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복막투석 환자에서 체내 수분 상태와 염증 및 영양 지표와의 연관성 (ASKK Study)

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Assessment of Volume Status and Its Relationship with RisK of Inflammation and Nutrition in Korean PD Patients (ASKK Study)

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Background : As volume overload is thought to be associated with microinflammation, endothelial dysfunction, malnutrition and cardiac dysfunction, to maintain adequate volume status in advanced chronic kidney disease seems to be important to prevent worse outcomes. We evaluated (1) the markers of inflammation and malnutrition in peritoneal dialysis patients according to objective volume status, and (2) the relationship of volume overload with cardiac dysfunction.

Methods : Two hundred peritoneal dialysis patients (mean age=49.2±10.8, 32% with history of hypertension, 37.5% with history of diabetes, dialysis vintage=45.6±51.1 months) from 5 nephrology center were included in the study. We measured the hydration status using body composition monitor (BCM): total body water (TBW), overhydration (OH), intracellular water (ICW), extracellular water (ECW), lean tissue mass (LTM), adipose tissue mass (ATM), body cell mass (BCM). Demographic and laboratory data including inflammatory markers (CRP, TNFα, MCP-1, IL-6, VEGF, Fractalkine) were collected. Left ventricular hypertrophy (LVH) and calcification score were evaluated.

Results : The patients with excess ECF volume more than 2.5 L (42% of all patients) showed lower lean tissue index (p=0.021), hemoglobin (p=0.003), calcium (p=0.024), protein (0.000), albumin (p=0.000), cholesterol (p=0.024) level and higher MCP-1 (p=0.00), TNF-α (p=0.004), Glucose (p=0.014), antero-posterior calcification score (p=0.041) compared to normohydrated and mild overhydrated patients. Overhydration was positively correlated with MCP-1, VEGF, Glucose, ALP, Height, systolic blood pressure and was negatively correlated with lean tissue mass , albumin, hemoglobin level (R^2=0.557, beta=-4.112, p=0.000). ECW/ICW ratio was also positively correlated with MCP-1, height, weight discrepancy between patients weight and ideal dry body weight, and negatively with lean tissue mass index, adipose tissue index, albumin, hemoglobin (R^2= 0.801, beta=1.877, p=0.000). Overhydration was an independent risk factor of LVH (OR=2.573 (95% CI 1.721-3.845, p=0.000), but did not increase the risk of vascular calcification.

Conclusion : In peritoneal dialysis patients, fluid overload was associated with microinflammation, malnutrition, and possibly cardiac dysfunction. Adequate volume monitoring in dialysis patients is a cornerstone to improve outcome in peritoneal dialysis patients.

Key Words : 체내 수분 상태, 복막 투석, 체성분 계측
Volume overload, Peritoneal dialysis, Body composition monitor