

## Oral Communication Abstract

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### Circulating Endostatin Levels and Cardiac Mortality in Hemodialysis Patients

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**Objectives:** Endostatin is a C-terminal fragment of type XVIII collagen released during extra cellular matrix remodeling. It was suggested as a biomarker to predict cardiovascular morbidity and mortality. We aim to clarify that circulating endostatin can predict cardiac mortality in hemodialysis (HD) patients.

**Methods:** A total 428 HD patients were prospectively recruited in K-cohort from June 2016 to March 2020. Mean follow-up period was 28 months. The serum endostatin, follistatin1 (FST1), galectin-3, and matrix metalloproteinase-2 (MMP-2) at the time of study enrollment were measured using enzyme-linked immunosorbent assay (ELISA).

**Results:** Multivariable cox regression analysis showed higher log endostatin was significantly associated with cardiac mortality. The cut-off value of endostatin for prediction of cardiac death was determined as 161.2ng/mL using univariable cox regression analysis. We divided the patients as a high (n=244) and low (n=184) endostatin group according to plasma endostatin level of 161.2ng/mL. The high endostatin group presented longer HD duration, more ultrafiltration volume, higher predialysis systolic blood pressure and, higher  $\beta$ 2-microglobulin than low endostatin group. In addition, cardiovascular ischemia or inflammatory markers, such as FST1, galectin 3 and MMP2, were significantly higher in high endostatin group. Cox regression analysis revealed that cardiac event (HR=6.51, p=0.01), cardiac death (HR 6.59, p=0.01), and all cause death (HR 2.32, p=0.01) was markedly increased in high endostatin group after adjusting age, BMI, diabetes, hypertension, LDL cholesterol, and use of statin.

**Conclusions:** The HD patients with high circulating endostatin (more than 161.2ng/mL) are likely to occur cardiac event, and cardiac death. Higher plasma endostatin might be a sensitive marker to predict cardiac outcomes

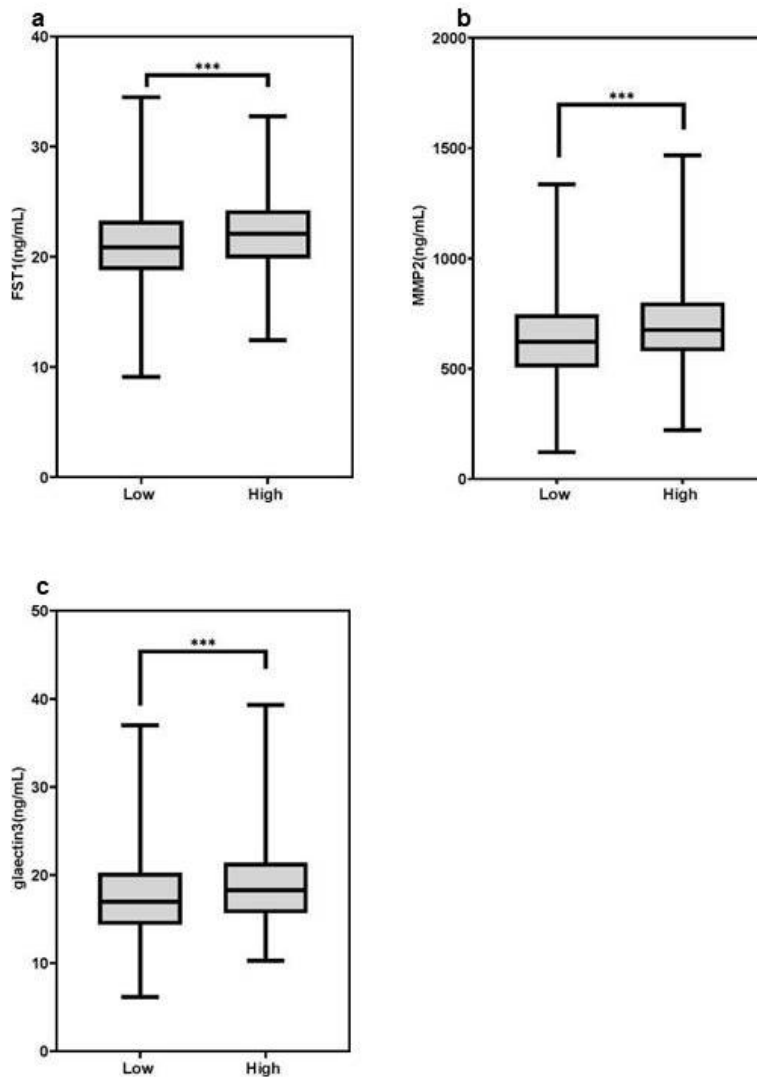
Table 1. Hazard ratios in accordance with circulating endostatin level.

**Table 1.** Hazard ratios in accordance with circulating endostatin level.

	Cardiac Event		Cardiac Death		All Cause Death	
	HR (95%CI)	p	HR (95%CI)	p	HR (95%CI)	p
<b>Model 1</b>						
Low	Reference					
High	1.34( 0.79-2.28)	0.28	5.26(1.21-22.83)	0.03*	1.71(0.97-3.04)	0.07
<b>Model 2</b>						
Low	Reference					
High	5.92(1.36-25.71)	0.02*	6.01(1.38-26.09)	0.02*	1.98(1.11-3.52)	0.02*
<b>Model 3</b>						
Low	Reference					
High	6.51(1.49-28.45)	0.01*	6.59(1.51-28.76)	0.01*	2.32(1.27-4.23)	0.01*

Model 1 : unadjusted, Model 2 : age, Model 3 : cardiovascular risk factors (age, body mass index, diabetes, hypertension, low-density lipoprotein, use of statin) \* p<0.05

Figure 1. Levels of various biomarkers according to circulating endostatin level.



**Figure 1.** Levels of various biomarkers according to circulating endostatin level. **(a)** Follistatin 1(FST1); **(b)** myocardial matrix metalloproteinase-2(MMP-2) ; **(c)** galectin3. Box plots show higher levels of biomarkers belonged to higher endostatin group. \*\*\* p<0.001