

Abstract Type : Poster

Abstract Submission No. : PO-1741

The effect on selenium deficiency on thyroid dysfunction and cardiovascular disease in chronic hemodialysis patients

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Objectives:

Selenium is an essential trace element. Chronic hemodialysis(HD) patients are more likely to have selenium deficiency compared to healthy subjects. It has been known to protect the cardiovascular disease(CVD) and thyroid disease by protecting the oxidative stress using selenium-dependent glutathione peroxidase. Therefore, we investigated the selenium deficiency in HD patients and try to analyze the effect of selenium deficiency on thyroid hormone impairment and its correlation with CVD.

Methods: A total of 183-chronic HD patients were enrolled. Serum selenium level was assessed before HD using inductively coupled plasma-mass spectrometry. Based on tertile of selenium, the patients were divided into three groups: low-, intermediate-, and high- group. The presence of thyroid hormone impairment and cardiovascular disease were evaluated

Results:

Although the prevalence of hypothyroidism was not different among the three groups, instances of subclinical hypothyroidism was higher in the lower selenium group than those in the other groups (34% vs. 15% vs. 8%; $P=0.005$). Moreover, total thyroid dysfunction was significantly higher in the lower selenium group (38% vs. 18% vs. 15%; $P=0.005$). The prevalence of ischemic heart disease was most prevalent in the lower selenium group among the three groups, (49% vs. 25% vs. 22%; $P=0.002$). The prevalence of total CVD was highest in the lower selenium groups. (57% vs. 33% vs. 26%; $P=0.001$). In the analysis of the relationship between thyroid dysfunction and CVD, The prevalence of IHD was highest in the lower selenium group with thyroid dysfunction. ($p=0.039$)

Conclusions:

This study showed that selenium deficiency is associated with thyroid hormone impairment. And the thyroid hormone impairment showed the synergistic negative effect on CVD in HD with selenium deficiency patients.