

Ten patients with acute and 60 with chronic renal failure (both groups having hyperkalaemia), were managed at Kenyatta National Hospital in the medical wards and Renal Unit between August, 1995 and January, 1996. They were divided into seven different treatment groups, each consisting of ten patients. Treatment A glucose 25g i.v. with insulin 10 units i.v., treatment B 50 mmol of 8.4% sodium bicarbonate infusion, treatment C 0.5mg of salbutamol i.v. in 50mls 5% dextrose, treatment D was a combination of treatments A and B, treatment E was a combination of treatment B and C, treatment F was a combination of treatments A and C while treatment G was a combination of treatments A and B and C. Serum potassium was measured, 30 minutes, 1 hour, 2 hours, 4 hours and 8 hours after treatment. Plasma glucose concentration was measured before treatment was given and 1 hour after in all patients. Electrocardiography was done before treatment on all patients and repeated 30 minutes and 1 hour after treatment for the patients with hyperkalaemic changes on the initial recording. All treatment modalities had satisfactory potassium lowering effects. Of the single therapeutic approaches, treatment A and C were equieffective, but better than treatment B ($P < 0.001$). Amongst the two regimen combinations, treatment D and F were more efficacious than treatment E and all the single therapeutic approaches ($P < 0.001$). Treatment G was the most efficacious in lowering serum potassium in this study. All treatment modalities had maximum serum potassium lowering effect at 1-2 hours. A fall in plasma glucose concentration was a notable feature of treatments A and D, but significant hypoglycaemia occurred in 20% of patients receiving treatment A and in none on treatment D. The ECG changes of hyperkalaemia did not correlate with serum potassium levels. The normalisation of hyperkalaemic ECG alteration occurred within the first 30 minutes after treatment. In conclusion, combination therapies for hyperkalaemia appear to be more efficacious than single therapeutic approaches. Inclusion of salbutamol seems to protect against insulin induced hypoglycaemia. The maximum potassium lowering effect is observed 1-2 hours of administration of either agent. The potassium reducing effect remains significant compared to baseline values even after 8 hours. If dialysis cannot be instituted early enough it seems reasonable to repeat treatment every 4-6 hours to sustain the effect. Repeated administration of glucose with insulin may not be safe because of the hypoglycaemic effect. Other single and combination therapies can theoretically be repeated regularly until dialysis is initiated although this requires further clinical evaluation.