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복막투석을 시작하는 말기 신부전 환자에서RDW의 예후인자로서의 의의

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Predictive Value of Red Blood Cell Distribution Width on All-Cause Mortality in ESRD Patients on Peritoneal Dialysis

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Background: Red blood cell distribution width (RDW), which expresses variation in size of circulating erythrocytes, is routinely reported as a part of complete blood cell count test. Recent studies have demonstrated a strong independent association between increased RDW and the risk of adverse outcomes in patients with heart failure and coronary heart disease. In addition, RDW has been found to be predictive of all-cause mortality in two community-based cohorts irrespective of hemoglobin levels. Increased RDW levels are frequently observed in patients with end-stage renal disease (ESRD). In this study, we sought to determine whether RDW value is associated with mortality in ESRD patients treated with continuous ambulatory peritoneal dialysis (CAPD).

Methods: A retrospective analysis was undertaken in 197 incident CAPD patients, who started CAPD between Jan 2005 and Dec 2010 at Yonsei University Health System and maintained CAPD for more than 3 months. Demographic, biochemical and echocardiographic data of the patients were collected based on their medical records. Patients were divided into 2 groups according to the RDW levels at 3-month, and all-cause and cardiovascular mortalities were compared between groups.

Results: The mean age was 55.1 years and 115 patients (58.4%) were male. RDW at 3-month ranged from 11.3 to 16.8% (mean 13.6±1.1%), and 51 patients (25.8%) had RDW above the upper limit of normal value (>14.5%). There were significant positive correlations between RDW levels and age ($r=0.22$, $p<0.01$), Charlson comorbidity index (CCI) score ($r=0.27$, $p<0.01$), left ventricular mass index ($r=0.28$, $p<0.05$), left atrial volume index (LAVI) ($r=0.26$, $p<0.01$), the ratio of early mitral inflow velocity to peak mitral annulus velocity (E/E') ($r=0.16$, $p<0.05$) and left ventricular end diastolic dimension($r=0.271$, $p<0.01$). In contrast, RDW values were negatively correlated with hemoglobin($r=-0.16$, $p<0.05$) and albumin levels($r=-0.28$, $p<0.01$). The all-cause mortality rates were significantly higher in the high RDW group compared to the normal RDW group($p<0.05$). Cox regression analysis revealed that RDW was a significant independent predictor of all-cause mortality even after multivariate adjustment for age, gender, CCI score, hemoglobin, albumin, total cholesterol, LAVI, left ventricular ejection fraction(LVEF), and E/E' (HR 1.20, $p<0.05$).

Conclusion: This study demonstrates that RDW provide a meaningful prognostic value on all-cause mortality in incident CAPD patients.

Key Words: 말기신부전, 적혈구분포폭, 예후인자
RDW, Peritoneal dialysis, Mortality