THE INFLUENCE OF HAEMODIALYSIS AND OF ION-EXCHANGE RESIN ON THE POTASSIUM DISTURBANCE IN CHRONIC RENAL FAILURE

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During intermittent dialysis for chronic renal failure most patients develop severe oliguria, some total anuria. Since the concentration of potassium in the urine does not change appreciably, total potassium excretion falls. During this form of treatment urine volume fell below 300 ml per day in 5 of our patients while the pre-dialysis serum potassium level was markedly increased (Fig. 1). With a bath potassium level of 4.0-4.5 mEq/litre during dialysis, the serum potassium level rose considerably between dialyses, averaging about 0.5 mEq/litre per day (Fig. 2).

By the administration of 15 g of ion exchange resin (Dock, 1946) by mouth on 2 to 4 days between dialyses, the serum potassium concentration could be kept in the normal range. The daily increase in serum potassium averaged only 0.13 mEq/l. (Fig. 2). No conspicuous influence on serum sodium, calcium or blood pH was detected.

![Graph](image_url)

*Fig. 1. Serum potassium concentration in correlation to diuresis in patients with severe uraemia (creatinine clearance less than 4 ml/\(\text{min}\)) *values before dialysis "patients not treated with dialysis.*
Fig. 2. Rise of serum potassium concentration between the dialyses of two anuric patients and three patients with a diuresis less than 300 ml/day (A) before, (B) during treatment with ion exchange resin.

Before we started giving ion-exchange resins, patients complained of muscle weakness which was attributed to the rise in serum potassium level. This was abolished by the resin therapy. With this technique wide fluctuations in serum potassium level during and between dialyses can be avoided, even in patients with severe oliguria.

The alternative procedure—the use of dialysis fluid with low potassium concentration or without potassium—seems to us less desirable, since the serum potassium swings between subnormal and supranormal levels. Moreover, there is a danger of intracellular potassium deficiency. Hochrein et al. (1963) found in dogs an average fall in intracellular potassium in muscle of 30% after 4 to 10 hours of dialysis against a bath without potassium. However, we were not able to show any rise in intracellular potassium, compared with controls, during the hyperkalaemia induced by bilateral ureteric ligation in rabbits.

REFERENCES