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무뇨성 혈액투석 환자에서 투석액 나트륨 감량이 혈압과 투석간 체중증가에 미치는 영향

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The Effect of Lowering Dialysate Sodium on the Interdialytic Weight Gain and Blood Pressure in Anuric Hemodialysis Patients

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Background: Chronic volume overload is very frequent in hemodialysis (HD) patients and is related to adverse outcomes. A positive sodium balance is the major cause in volume-overloaded patients and is a result of a high sodium diet, a high dialysate sodium balance, or in many situations, the combination of both. High dialysate sodium concentrations lead to increased interdialytic weight gain (IWG) and blood pressure (BP) levels.

Purpose: We evaluate the effects of lowering dialysate sodium on IWG, BP, and volume status in anuric HD patients. We intended to investigate the safe rate of reducing dialysate sodium and the lowest level of sodium concentration tolerated with only minimal adverse effects.

Methods: This is an experimental therapeutic study and we enrolled 34 patients. The primary end point was the change of IWG and BP at the start and the end of the study. Secondary end point was the change of parameters related with hydration status through body composition monitoring (BCM). The prescribed dialysate sodium prior to the trial was 140 mEq/L. After break-in period for 1 month, the dialysate sodium was lowered from 140 mEq/L to 135 mEq/L by decreasing 1 mEq/L per month for 6 months. The IWG, pre- & post-HD BP and body volume status via BCM, and laboratory data before and after 1 month of the trial was recorded. And we compared the frequencies of adverse events such as intradialytic hypotension, cramps, and headache at the start and the end of the trial.

Results: Among 32 recruited patients, 8 had left the trial. 5 had transferred to other centers, 2 died, and 1 undergone the kidney transplantation. Twenty-four patients (21 men and 3 women) with a mean age of 63.6 years and mean dialytic vintage of 141.0 months entered the study (Table 1). Pre-HD BP also showed significant reduction (systolic BP 146 vs 138 mmHg; p=0.012, diastolic BP 80 vs 75 mmHg; p=0.008) (Fig. 1). IWG decreased significantly (1.9 vs 1.5 Kg; p=0.000). Pre-HD parameters of hydration status measured by BCM showed significant decline of total body water (32.3 vs 31.0 L; p=0.049), extracellular water (15.9 vs 15.7 L; p=0.020), overhydration (OH) (2.6 vs 2.0 L; p=0.042), and relative OH (0.16 vs 0.12 L; p=0.019) (Fig. 2). But there was no significant increase of the overall adverse events after lowering diaylsate sodium (Table 2).

Conclusion: This study showed that lowering dialysate sodium reduced pre-HD BP, IWG, and overhydration significantly without increasing adverse events.

Key Words: 투석액 나트륨 감량, 혈압, 투석간 체중증가
Lowering dialysate sodium, Blood pressure, IWG