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Acute Effect of Erythropoietin on Catecholamine Levels in Uremia

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Dear Sir,

Approximately one third of the patients treated with recombinant erythropoietin (r-HuEPO) will experience either an aggravation of preexisting hypertension or will develop de novo hypertension [1]. But the mechanism is unclear and various causes such as increased blood viscosity and total red cell mass inducing an increase in peripheral resistance [2] and reversal of compensatory vasodilatation induced by renal anemia [3] have been proposed by several studies before. Besides, some investigators have suggested that r-HuEPO-induced alterations in sympathetic nervous system activity may contribute to the genesis of hypertension during r-HuEPO therapy [4, 5].

In order to clarify the relationship between r-HuEPO and sympathetic activity and determine whether r-HuEPO does have any direct effect on catecholamine levels, we studied serum concentrations of *L*-DOPA, dopamine, norepinephrine and epinephrine after a single dose of r-HuEPO administration in 12 predialysis uremic patients.

We included 12 patients with chronic renal failure untreated by dialysis previously (mean age 34.0 years, range 21–68; 5 females and 7 males). The patients had never taken r-HuEPO before and all medications having influence on the sympathetic activity were discontinued 2 weeks before the test. Since catecholamine levels are affected by position, all patients were kept in a supine position throughout the study, and other stresses that may increase plasma catecholamine concentrations such as exercise and smoking were avoided in these subjects. As it is a fact that pain and anxiety may transiently activate the sympathoadrenal system, blood samples were not taken by direct venipuncture but from an indwelling intravenous line. By convention, after the intravenous line was placed, the patients remained supine for 30 min at which time the baseline sample was withdrawn. After the baseline sampling at 8.00 a.m., r-HuEPO was given intravenously at a dose of 75 U/kg. Blood samples for analysis were taken at 15, 30 and 60 min after the injection and blood pressure readings were recorded simultaneously.

Serum *L*-DOPA, dopamine, norepinephrine and epinephrine levels were measured by high-performance liquid chromatography with electrochemical detection [6]. Student's

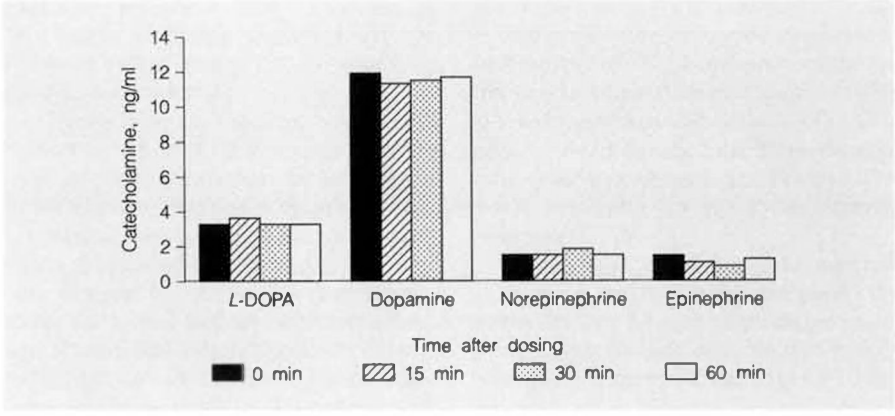

Fig. 1. Changes in catecholamine levels after r-HuEPO injection.

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paired t test was applied for statistical comparisons.

Mean blood pressure levels during the study were as follows: 141/78 mm Hg at 0 min, 140/80 mm Hg at 15 min, 140/81 mm Hg at 30 min and 139/81 mm Hg at 60 min. The determined changes in blood pressure readings did not show any statistical significance ($p > 0.05$). The observed differences between baseline mean serum levels of *L*-DOPA, dopamine, norepinephrine and epinephrine and those determined at 15, 30 and 60 min after r-HuEPO injection were not found to be statistically significant (fig. 1; $p > 0.05$).

In this study, we did not demonstrate any significant changes in biochemical parameters representing sympathetic nervous system activity after r-HuEPO administration. So, we conclude that r-HuEPO does not have any acute effect on serum catecholamine levels in uremia.

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