Ren Fail. 2000 Jan;22(1):73-80.

Effect of L-carnitine supplementation on red blood cells deformability in hemodialysis patients.

Nikolaos S[1], George A, Telemachos T, Maria S, Yannis M, Konstantinos M.
Author information

Abstract

Anemia is a serious problem in hemodialysis patients, the main cause of which is erythropoietin deficiency. After the discovery of recombinant human erythropoietin (rHuEpo) at the end of the last decade, the hematological profile of hemodialysis patients improved significantly but at considerable expense. The deformability of red blood cells (RBC) influences their microcirculation and tissue oxygen delivery along with their life span. We investigated the deformabilty of RBCs in 15 hemodialysis patients before and after three months on L-carnitine supplementation (30 mg/Kg body wt/dialysis session). We excluded from the study all patients who received blood transfusions three months before or during the study, patients who had hemorrhagic episodes, those with hyperparathyroidism or infections, and any who required surgical intervention during the study. The serum iron, folic acid and vitamin B-12 levels were kept normal during the duration of the study. The erythropoietin dose taken before the beginning of L-cartnitine supplementation was not changed. The deformability of RBCs before and after dialysis, prior to and following three months on L-carnitine was determined and compared to the deformability of RBCs from a control group. Hematocrit levels were measured before entry into the study and every month for three months. We found that the deformability of RBCs before the dialysis session was significantly greater than that found in the control group (t-test, $p < 0.00001$), and that there was a further increase after the end of the dialysis session. Three months following L-carnitine supplementation, we found a significant reduction of RBCs deformability (paired t-test, $p < 0.004$), and a significant increase in the hematocrit (ANOVA, $p < 0.0001$). We concluded that abnormalities in the deformability of RBCs improved after L-carnitine and that this was responsible for the increase in the hematocrit. This may allow a substantial reduction in rHuEpo dose.