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The effect of selenium deficiency on cardiovascular diseases in peritoneal dialysis patients

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Objectives : Trace element, selenium deficiency is known to associate with impairment of thyroid hormone, and it can cause cardiovascular diseases including, ischemic heart disease (IHD), heart failure (HF) or cardiomyopathy. In peritoneal dialysis (PD) patients, various causes may contribute to selenium deficiency, including decreased dietary intake, malabsorption, alteration of metabolism, and removal through dialysis itself. Therefore, we investigated the effect of selenium deficiency on thyroid hormone and cardiovascular diseases in PD patients

Methods : A total of 86 end-stage kidney disease patients who underwent PD in Jeju National University Hospital and Dankook University was recruited. The patients were divided into two groups based on serum selenium levels. Thyroid hormones such as TSH, free T4 were measured. And presence of cardiovascular diseases, using echocardiography, coronary computed tomography or coronary angiography were evaluated.

Results : Among the 86 patients, 66 patients were normal level and 20 patients were selenium deficient. There were no significant differences in baseline characteristics including age, sex, presence of diabetes mellitus, hypertension medication between the two groups. Thyroid hormone impairment, including hypothyroidism and subclinical hypothyroidism showed higher tendency in selenium deficient group than that in non- selenium deficient group. (11 % vs 30 % P=0.06) The prevalence of ischemic heart disease was significantly higher in selenium deficient group than that in the non-selenium deficient group. (35 % vs 14 %, p=0.05) But there was no difference in heart failure defined as ejection fraction with below 40%, and cardiomyopathy between the two groups. All patients with thyroid hormone impairment showed high prevalence of IHD and the coincidence of thyroid impairment and IHD was significantly higher

than that in selenium deficient group than that in non-selenium deficient group. (20% vs 5%, p=0.04)

Conclusions : Our study showed the significant higher prevalence of thyroid hormone impairment and IHD in PD patients with selenium deficiency. Selenium deficiency could contribute the cardiovascular disease, associating with thyroid hormone impairment

Keywords : Peritoenal dialysis, selenium, thyroid hormone, cardiovascular disease