Does Recombinant Human Erythropoietin Affect Plasma Lipids in Hemodialysis Patients?

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Dear Sir,

The correction of anemia in hemodialysis patients with human recombinant erythropoietin increases appetite, anabolic effects, and improves physical, psychological activities and endocrine functions. As the sense of well-being improves, the patients increase food intake and frequently their compliance with dietary restriction may decrease. Plasma potassium must be monitored more frequently and, in some cases, the dialysis protocol is adjusted [1, 2]. Plasma lipid abnormalities are common among patients undergoing chronic hemodialysis, who are particularly prone to diffuse atherosclerosis [3]. During erythropoietin treatment, besides dietary changes, other factors related to hematocrit increase: tissue oxygenation, enzyme activity, physical and endocrine function improvement, all of which can influence lipid metabolism. There are a few and conflicting reports about the effects of erythropoietin on the lipid profile [1, 4, 5]. For these reasons it would be interesting to know whether long-term treatment with erythropoietin could induce changes in the lipid profile of hemodialysis patients.

The initial dose of erythropoietin was 100 U/kg per hemodialysis, and was then adjusted according to the Hb concentration. Thereafter, the patients affected by diseases or administered with drugs known to influence lipid metabolism were excluded from the final analysis. All lipid measurements were performed in a single laboratory with standard techniques. Dialysis efficacy (Kt/V) and patients' dry weight did not change significantly throughout this period. The lipid patterns in 23 patients taking erythropoietin, dialyzed 63.65 ± 7.01 months, and in 25 patients without erythropoietin because of absence of health insurance and dialyzed 59.52 ± 9.38 months, were analyzed. In this study, patient groups' predialysis blood total cholesterol, triglyceride levels, sex, age and time on hemodialysis were not significantly different ($p > 0.05$). In the patients taking erythropoietin, serum tri-glycerides, LDL cholesterol, apolipoprotein A1 and apolipoprotein B levels were higher than in the patients without erythropoietin ($p < 0.001$; table 1). Total cholesterol, lipo-

Table 1. Comparison of serum lipids and lipoprotein between hemodialysis patients with (Epo+) and without (Epo-) erythropoietin therapy

Table 2. Prevalence of potentially atherogenic lipid and apolipoprotein levels in hemodialysis patients with (Epo+) and without (Epo-) erythropoietin therapy

Epo+ (n = 23)
Epo-(n=25)
p value Serum levels
Epo+ (n = 23)
Epo-(n = 25)
p value

Concentrations (mean $\pm$ SD) are expressed in mg/dl.
Percentage values shown in parentheses.

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protein (a) and HDL cholesterol levels were not significantly different between the two groups ($p > 0.05$). The differences between the two groups were the lower mean concentration of apolipoprotein A_I and the higher prevalence of 'atherogenic' levels (i.e. < 90 mg/dl) of this lipoprotein in the patients not in the erythropoietin therapy group (table 2).

We conclude that long-term treatment with erythropoietin significantly changes some of the lipid patterns and improves serum apolipoprotein A_I levels in hemodialysis patients. Other studies and longer observation periods will be needed to confirm our results.

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