■ ♣Sat-305 ■

Association of time-averaged systolic BP with mortality and renal progression in patients with CKD

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Background/Aims: Recently, the American College of Cardiology/American Heart Association (ACC/AHA) released new blood pressure (BP) guidelines in adults that lowered BP targets to <130/80 mmHg. However, the optimal BP target to reduce the risk of mortality and renal outcome in patients with chronic kidney disease (CKD) remains controversial. This study evaluated the relationship between blood pressure (BP), mortality and renal function decline in patients with CKD. **Methods:** This retrospective longitudinal study used a cohort of patients with CKD at our institution. We identified 10,927 patients included from November 1999 and followed until June 2013. We obtained all of the BP data during follow up period from electronic medical records and averaged it in each patient. Patients with CKD were categorized into three groups according to time-averaged systolic BP (SBP) (Group 1, <120 mmHg; Group 2, 120 to <140 mmHg; Group 3, ≥140 mmHg). The primary outcome was mortality. The secondary outcome was the doubling of creatinine and the development of end-stage renal disease (ESRD). A multivariable time-dependent Cox model and inverse-probability-of-treatment weighting (IPTW) of the marginal structural model were used to estimate the risk of mortality and renal progression. **Results:** A total of 7,726 patients with CKD were included in the final analysis. In marginal structural model analysis, patients with Group 2 were associated with the lowest mortality independent of the time-varying confounders (hazard ratio [HR], 0.776; 95% confidence interval [CI], 0.642 to 0.948; P=0.0088) (Table 1). However, the higher the time-averaged SBP was associated with an increased risk of creatinine doubling (Group 3: HR, 1.902; 95% CI, 1.679 to 2.155; P<0.0001) as well as the development of ESRD (Group 3: HR, 2.872; 95% CI, 2.391 to 3.450; P<0.0001) (Table 1). **Conclusions:** Intensive BP control shows benefit in the renal outcome, but SBP lowered below 120 mmHg associated with increased risk of death in patients with CKD.

Table 1. Multivariable associations of time-averaged SBP with mortality and renal outcomes

	Hazard ratio	95% CI	*p*-value
Death			
Group 1: Time-averaged SBP <120	1.000	(reference)	
Group 2: Time-averaged 120<SBP <140	0.776	0.642-0.938	**0.0088**
Group 3: Time-averaged SBP>140	1.110	0.873-1.412	0.3948
Cr doubling			
Group 1: Time-averaged SBP <120	1.000	(reference)	
Group 2: Time-averaged 120<SBP <140	1.176	1.060-1.305	**0.0022**
Group 3: Time-averaged SBP>140	1.902	1.679-2.155	**<0.0001**
ESRD			
Group 1: Time-averaged SBP <120	1.000	(reference)	
Group 2: Time-averaged 120<SBP <140	1.576	1.340-1.854	**<0.0001**
Group 3: Time-averaged SBP>140	2.872	2.391-3.450	**<0.0001**

CI, confidence interval; MSM, marginal structural model; SBP, systolic blood pressure; Cr, creatinine; ESRD, end-stage renal disease.
Marginal structural models were used to adjust the hazard ratios for the following covariates: age, sex, diabetes mellitus, hypertension, cardiovascular disease, estimated glomerular filtration rate, proteinuria, hemoglobin, white blood cell, platelet, albumin, calcium, phosphorus, uric acid, renin-angiotensin-aldosterone system blockers, statin, b-blockers, calcium channel blockers, diuretics, warfarin, and antiplatelets.

■ ♣Sat-306 ■

Predicting intradialytic hypotension using heart rate variability

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Background/Aims: This study aimed to identify whether a new method using heart rate variability could predict intradialytic hypotension for one month of forward in patients undergoing prevalent hemodialysis (HD). **Methods:** This study is a prospective observational study. Baseline clinical characteristics and laboratories were collected with simultaneous measurement of HRV. Then, the frequency of IDH was collected during the observation period. HRV parameters consisted of heart rate (HR), R-R interval (RRI), the standard deviation of N-N interval (SDNN), the square root of the mean squared differences of successive NN intervals (RMSSD), very low frequency (VLF), low frequency (LF), high frequency (HF), total power TP), and LF/HF ratio. The negative binomial model was used for statistical analysis. **Results:** All 71 patients participated. During one month of the observation period, 28 patients had experienced one or more than one events of IDH. Among the clinical and laboratory parameters, ultrafiltration rate, the prior history of diabetes or coronary artery disease, age, and intact parathyroid hormone level were integrated into the multivariate model, referred as a basic model, which showed significant predictability for IDH (the area-under curve (AUC), 0.661; P=0.002). Among HRV parameters, changes between the early and the middle phase of HD (referred to Δ) were identified as the significant independent variables, including ΔHR, ΔRRI, ΔSDNN, ΔRMSSD, ΔVLF, ΔLF, ΔHF, and ΔTP. These HRV parameters were added to the basic model, resulted in a significant increase of the predictability (AUC, 0.768, P<0.001). The new intergroup comparison using the DeLong method showed the increased performance of the model using HRV parameters (P=0.024). **Conclusions:** It is shown the possibility that IDH could be predicted more accurately using HRV.

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	Hazard ratio	95% CI	*p*-value
Death			
Group 1: Time-averaged SBP <120	1.000	(reference)	
Group 2: Time-averaged 120<SBP <140	0.776	0.642-0.938	**0.0088**
Group 3: Time-averaged SBP>140	1.110	0.873-1.412	0.3948
Cr doubling			
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Group 2: Time-averaged 120<SBP <140	1.176	1.060-1.305	**0.0022**
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ESRD			
Group 1: Time-averaged SBP <120	1.000	(reference)	
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