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임상적으로 조정된 건체중과 생체임피던스를 이용한 정상/과체액 기울기법으로 추정한 건체중의 비교

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Comparison of Clinically Achieved Dry Weight with Estimated Dry Weight by Normovolemia/hypervolemia Slope Method in Commencing Hemodialysis Patients

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Background: Bioimpedance analysis (BIA) can be helpful to determine dry weight in dialysis patients. Unlike other methods using BIA, the normovolemia/hypervolemia slope method using BIA can calculate dry weight by kilogram directly, which is easy to use clinically. However, this method have not been validated by other investigators and not been widely introduced.

Methods: We measured body weight (BW) and extracellular water (ECW) by BIA (Inbody S20, Biospace, Korea) before first hemodialysis (HD) session. Thereafter, under blindness to BIS results, we adjusted patient's dry weight clinically for 6 months (achieved dry weight, aDW). aDW is not ideal but clinically achievable dry weight. We calculated estimated dry weight (eDW) by the slope method from BIA data and then compared aDW with eDW.

Results: Slope normovolemia (SNV) was established by measurement of BW and ECW with same analyzer in healthy 101 male (age 50.0±12.0 yrs, BMI 25.1±2.2 kg/m^2) and 58 female (age 46.4±13.9 yrs, BMI 22.7±2.8 kg/m^2). SNV was found to be 0.150 L/kg and 0.100 L/kg for male and female healthy cohort. Twenty-six new HD patients were included in prospective study (M:F=8:18, age 56.6±11.8 yrs, BMI 25.7±4.1 kg/m^2). The change of BW (baseline BW-aDW) was 4.3±5.7 kg. aDW and eDW were highly correlated (R=0.933, p<0.01) but aDW tended to be higher than eDW in most patients. Mean difference between aDW and eDW (aDW-eDW) was 3.5±4.1 kg. In Group with aDW-eDW <-2.0 kg, antihypertensive drugs could be much reduced although mean pre-HD systolic BP was slightly increased. In Group with aDW-eDW ≤±2.0 kg, mean pre-HD systolic BP and anti-hypertensive drugs tended to decrease comparing with that of Group with aDW-eDW >2.0 kg (Table 1).

Conclusion: eDW by the slope method using BIS may guide target BW in commencing HD patients, but in some patients it is hard to achieve with conventional HD treatment which has 4-hr duration, 3 times per week frequency. The slope method is should be further validated by prospective study with various population and BIA analyzer although it is theoretical and fancy.

Key Words: 생체임피던스 혈액투석 체중
Bioimpedance hemodialysis weight

Table 1. Mean Pre-Hemodialysis Blood Pressure and Antihypertensive Medication Changes in 3 Groups Divided by Difference between Achieved Dry Weight and Estimated Dry Weight

Group	n	aDW-eDW (kg)	△ preHD sysBP (baseline-6 m) (mmHg)	△ preHD diaBP (baseline-6 m) (mmHg)	△ antiHTN drug (baseline-6 m) (unit)
aDW-eDW <-2.0 kg	3	-3.5±1.4	-7.3±36.3	1.8±25.7	2.0±2.6
-2.0 kg≤aDW-eDW≤2.0 kg	6	0.5±1.2	6.7±17.5	-1.2±13.1	0.6±2.4
aDW-eDW >2.0 kg	17	5.8±2.6	3.0±23.6	2.4±13.0	0.2±1.8