NTproBNP is a strong predictor of mortality and cardiovascular events in asympthomatic dialysis patients.

This combination improved significantly the prognostic value compared with each parameter alone

REFERENCES

Motiwala SR, Szymonifka J, Belcher A, Weiner RB, Baggish AL, Sluss P, et al. Serial measurement of galectin-3 in patients with chronic heart failure: results from the ProBNP Outpatient Tailored Chronic Heart Failure Therapy (PROTECT) study. Eur J Heart Fail. 2013;15(10):1157-63.
Calvier L, Miana M, Reboul P, Cachofeiro V, Martinez-Martinez E, de Boer RA, et al. Galectin-3 mediates aldosterone-induced vascular fibrosis. Arterioscler Thromb Vasc Biol. 2013;33(1):67-75
Lok DJ, Lok SI, Bruggink-Andre de la Porte PW, Badings E, Lipsic E, van Wijngaarden J, et al. Galectin-3 is an independent marker for ventricular remodeling and mortality in patients with chronic heart failure. Clin Res Cardiol. 2013;102(2):103-10.
Drechsler C, Delgado G, Wanner C, Blouin K, Pilz S, Tomaschitz A, et al. Galectin-3, Renal Function, and Clinical Outcomes: Results from the LURIC and 4D Studies. J Am Soc Nephrol. 2015;26(9):2213-21

DOI: 10.3252/pso.eu.53era.2016