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혈액투석시 한외여과에 의해 제거되는 수분은 주로 세포 외액이다

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The Source of Net Ultrafiltration During Hemodialysis is Exclusively the Extracellular Space Irrespective of Hydration Status, Presence of DM, Age, Gender

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Some patients have ever experienced frequent intradialytic hypotension (IDH). Fluid shifts are commonplace in chronic hemodialysis (HD) patients during the intra-dialytic periods. During ultrafiltration (UF), several liters of fluid are removed. However, characteristics of fluid shifts and which fluid space is affected is still controversial. Recently, an instrument that the source of fluid removed during HD can be easily and reproducibly measured is newly developed. Therefore, we designed this study to evaluate the fluid spaces most affected by UF and find out whether hydration status, presence of diabetes mellitus (DM), age and gender may influence the fluid shifts during HD. This is a prospective cohort study of 40 prevalent chronic HD patients receiving thrice weekly HD. We measured the patients' fluid spaces using a whole-body bioimpedance apparatus (BCM, software version 3.2; Fresenius AG) to evaluate the changes of fluid spaces before, 1hr, 2hr, 3hr, 4hr, and 30 min after HD. The 40 prevalent HD patients, aged 60.0±5.2 years (50% men; 50% patients with diabetes), and body weight 61.3±10.5 kg. Achieved UF was 2.18±0.78L on HD (measured fluid overload 2.15±1.24L). 1) Mean relative reduction of total body water was reduced from the start to the end of hemodialysis (before HD, 1.00; 1 hr, 0.99±0.05; 2 hr, 0.97±0.04; 3 hr, 0.96±0.05; 4 hr, 0.94±0.06, 30 mins after HD; 0.94±0.05, respectively). 2) Mean relative reduction of extracellular water was progressively reduced from the start to the end of hemodialysis (before HD, 1.00; 1 hr, 0.96±0.02; 2 hr, 0.94±0.03; 3 hr, 0.91±0.03; 4 hr, 0.89±0.04, 30 mins after HD; 0.89±0.04 respectively). 3) Mean relative reduction of intracellular water was not reduced from the start to the end of hemodialysis (before HD, 1.00; 1 hr, 1.01±0.10; 2 hr, 1.00±0.08; 3 hr, 1.01±0.10; 4 hr, 0.99±0.11, 30 mins after HD; 0.99±0.09 respectively). 4) There is no significant difference of fluid shifts according to hydration status, presence of DM, age, gender during HD. In conclusion, the source of net UF during HD is exclusively the extracellular space irrespective of hydration status, presence of DM, age, gender. So, IDH may be related to patients' difference of interstitial fluid shift to vascular space.

Key Words: 혈액투석, 수분 이동, 세포외액
Hemodialysis, Fluid shifts, Extracellular water

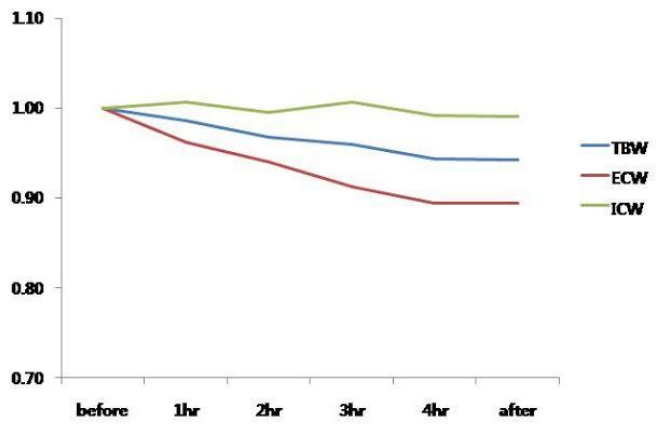

Fig. 1. Fluid shifts during hemodialysis.