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## **Time-specific effects of predialytic factors on systolic blood pressure changes during hemodialysis**

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### **Objectives:**

Intradialytic blood pressure changes are affected by pre-hemodialysis (HD) factors. However, the specific time point at which these factors predominantly affect blood pressure during the intradialytic period is unknown.

**Methods:** Demographic, laboratory, and HD data were collected from October 2015 to December 2016 in 97 patients who were receiving maintenance HD. Diabetes mellitus (DM) status; abdominal aortic calcification (AAC) score; amount of ultrafiltration (UF); mean serum hemoglobin (Hb), sodium (Na), osmolality (Osm), and albumin levels were used as possible pre-HD factors. The patients were categorized according to AAC score (high: >8 and low: ≤8), quartile groups of mean Osm, and DM status. Intradialytic blood pressure changes were assessed on the basis of hourly systolic blood pressure changes ( $\Delta$ SBP) during each HD session ( $\Delta$ SBP<sub>1</sub>: between 0 and 1 hour of HD [SBP0-SBP1],  $\Delta$ SBP<sub>2</sub>: between 1 and 2 hours [SBP1-SBP2],  $\Delta$ SBP<sub>3</sub>: between 2 and 3 hours [SBP2-SBP3],  $\Delta$ SBP<sub>4</sub>: between 3 and 4 hours [SBP3-SBP4]). Linear mixed regression analysis was used to identify pre-HD factors associated with  $\Delta$ SBP<sub>1</sub>,  $\Delta$ SBP<sub>2</sub>,  $\Delta$ SBP<sub>3</sub>, and  $\Delta$ SBP<sub>4</sub>, respectively.

**Results:** The subjects' characteristics were as follows: female, 45; DM, 49; high AAC, 42; mean age, 59±15 years; HD duration, 69±64 months; and AAC score, 8.0±7.7 (median, 6.0). The mean serum Hb and albumin levels were 10.2±6.4 and 3.9±0.3 g/dL, respectively. The mean serum osmolality was 311.9±7.4 mOsm/kg.

UF was a factor for increased  $\Delta$ SBP<sub>1</sub>,  $\Delta$ SBP<sub>2</sub>,  $\Delta$ SBP<sub>3</sub>, and  $\Delta$ SBP<sub>4</sub> ( $\beta$ =1.18, p=0.002). The other factors for  $\Delta$ SBP<sub>1</sub> were DM ( $\beta$ =7.74, p=0.003) and mean Hb level ( $\beta$ =4.58, p=0.016); for  $\Delta$ SBP<sub>2</sub>, high AAC ( $\beta$ =4.23, p=0.011) and Osm4 (vs. Osm3;  $\beta$ =4.97, p=0.03); for  $\Delta$ SBP<sub>3</sub>, high AAC ( $\beta$ =2.12, p=0.045) and mean albumin level ( $\beta$ =-4.14, p=0.048); and for  $\Delta$ SBP<sub>4</sub>, mean Hb level ( $\beta$ =-2.76, p=0.011).

### **Conclusions:**

The pre-HD factors for intradialytic SBP changes may have their own predominant period during HD session.