

EFFECT OF SHORT-TERM VITAMIN E SUPPLEMENTATION ON BIOMARKERS OF (ANTI)OXIDANT STATUS IN HEMODIALYSIS PATIENTS

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Objectives: Recent meta-analysis has demonstrated that patients on maintenance hemodialysis (HD) might benefit from the antioxidant therapy for cardiovascular diseases prevention. In addition, many clinical studies have also demonstrated benefits from vitamin E supplementation in these patients, such as reduced inflammation, increased erythropoietin (EPO) responsiveness, decrease in the number of muscle cramps, etc. The aim of this study was to evaluate the effect of short-term vitamin E supplementation on plasma (anti)oxidant status in HD patients in correlation with their hemoglobin (Hb) concentrations.

Patients and Methods: Patients with end-stage renal disease on maintenance HD (N=16) were supplemented with vitamin E, 400IU/day for a period of 2 months. The patients were adequately monitored and treated with iron and EPO in accordance to the accepted guidelines on a long-term basis. Blood for analysis was drawn before the start of the supplementation, and one and two months later, immediately before the HD session. Biomarkers of (anti)oxidant status: Reactive Oxygen Metabolites (ROM), Biological Antioxidant Potential (BAP), and Total Thiol Levels (TTLs) were measured by photometric methods using commercial test kits. Uric acid and total proteins were measured by standard methods on an autoanalyzer. Hemograms were obtained with a five part differential hematology analyzer. Healthy subjects (N=20) were included in the study as controls.

Results: Overall, with the vitamin E supplementation there was a statistically significant decrease of BAP, and a clear, yet still not statistically significant, trend for increase of ROM. In addition, the TTLs significantly decreased. The changes of BAP and TTLs were not accompanied with statistically significant changes in plasma concentrations of uric acid and total proteins. When the patients were divided in two groups: a) Hb<120g/L (N=6) and b) Hb≥120g/L (N=10), it appeared that the significant changes in the (anti)oxidant status detected by the biomarkers used in this study are characteristic for the group of patients with Hgb≥120g/L only. In addition, a significant decrease in the uric acid also appeared in this group of patients. Although the changes in the (anti)oxidant status were very slight in comparison to the basal values and the values measured in the healthy subjects, they were more pronounced after two months of vitamin E supplementation, and might be indicative of its prooxidant effect.

Conclusions: Patients on maintenance HD respond differently on the vitamin E supplementation which is related to their Hb concentrations. Further studies are needed to establish the doses adequate for long-term supplementation and the most adequate biomarkers for monitoring of effects.