Randomized, Controlled Trial of the Effect of Dietary Potassium Restriction on Nerve Function in CKD

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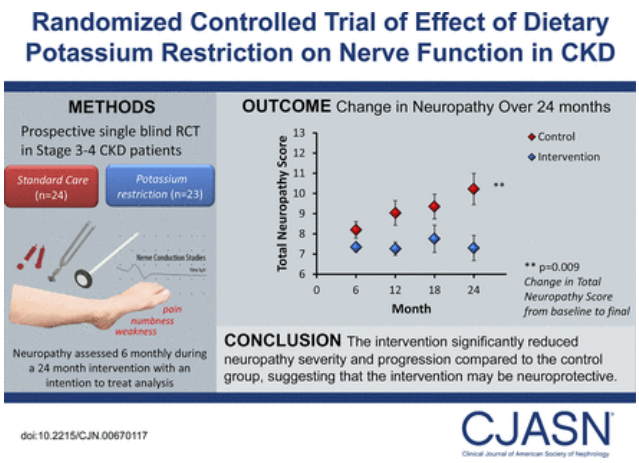
Visual Overview



Abstract

Background and objectives Neuromuscular complications are almost universal in CKD by the time that a patient commences dialysis. Recent studies have indicated that chronic hyperkalemia may contribute to the development of neuropathy in CKD. This study was undertaken to determine whether dietary restriction of potassium intake may be a neuroprotective factor in CKD.

Design, setting, participants, & measurements A 24-month prospective, single-blind, randomized, controlled trial was undertaken in 47 consecutively recruited patients with stages 3 and 4 CKD. The intervention arm (n=23) was prescribed a diet focusing on potassium restriction to meet a monthly serum potassium level of ≤4.5 mEq/L, with oral sodium polystyrene sulfonate provided if dietary advice failed to achieve the target. The control arm (n=24) received dietary advice regarding general nutrition. The primary outcome was the change in the total neuropathy score evaluated by a blinded observer. Secondary outcomes included electrolyte levels, gait speed, neurophysiologic parameters, and health-related quality of life scores. Five patients withdrew before initiation of treatment, and final analysis consisted of n=21 in each group.

Results There was a greater increase in total neuropathy score from baseline to final assessment in the control arm compared with the intervention arm (6.1±6.2–8.6±7.9 controls; 7.8±7.4–8.2±7.5 intervention; change 2.8±3.3–0.4±2.2, respectively; P<0.01). The intervention significantly reduced mean serum potassium compared with controls (4.6±0.1–4.8±0.1 mEq/L mean recorded every 6 months over the trial duration; P=0.03). There were no adverse changes in other nutritional parameters. Improved gait speed was also noted in the intervention

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arm compared with the control arm, with a mean increase of 0.15±0.17 m/s in the intervention group versus 0.02±0.16 m/s in the control group (P=0.01).

Conclusions Our results provide important preliminary evidence that dietary potassium restriction confers neuroprotection in CKD and should be confirmed in a larger multicenter trial.

chronic kidney disease | clinical trial | electrophysiology | Arm | Control Groups | Diet | electrolytes | Humans | Hyperkalemia | Neuroprotection | Nutritional Status | Polystyrenes | Potassium | Potassium, Dietary | Prospective Studies | quality of life | renal dialysis | Renal Insufficiency, Chronic | Single-Blind Method | Walking Speed | polystyrene sulfonic acid

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