Vitamin E in Plasma of Patients with Chronic Renal Insufficiency

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Dear Sir,

Few reports have been published about vitamin E levels in patients with chronic renal insufficiency (CRI) [1, 2]; more reports are about vitamin E levels of uremic patients on maintenance hemodialysis [1, 3, 4]. The results are extremely variable, some reports giving high [1], some normal [3], and some low levels of vitamin E in plasma [4] and in red blood cells [2]. Some authors correlated low levels of vitamin E with increased susceptibility to red blood cell lipid peroxidation [2, 4], a possible cause of the short half-life of the red cells and thus of the anemia so common in uremic patients. Protein and calorie malnutrition is supposed to be important in depressing plasma vitamin E in adults [5] and in children, who often are also anemic [6]. The low levels have been attributed to low vitamin intake, impaired absorption and/or reduced blood lipids (carriers of vitamin E). Moreover, it has been shown [7] that the level of plasma vitamin E is highly correlated with total plasma lipids and with total plasma cholesterol. Since protein-calorie malnutrition, abnormal lipid patterns and anemia are often found in patients with CRI, we would gain more information about the vitamin E status in subjects as related to the severity of renal insufficiency and food intake comparing unrestricted food intake and two different prescribed diets [0.6 g protein/kg/day (A) vs. 1.0 g protein/kg/day (B)]. We also looked for any correlations between vitamin E levels and anemia or plasma lipids in order to solve the controversy of whether vitamin E supplements should be given [2, 4] or not [1, 3] in CRI.

Ninety subjects (53 men and 37 women, mean age 50.8 ± 13.3 years) with CRI (mean serum creatinine = 3.6 ± 1.9 mg/dl, range 1.3–11.9 mg/dl), enrolled between January 1985 and June 1986, were examined. All patients were checked at the beginning of the treatment (time = 0), when they were on an unrestricted diet. They were then randomly allocated to one of two diets (A and B) with different protein content but normal vitamin E content (15 mg/day), to see the effects of the low-protein diet on the evolution of CRI. During this period none of them took vitamin E supplements or was transfused. The plasma vitamin E levels of the patients were assayed by HPLC, by a partially modified method of Vuilleumier et

al. [8] and compared with vitamin E levels of 30 healthy persons (17 men and 13 women, mean age 27 ± 6 years, serum creatinine 0.9 ± 0.08 mg/dl) living in the same area. We also checked in our patients red blood cell counts, serum triglyceride, cholesterol and plasma creatinine. The compliance for the two diets was evaluated by a 3-day recall method and 24-hour urinary excretion (urea, phosphate and sodium).

The results are reported in table 1. Since there was no significant difference between plasma vitamin E levels of men and women, the patients were divided according to the diet only. Neither diet caused any significant differences throughout the period of feeding treatment. Comparable values were found for groups on both diets, and in comparison with the controls (table 1). There were no insufficient plasma levels (below $5.0 \mu\text{g/ml}$) in the patients. About 10% of the patients had low levels (between 5.0 and $7.0 \mu\text{g/ml}$) of plasma vitamin E. Another 10% of the patients had values higher than those of the controls. None of these differences were statistically significant. There was no positive correlation between mean RBC levels and plasma vitamin E. Plasma vitamin E levels were always significantly correlated with plasma triglyceride and cholesterol values ($p < 0.001$), even after the

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Table 1. Plasma vitamin E levels ($\mu\text{g/ml}$) of patients and controls

special diets. Expressing vitamin E values on the basis of triglyceride or cholesterol concentrations does not reveal any new relationships.

Serum vitamin E levels of patients with CRI do not significantly differ from those of controls, during the entire follow-up period, in accord with some data in the literature [1, 3]. Neither of the two different diets influenced the vitamin status of our patients, although they differed in protein content. Even in renal insufficiency, vitamin E levels are correlated with triglyceride and cholesterol values, but our data do not indicate any correlation between vitamin E levels and anemia in patients with CRI. In our opinion, vitamin E status does not seem to have any peculiar aspects in patients with CRI and supplementation does not seem necessary.

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