

Diet therapy along with nutrition education can improve renal function in people with stages 3–4 chronic kidney disease who do not have diabetes: a randomised controlled trial

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Abstract

The current trial investigates the effect of renal diet therapy and nutritional education on the estimated glomerular filtration rate (eGFR), blood pressure (BP) and depression among patients with chronic kidney disease (CKD). A total of 120 CKD patients (stages 3–4) ($15 < \text{eGFR} < 60$) were randomised into an intensive nutrition intervention group (individualised renal diet therapy plus nutrition counselling: 0.75 g protein/kg/d and 30–35 kcal/kg/d with Na restriction) and a control group (routine and standard care) for 24 weeks. The primary outcome was the change in the eGFR. Secondary outcomes included changes in anthropometric measures, biochemistry (serum creatinine (Cr), uric acid, albumin, electrolytes, Ca, vitamin D, ferritin, blood urea nitrogen (BUN), and Hb), BP, nutritional status, depression and quality of life. The eGFR increased significantly in the intervention group compared with the control group ($P < 0.001$). Moreover, serum levels of Cr and the systolic and diastolic BP decreased significantly in the intervention group relative to the control group ($P < 0.001$, $P < 0.001$ and $P = 0.020$, respectively). The nutrition intervention also hindered the increase in the BUN level and the depression score ($P = 0.045$ and $P = 0.028$, respectively). Furthermore, the reduction in protein and Na intake was greater in the intervention group ($P = 0.003$ and $P < 0.001$, respectively). Nutritional treatment along with supportive education and counselling contributed to improvements in renal function, BP control and adherence to protein intake recommendations. A significant difference in the mean eGFR between the groups was also confirmed at the end of the study using ANCOVA ($\beta = -5.06$; 95% CI (-8.203, -2.999)).

Keywords: Renal function: Nitrogenous toxins: Protein-restricted diet: Education: Nutrition consult: Mental disorder

Chronic kidney disease (CKD) is a condition in which kidneys are damaged, leading to loss of filtration capacity and the aggregation of excessive fluid and waste products in the blood⁽¹⁾. The prevalence of CKD was less than 1% of the population in 1990, but it increased up to 12% in 2013, and it has now become a global health concern⁽²⁾. CKD is classified into stages 1–5 based on estimated glomerular filtration rate (eGFR)⁽³⁾. Over time, progressive CKD can end up with irreversible end-stage renal disease (ESRD)^(4,5). ESRD patients have many co-morbidities affecting their quality of life. The main nutrition-related goals in CKD are slowing down the disease progress and attenuating uremic toxicity. Maintaining good nutritional status also lowers

the risk of secondary complications, including CVD, anorexia, cachexia, bone disease, hyperlipidemia⁽¹⁾, oedema, anaemia and hypertension⁽⁶⁾. Besides, there is an association between depression and reduced kidney function and increased mortality in these patients^(7,8).

Medical nutrition therapy and medications are methods for controlling CKD. Medical nutrition therapy includes restriction in the intake of protein, Na, K, P and fluids⁽⁹⁾. Several studies have shown that restriction of protein and Na has a major role in controlling uremia and hypertension^(10–12). Yet, altering the dietary pattern and lifestyle of CKD patients is a real challenge⁽¹³⁾. A systematic review aiming to find benefits of multifactorial

Abbreviations: BP, blood pressure; BUN, blood urea nitrogen; CKD, chronic kidney disease; Cr, creatinine; DBP, diastolic blood pressure; eGFR, estimated glomerular filtration rate; ESRD, end-stage renal disease; SBP, systolic blood pressure.

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The authors declare that there are no conflicts of interest.

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