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복막투석 환자에서 도관 제거 표시 인자로서의 Delta neutrophil index

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Delta Neutrophil Index as a Prediction Marker of Catheter Removal in Peritoneal Dialysis Patients with Peritonitis

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Background: Severe and prolonged peritonitis leads to peritoneal membrane failure and is probably the most common cause of technical failure in peritoneal dialysis (PD). Recent studies reported that delta neutrophil index (DNI), which reflects the fraction of circulating immature granulocytes in the blood, has been demonstrated to be a severity marker of infection. This study investigated the clinical utility of DNI as a prediction marker of catheter removal in peritonitis patients on PD.

Methods: A total of 126 PD peritonitis episodes in 93 patients who maintained PD at Severance Hospital between January 2012 and January 2015 were evaluated. We collected demographic, clinical, and laboratory parameters, retrospectively. Receiver operating curves (ROC) and multivariate logistic regression analysis were conducted to ascertain the clinical utility of DNI.

Results: Of a total of 93 patients, 42 (45.2%) were male and the mean age was 59.1±12.6 years. PD catheter was finally removed in 31 (24.6%) among 126 episodes of peritonitis. DNI in patients with PD catheter removal was significantly higher compared to that in patients who maintained PD catheters [3.30; interquartile range (IQR) 0.0-65.0 vs. 0.70; IQR 0.0-22.5, p=0.001]. DNI was correlated with percentage of segmented neutrophil (r=0.28, p=0.002) and serum albumin (r=-0.32, p<0.001) in blood, and leukocyte count of dialysis effluent (r=0.20, p=0.025), but not with C-reactive protein (CRP) (r=0.08, p=0.409). In a multivariate logistic regression analysis, DNI was a significant independent factor for PD catheter removal in patients with PD peritonitis [odds ratio (OR)=1.08, 95% confidential interval (CI)=1.01-1.12, p=0.018] after adjustment for serum albumin, CRP, leukocyte count of dialysis effluent, and the presence of septic shock. The area under the ROC curve of DNI for PD catheter removal was 0.69 (p=0.001), although area under the ROC of dialysate leukocyte count is not statistically significant (0.52, p=0.700). A DNI value of 2.0% was selected as the cutoff value for PD catheter removal (OR=3.38, 95% CI=1.43-7.99, p<0.004).

Conclusion: This study showed that DNI levels reflected the severity of PD peritonitis and higher levels of DNI could be an independent predictor of PD catheter removal in patients with PD peritonitis.

Key Words: 복막염, 델타 뉴트로필 인덱스, 도관 제거
PD peritonitis, Delta neutrophil index, Catheter removal