Influence of 'Nonhematological' Doses of Erythropoietin on Lipid- Carbohydrate Metabolism and Life Quality in Hemodialysis Patients

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Dear Sir,

Erythropoietin administration is a well-established therapy of anemia in hemodialyzed patients. During the treatment, along with an increase in red blood cell number also an improvement of life quality (energy, well-being, sexual interest) was observed [1]. Moreover, recent studies have shown an impact of erythropoietin on a lipid-carbohydrate metabolism, immune system and endocrinological functions [2, 3]. Unfortunately, it is still unclear if all these changes are caused by a direct erythropoietin activity or they are associated with a correction of anemia. In the present study, we attempted to evaluate whether at doses of erythropoietin not affecting erythropoiesis, some of the effects mentioned above could be achieved.

Preliminarily, we selected six hemodialyzed patients: 3 male and 3 female, 4 of them suffer from primary glomerulonephritis, and 2 from polycystic kidney disease. All had relatively stable hematocrit (Ht), hemoglobin (Hb) and erythrocytes (Er) levels during the last 3 months (no blood transfusion) and they had never been treated with erythropoietin previously. After baseline data had been obtained, they were given erythropoietin (Eprex-Cilag) at a dose of 7-10 U/kg BW/ day, s.c., three times a week, for 12 weeks. The parameters presented in table 1 were measured in all patients, 1 day before hemodialysis, after a 12-hour fast.

The Hb, Ht, and Er values did not change significantly, but 4 of 6 patients noticed a great improvement in physical and emotional well-being. That is probably the result of the large fall of lactate levels in plasma. The levels of total cholesterol (TCH), LDL-cholesterol (LDL) and free fatty acids (FFA) had been declining gradually during the course of low-dose

erythropoietin therapy, but mostly in the first 4 weeks. It is possible that the hypolipemic effect is caused by a better utilization of FFA as a potential source of energy, before an augmented energetic demand is supplied with nutrition (the study was too short to determine whether this is going to be a long-term effect).

Considering an influence of cytokines on the lipid-carbohydrate metabolism, we also put our attention on interleukin-2 (IL-2) and TNF changes in plasma during the study [4]. During an observation period they remained elevated and we found a positive correlation between Δ IL-2 and Δ HDL-cholesterol (HDL) ($r = 0.869$) and a negative correlation between Δ IL-2 and Δ triglycerides (TG) ($r = -0.848$).

Concluding, the data obtained in this study support the hypothesis that low dose of erythropoietin has a lipid-lowering effect and seems to decrease an anaerobic metabolism. It means that it is possible to enhance a quality of life and probably improve a lipid metabolism in hemodialyzed patients with lower costs of therapy.

References

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