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NT-proBNP for Heart Function and Volume Status in Hemodialysis Patients

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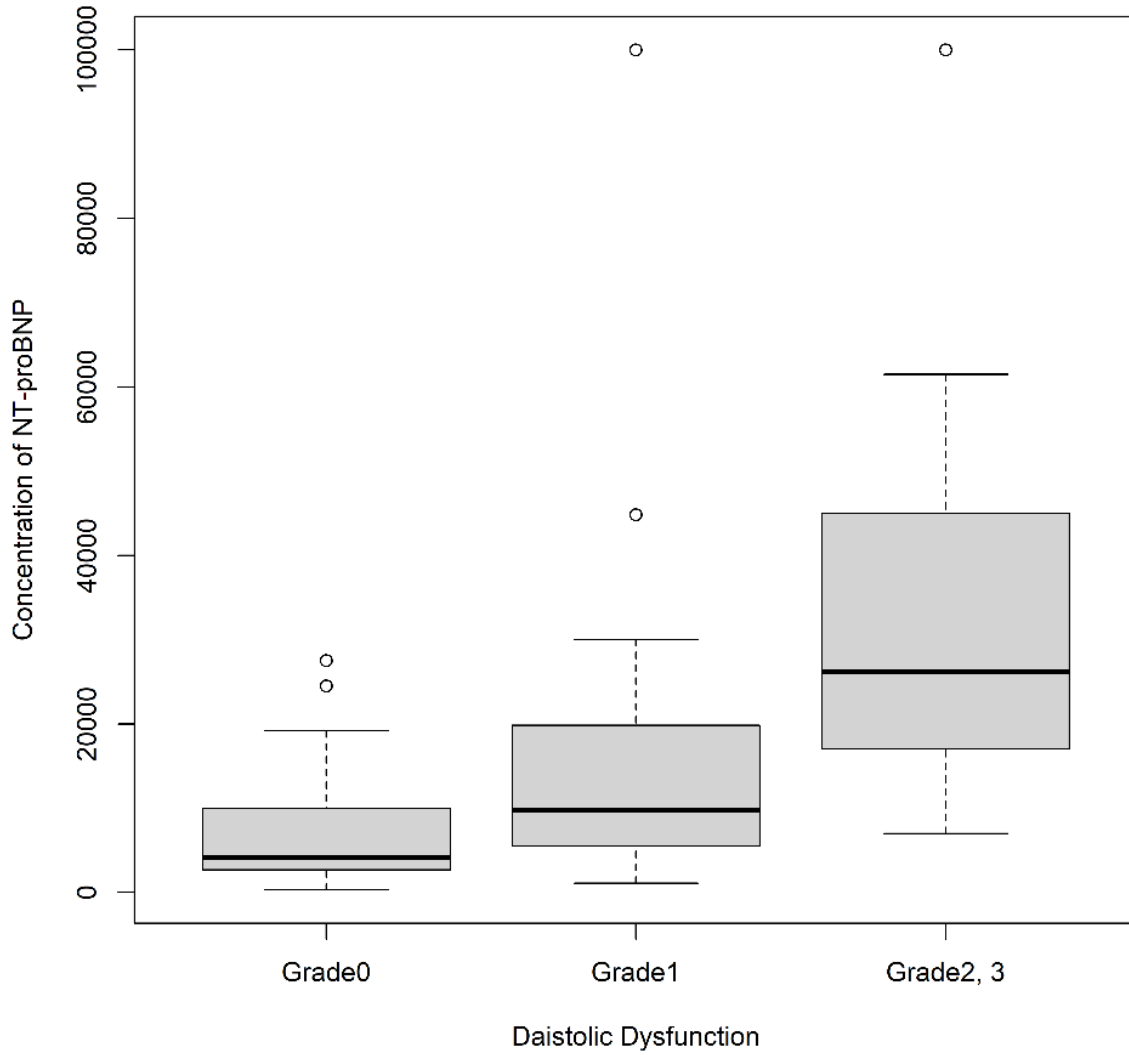
Objectives: N-terminal pro brain natriuretic peptide (NT-proBNP) is a biomarker that predicts heart failure and evaluates volume status in Hemodialysis (HD) patients. However, it is difficult to determine the cutoff value of NT-proBNP in HD patients. In this study, we analyzed whether NT-proBNP helps with predicting heart function and volume status in HD patients.

Methods: Retrospective study was conducted on 96 end-stage renal disease patients with HD. All patients underwent echocardiography and Bioelectrical Impedance Analysis (BIA) after a post HD session. Overhydration (OH) was measured by BIA. Serum NT-proBNP was measured after HD.

Results: There was an inverse correlation between NT-proBNP and ejection fraction (EF) ($\beta = -0.34$, $p = 0.001$). OH ($\beta = 0.33$, $p = 0.001$) and presence of diastolic dysfunction ($\beta = 0.226$, $p = 0.027$) had positive correlations with NT-proBNP. In the subgroup analysis with diastolic dysfunction grade, NT-proBNP increased as the dysfunction grade increased. (diastolic dysfunction grade 0; 4177 [2637 - 10391], grade 1; 9736 [5471 - 21110], grade 2,3; 24627 [16975 - 44988], interquartile range) Elevation of NT-proBNP above 11576 pg/ml was associated with the presence of diastolic dysfunction ($P < 0.001$), left ventricular hypertrophy (LVH) ($p < 0.001$) as well as EF<55% ($p = 0.07$). 'lowered dry weight' group followed up NT-proBNP one month later compared to 'no change in dry weight' group. NT-proBNP showed a tendency to decrease in 'lowered dry weight' group, and 'no change in dry weight' group showed a relatively low level of NT-proBNP variability. (delta NT-proBNP; -210 [-12899 - 3142] vs 330 [-1090 - 3858]; interquartile range, $p = 0.104$)

Conclusions: We confirmed that NT-proBNP is associated with volume status as well as heart functions such as diastolic dysfunction, EF and LVH in HD patients.

Serum concentrations of NT-proBNP significantly affecting diastolic dysfunction grade



Heart function according to NT-proBNP level



KSN 2021

FULLY VIRTUAL MEETING

 September 02 (Thu) - 05 (Sun)

Variables	NT-proBNP			NT-proBNP		
	<4058 (n=24)	≥4058 (n=72)	p value	<11576 (n=48)	≥11576 (n=48)	p value
EF (%)	<55	1(4.2)	0.174	3 (6.3)	10 (20.8)	0.070
	≥55	23(95.8)		60(83.3)	45 (93.7)	
Diastolic dysfunction	Yes	7(29.2)	<0.001	20 (41.7)	40 (85.1)	<0.001
	No	17(70.8)		18(25.4)	28 (58.3)	
LVH	Yes	4 (16.7)	0.004	7 (14.6)	34 (70.8)	<0.001
	No	20 (83.3)		35 (48.6)	41 (85.4)	