

## KSN 2017 Abstract

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### Predictors of predialysis blood pressures over time in patients receiving maintenance hemodialysis

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**Objectives** : Predialytic blood pressure (BP) is an important predictor of mortality in patients receiving hemodialysis (HD). However, little has been known regarding the changes in predialysis BP over time.

**Methods** : This, single-center, retrospective study was performed from August 2010 to July 2014. From among 112 HD patients at the initiation of the study, we included 66 patients who met the following criteria: HD duration of >6 months, clinically stable patients, HD thrice a week, and >312 HD sessions during the study period. Demographic, 4-year pre-HD BP, HD, and laboratory data were collected. Baseline abdominal aortic calcification (AAC) severity was assessed by using the Kauppila scoring system. The generalized additive model (GAM) was used to identify independent factors that affected pre-HD BPs. Time series analysis (TSA) was performed to examine the characteristics of the changes in pre-HD BP according to independent factors.

**Results** : At the initiation of the study, the mean ( $\pm$ SD) age of the patients was  $61 \pm 11$  years; number of patients with diabetes mellitus (DM), 30; proportion of males, 50%; HD duration,  $6.1 \pm 3.8$  years; Charlson comorbidity index,  $3.8 \pm 1.6$ ; AAC score,  $5.5 \pm 4.5$ ; and number of antihypertensives used,  $1.6 \pm 1.3$ . The laboratory data showed the following values: blood urea nitrogen,  $66.7 \pm 17.1$  mg/dL; creatinine,  $11.9 \pm 4.5$  mg/dL; calcium,  $8.9 \pm 0.8$  mg/dL; phosphate,  $5.0 \pm 1.5$  mg/dL; total cholesterol,  $134 \pm 27$  mg/dL; low-density lipoprotein-cholesterol,  $75 \pm 22$  mg/dL; hemoglobin (Hb),  $10.5 \pm 1.4$  mg/dL; intact parathyroid hormone,  $138.2 \pm 140.3$  ng/mL; and albumin,  $3.9 \pm 0.4$  g/dL. In the GAM analysis, the independent factors were AAC severity, DM, sex, age, ultrafiltration (UF) amount, and Hb level in pre-HD systolic BP (SBP); AAC severity, DM, age, UF amount, and Hb level in pre-HD diastolic BP (DBP); AAC severity, DM, sex, age, serum albumin level, and phosphate level in pre-HD pulse pressure (PP). AAC severity and DM were the two most clinically significant factors. The patients were stratified according to AAC severity and

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DM status as follows: group 1 (AAC  $\geq 5$  + DM; n=16), group 2 (AAC  $\geq 5$  + non-DM; n=15), group 3 (AAC  $< 5$  + DM; n=14), and group 4 (AAC  $< 5$  + non-DM; n=21).

On the time series plot, pre-HD SBP, DBP, and PP were elevated by group 1>3>2>4, 4>2>3>1, and 1>2=3>4, respectively. The time series regression analysis on pre-HD SBP, DBP, and PP showed linear models, and the independent factors were non-DM and AAC score of  $<5$  ( pre-HD SBP =  $161.22 - 5.913 \times (1, \text{ if AAC} < 5; 0, \text{ if AAC} \geq 5) - 9.444 \times (1, \text{ if non-DM; } 0, \text{ if DM})$  [ $R^2 = 0.658$ ; Durbin-Watson value, 2.098], pre-HD DBP =  $66.261 + 6.834 \times (1, \text{ if AAC} < 5; 0, \text{ if AAC} \geq 5) + 2.874 \times (1, \text{ if non-DM; } 0, \text{ if DM})$  [ $R^2=0.799$ ; Durbin-Watson value, 1.825], pre-HD PP =  $94.959 - 12.747 \times (1, \text{ if AAC} < 5; 0, \text{ if AAC} \geq 5) - 12.318 \times (1, \text{ if non-DM; } 0, \text{ if DM})$  [ $R^2 = 0.871$ ; Durbin-Watson value, 1.667]).

**Conclusions** : Predialytic BPs may be mainly affected by previous values of BPs and influenced by the absence of DM and low AAC score.

**Keywords** : hypertension, hemodialysis, diabetes mellitus, vascular calcification