Erythropoietin Treatment: Influence of Haemoglobin Concentration on Dialyser Creatinine Clearance in Haemodialysed Patients

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Dear Sir,

Dialyser
Creatinine Clearance

Recombinant human erythropoietin has been shown to give promising results in haemodialysed patients with severe anaemia [1–3]. In some patients rising predialysis serum creatinine, potassium [1] and phosphate levels [4] were observed during the correction of anaemia. Apart from an increase in appetite a decreased dialyser clearance as a consequence of rising haematocrit levels has been proposed as an explanation [1]. However, so far no formal evidence of a reduction of the filter clearance related to increased haemoglobin concentrations has been given.

We studied the influence of the recombinant-human-erythropoietin-induced rise in haemoglobin concentrations on filter performance in 6 anaemic haemodialysis patients during a 6-month period. Haemodialysis was performed thrice weekly with cuprophane capillary dialysers for 12–13.5 h/week. No changes in haemodialysis schedules or medication were undertaken apart from an adjustment of the heparin dosage in order to prevent visible clot formation during dialysis. Blood flow and dialysate flow were 250 and 500 ml/min, respectively.

At the beginning of the 2nd hour of dialysis blood samples were obtained from the dialyser inflow and outflow for creatinine determination. Ultrafiltration was calculated from the patient's weight change. Haemoglobin was determined immediately before dialysis. Dialyser clearances were measured monthly and calculated using the formula [5]:

$$\text{clearance} = Q_b(C_{bi} - C_{bo}) + Q_f C_{bo}$$

where Q_b = blood flow, C_{bi} = creatinine concentration of blood entering the dialyser, C_{bo} = creatinine concentration of blood leaving the dialyser, and Q_f = ultrafiltration flow.

10 11 12 13 Haemoglobin, g/dl

Fig. 1. The relation between haemoglobin concentration and dialyser creatinine clearance. Whereas haemoglobin concentration rose from 7.4 ± 0.6 to 10.3 ± 0.3 g/dl (mean $\pm$ SD; $p < 0.001$), dialyser creatinine clearance decreased from 173.5 ± 7.5 to 153.9 ± 8.8 ml/min ($p < 0.01$) during the observation period. A significant inverse correlation between haemoglobin concentration and dialyser creatinine clearance was found (fig. 1).

These findings support the assumption that increasing haemoglobin concentrations are accompanied by decreasing dialyser clearances. In patients with rising serum creatinine, potassium and phosphate levels the need for an intensified dialysis schedule may arise.

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