

Time-related changes in urinary aldosterone and electrolyte excretion during amiloride administration to congestive heart failure patients

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Previously, we have reported that the effects of amiloride on urinary potassium and magnesium, when administered over a 3-day period to 10 congestive heart failure patients receiving frusemide, were most marked on the first day of administration (Counihan, Dunne, Halley, Ryan & Ryan, 1978). Urinary 24 h aldosterone excretion was reported to be unchanged on the first day of amiloride but was significantly increased by the second day and even further increased by the third day of amiloride administration. Other workers have also indicated that amiloride administration results in elevated aldosterone levels (Bull & Laragh, 1968; Nicholls, Espiner, Hughes & Rogers, 1976). We decided to monitor daily the effects of continuation of amiloride treatment up to 9 days on urinary aldosterone and electrolyte excretion.

Three congestive heart failure patients were studied over 12-day periods. Days 1, 2 and 3 served as the control period when frusemide (40 mg/day) was administered. Days 4–12 inclusive served as the test period during which amiloride (10 mg twice daily) was added to the diuretic regimen. Twenty-four hour urinary excretion of electrolytes and aldosterone were measured daily. The data were analyzed using analysis of variance on a linear additive model. Comparison of both urinary aldosterone and electrolyte excretion between control period and different test days were carried out by *t* tests on weighted means.

Urinary aldosterone excretion was unchanged on day 4 (first day of amiloride administration) but was significantly increased on day 5 ($P < 0.01$). Urinary aldosterone excretion was still elevated on day 12 ($P < 0.01$). Urinary potassium excretion was significantly reduced on days 4, 5, 6 and 7 ($P < 0.01$ in each case). Urinary potassium was unchanged from the control period on days 8 and 9 but significantly increased on days 10, 11, 12 ($P < 0.01$ in each case). Urinary magnesium was also significantly increased on days 10, 11 and 12 ($P < 0.01$). Both plasma potassium and magnesium remained elevated, during amiloride administration, in the one patient in whom these parameters were monitored daily over the entire study period. Lymphocyte potassium and magnesium appeared unchanged in this patient.

These results suggest that continuation of elevated aldosterone levels in congestive heart failure patients is associated with increased urinary potassium and magnesium excretion despite amiloride administration.

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Hay Fever: Diagnosis and treatment with vitamin C

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