



Impact of a Low-Protein Diet on the Nutritional Status of Chronic Kidney Disease Patients Not on Dialysis

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ABSTRACT

Background: Chronic kidney disease (CKD) is a progressive condition requiring dietary interventions to delay disease progression. A low-protein diet (LPD) is often recommended for CKD patients to manage uremic symptoms and reduce renal workload. However, the impact of LPD on nutritional status is a concern. This study explores the effects of LPD on the nutritional status of patients with CKD who are not on dialysis.

Objective: To evaluate the effects of a low-protein diet on the nutritional status of patients with chronic kidney disease not undergoing dialysis.

Material and Methods: This prospective study involved 80 patients diagnosed with chronic kidney disease, managed in the Department of Medicine at a tertiary care hospital. Patient selection was based on clinical and biochemical markers confirming CKD. Patients were prescribed a low-protein diet (0.6–0.8 g/kg/day) and were monitored for six months. Parameters such as body mass index (BMI), serum albumin, hemoglobin levels, and estimated glomerular filtration rate (eGFR) were recorded at baseline and follow-up.

Results: The results showed a statistically significant reduction in serum urea and creatinine levels, with no severe deterioration in BMI or serum albumin levels over the follow-up period. The mean BMI decreased slightly, indicating that the diet was well-tolerated without leading to malnutrition. Table 1 and 2 summarize the clinical and biochemical findings.

Conclusion: The study demonstrates that a low-protein diet is effective in stabilizing renal function without significantly compromising the nutritional status of CKD patients not on dialysis.

Keywords: Chronic kidney disease, low-protein diet, nutritional status, BMI, serum albumin

INTRODUCTION:

Chronic kidney disease (CKD) is a public health issue characterized by the gradual loss of renal function over time. It often progresses to end-stage renal disease, requiring dialysis or transplantation (1). Nutritional interventions, particularly low-protein diets, play a crucial role in the conservative management of CKD. These diets help reduce nitrogenous waste production and uremic symptoms, thus slowing the progression of kidney dysfunction (2,3).

However, concerns remain about the impact of a low-protein diet on the nutritional status of patients. Protein-energy wasting is a common complication of CKD, which can worsen morbidity and mortality (4). Balancing the benefits of an LPD with the risk of malnutrition is critical, especially for patients not yet on dialysis (5). In this context, this study examines the effect of an LPD on the nutritional profile of CKD patients managed conservatively without dialysis.

The objectives of the study are to assess the impact of an LPD on BMI, serum albumin levels, and other nutritional markers in CKD patients.

Aim and Objectives

Aim:

To study the effects of a low-protein diet on the nutritional status of patients with chronic kidney disease not on dialysis.

Objectives:

1. To evaluate changes in body mass index (BMI) and serum albumin levels before and after the intervention.
2. To monitor the impact of LPD on renal parameters such as serum urea and creatinine.

Material and Methods

This prospective observational study was conducted in the Department of Medicine at a tertiary care hospital.

A total of 80 patients diagnosed with CKD were enrolled based on clinical and biochemical findings. Inclusion criteria included adults with CKD stages 3-5 not on dialysis, while patients with other chronic illnesses or on dialysis were excluded.

Dietary Intervention:

The patients were prescribed a low-protein diet of 0.6–0.8 g/kg body weight per day, with nutritional counseling provided to ensure adherence. Regular follow-ups were conducted every two months over six months.

Parameters Assessed:

- **Clinical Parameters:** BMI and hemoglobin levels
- **Biochemical Parameters:** Serum albumin, urea, creatinine, and eGFR

Statistical Analysis:

The data was analyzed using paired t-tests to compare baseline and post-intervention values, with $p < 0.05$ considered statistically significant.

Results

Table 1: Clinical Characteristics of the Study Population

Parameter	Baseline (Mean ± SD)	After 6 Months (Mean ± SD)	p-value
BMI (kg/m ²)	24.6 ± 3.1	24.2 ± 2.8	0.08
Hemoglobin (g/dL)	11.2 ± 1.3	11.0 ± 1.5	0.12

Table 1 shows that BMI and hemoglobin levels remained stable over the six-month period. A slight reduction in BMI was observed, but it was not statistically significant ($p = 0.08$), indicating that the low-protein diet did not adversely affect the patients’ nutritional status.

Table 2: Biochemical Profile of the Study Population

Parameter	Baseline (Mean ± SD)	After 6 Months (Mean ± SD)	p-value
Serum Albumin (g/dL)	3.8 ± 0.4	3.7 ± 0.5	0.18
Serum Urea (mg/dL)	60.3 ± 10.5	54.6 ± 9.8	0.03*
Serum Creatinine (mg/dL)	3.4 ± 0.8	3.1 ± 0.7	0.04*
eGFR (mL/min/1.73m ²)	34.5 ± 5.2	36.2 ± 5.7	0.09

Table 2 demonstrates a significant reduction in serum urea and creatinine levels after six months ($p < 0.05$). The serum albumin levels showed minimal decline, with no statistically significant change ($p = 0.18$), suggesting that the diet was well-tolerated.

Discussion

The findings of this study highlight that a low-protein diet effectively stabilized renal parameters without significantly compromising the nutritional status of CKD patients not on dialysis. Previous studies have shown the benefits of LPD in reducing uremic symptoms and slowing renal function decline (6,7).

The slight reduction in BMI observed in our study aligns with other research indicating the challenge of maintaining nutritional status while adhering to LPD (8). However, the stable serum albumin levels suggest that protein-energy wasting was prevented through regular monitoring and nutritional counseling (9).

These results are consistent with findings from studies that demonstrate improved outcomes with dietary interventions in CKD (10). Close monitoring of nutritional markers and adherence to dietary recommendations are crucial in preventing malnutrition in this population (11).

Conclusion

This study confirms that a low-protein diet can effectively stabilize renal function in patients with CKD not on dialysis, without leading to significant nutritional deterioration. Regular follow-up and nutritional counseling are essential for optimizing patient outcomes.

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