

혈액투석환자에서 체수분상태에 따른 투석중 혈압의 양상

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Pattern of Intradialytic Blood Pressure Changes According to Hydration Status in Hemodialysis Patients

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Purpose: To investigate the hydration status in maintenance hemodialysis (HD) patients and its relationship with the pattern of intradialytic blood pressure changes.

Methods: Segmental multifrequency bioelectrical impedance analysis was performed pre- and post-HD cross-sectionally. Hydration status was classified as normohydration (NH) (≤ 0.35) and overhydration (OH) (> 0.35) with whole body ECF/TBW ratio. Blood pressure was measured hourly during HD. Differences of SBP between 0 and 1 hour (Δ SBP01), 2 hour (Δ SBP02), 3 hour (Δ SBP03) and 4 hour (Δ SBP04) of HD were calculated. Dry weight (DW) was predicted by the previous study (Nephrology 2009;14:705-711).

Results

1. Sixty eight patients were included. Mean ages were 54 ± 12 years, diabetics were 33 (48.5%), male was 26 and duration of HD was 3.7 ± 2.1 years. NH was 28 (41.2%) and OH was 40 (58.8%). In diabetics, NH was 11 and OH was 22. Differences between current and predicted DW were significantly higher in OH, compared to NH (1.88 ± 1.58 vs. 0.53 ± 1.10 kg, $p < 0.001$). Ultrafiltration amount (UF) was similar between OH and NH (2.0 ± 1.2 vs. 2.1 ± 1.2 kg).

2. OH showed significantly higher SBP than NH during each hour of HD (162.7 ± 30.2 , 156.1 ± 32.8 , 156.0 ± 30.7 , 153.7 ± 30.0 , and 153.5 ± 30.8 mmHg at 0, 1, 2, 3, and 4 hours of HD in OH; 146.8 ± 27.6 , 141.4 ± 25.1 , 139.0 ± 24.6 , 137.7 ± 28.1 , and 133.7 ± 29.5 mmHg at 0, 1, 2, 3, and 4 hours of HD in NH). However, DBPs were not different between two groups (78.3 ± 20.4 , 76.8 ± 18.8 , 77.4 ± 18.9 , 75.8 ± 16.7 , 75.9 ± 17.3 mmHg at 0, 1, 2, 3, and 4 hours of HD in OH; 76.5 ± 15.9 , 75.4 ± 14.1 , 76.3 ± 12.8 , 75.9 ± 13.9 , 72.5 ± 15.2 mmHg at 0, 1, 2, 3, and 4 hours of HD in NH). Furthermore, Δ SBP01, Δ SBP02, Δ SBP03, and Δ SBP04 were not different between two groups.

3. UF showed positive correlation with Δ SBP03 in both OH ($r=0.31$, $p=0.049$) and NH ($r=0.40$, $p=0.037$) and Δ SBP04 only in NH ($r=0.45$, $p=0.017$). However, UF was not correlated with Δ SBP01 or Δ SBP02 in both groups.

4. Curve equations fitted for the mean values of SBP during HD were $SBP = 162.5 - 8.3 \times HD \text{ hour} + 2.96 \times (HD \text{ hour})^2 - 0.37 \times (HD \text{ hour})^3$ in OH ($r=0.98$) and $SBP = 146.8 - 8.2 \times HD \text{ hour} + 3.1 \times (HD \text{ hour})^2 - 0.48 \times (HD \text{ hour})^3$ in NH ($r=0.99$).

Conclusion: The pattern of SBP and its changes during HD seems to be different according to the hydration status in HD patients. This finding might be helpful whether HD patients reach DW or not.

Key Words: 체수분, 혈압, 혈액투석

Body fluid, Blood pressure, Hemodialysis