P-182

혈액투석 및 복막투석 환자에서 전체 림프구수와 림프구아수의 영양상태와의 관계

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Relationships of Total Lymphocyte Count and Subpopulation Lymphocyte Counts with the Nutritional Status in Patients Undergoing Hemodialysis/Peritoneal Dialysis

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Background: Dialysis patients' nutritional indicators are quite subjective and complex and cannot be easily measured in clinical settings. Based on previous reports that total lymphocyte count (TLC) and subpopulation lymphocyte counts (SLCs) are associated with nutritional status in patients with dialysis, we designed this study to examine the relationships of the TLC and SLCs with clinical outcome and nutritional status in patients undergoing maintenance hemodialysis (HD) and peritoneal dialysis (PD).

Methods: In this prospective, observational study, we enrolled 66 patients (50 HD patients and 16 PD patients) receiving stable maintenance dialysis. We evaluated the baseline parameters of height; weight; TLC; SLCs expressing CD3, CD4, CD8 and CD19; CBC; iron profile (iron, TIBC, ferritin); BUN; Cr; Na; K; total CO2; Ca; P; iPTH; total protein; albumin; total cholesterol; HDL; LDL; uric acid and CRP and calculated Onodera's prognostic nutritional index (OPNI) and the Geriatric Nutritional Risk Index (GNRI) at base line and three months. To analyze differences in the TLC and SLCs between the HD group and the PD group, we performed an independent samples t-test. Logistic regression analysis was performed to predict malnutrition in dialysis patients. In addition, to analyze changes in TLC, SLCs expressing each marker (CD3, CD4, CD8 and CD19) and other nutritional markers, we performed general linear model (GLM)-repeated measures ANOVA.

Results: Logistic regression analysis revealed that patients aged 60 years or older, women, and those whose CD19 SLCs were lower than 100 had a higher risk of developing malnutrition. The period of dialysis and OPNI were significantly shorter and higher, respectively, in patients with CD19 SLCs >100. In GLM-repeated measures ANOVA, CD19 SLCs were significantly higher in women and in patients with a shorter period of dialysis.

Conclusion: Our results indicate that TLC and SLCs (especially CD19 count) may be significant nutritional markers in HD and PD patients.

Key Words: 전체림프구수, 림프구아수, 투석
TLC, SLCs, Dialysis

Table 1. Clinical characteristics of 66 dialysis patients according to methods of dialysis at start of the study

Variables	HD (n=50)	PD (n=16)	P value
Age	55.8 ± 12.7	49.8 ± 14.5	0.127
Sex (Male/Female)	28/22	10/6	0.774
DM	18 (36%)	7 (43.8%)	0.768
Duration of dialysis (months)	59.7 ± 52.9	66.1 ± 33.6	0.653
Body Mass Index	21.3 ± 2.5	23.8 ± 4.1	0.005
GNRI	100.1 ± 8.4	99.2 ± 8.1	0.708
OPNI	47.0 ± 4.6	39.5 ± 4.3	0.003
Systolic blood pressure (mmHg)	138.0 ± 31.4	133.7 ± 24.1	0.568
Diastolic blood pressure (mmHg)	80.6 ± 16.6	80.8 ± 11.8	0.977
Kt/V	1.68 ± 0.22	1.85 ± 0.36	0.034
Urea Reduction Rate (%)	75.0 ± 4.5	NA	NA
Neutrophil Lymphocyte Ratio	0.38 ± 0.09	0.62 ± 0.25	0.036
TLCs (/mm^3)	1597 ± 512	1105 ± 658	0.019
CD3 count (/mm^3)	1015 ± 400	964 ± 366	0.655
CD4 count (/mm^3)	632 ± 260	585 ± 231	0.523
CD8 count (/mm^3)	384 ± 171	366 ± 171	0.731
CD19 count (/mm^3)	132 ± 85	127 ± 84	0.831
CD4/CD8 ratio	1.8 ± 0.7	1.7 ± 0.7	0.835
Parathyroid hormone (pg/mL)	191.2±199.7	389.1 ± 311.6	0.005
Albumin (g/dL)	3.9 ± 0.3	3.4 ± 0.3	0.001
Total cholesterol (mg/dL)	158.7 ± 0.4	182.5 ± 67.2	0.105
High density Lipid (mg/dL)	47.9 ± 18.2	43.1 ± 14.5	0.407
Low density Lipid (mg/dL)	71.8 ± 28.8	80.1 ± 30.2	0.383
Uric acid (mg/dL)	7.6 ± 1.7	7.4 ± 1.0	0.658

GNRI : Geriatric Nutritional Risk Index
OPNI : Onodera's prognostic nutritional index
Kt/V : Dialysis adequacy
TLCs : Total lymphocyte counts
NA : Not Applicable