Nutritional Management of End-Stage Renal Disease Status Post-Kidney Transplant: A Case Report

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BACKGROUND

End-Stage Renal Disease (ESRD) is the final stage of chronic kidney disease and is characterized by irreversible loss of kidney function, metabolic dysregulation, systemic inflammation, and increased risk of protein-energy wasting.[1,2] Kidney transplantation is the preferred treatment due to improved survival and quality of life compared to long-term dialysis.[1,2] However, the early post-transplant period remains metabolically complex. Surgical stress, prior dialysis exposure, immunosuppressive therapy, and fluctuating graft function increase energy expenditure, protein catabolism, and the risk of electrolyte disturbances, insulin resistance, and dyslipidemia.[1,2] These factors heighten the risk for delayed wound healing, muscle loss, new-onset diabetes after transplant, cardiovascular complications, and long-term graft dysfunction.[2]

NUTRITIONAL CONSIDERATIONS

Evidence-based guidelines emphasize the critical role of medical nutrition therapy (MNT) in mitigating these risks. Current standards recommend:

- **Energy:** 25–35 kcal/kg/day (30–35 kcal/kg/day in early post-operative phase)[3]
- **Protein:** 1.2–2.0 g/kg/day immediately post-transplant to support positive nitrogen balance[2,3]
- **Sodium:** <2.3 g/day to assist with blood pressure and fluid volume control[4]
- **Electrolyte Management:** Individualized potassium (K+), phosphorus (Phos) , and magnesium (Mg) adjustments based on laboratory trends[2,5,6]
- **Nutrition Support:** Initiation of enteral nutrition (EN) when oral intake is inadequate; parenteral nutrition (PN) reserved for cases where EN is not feasible[4,6]

Drug-Nutrient Interactions of Immunosuppressive Therapy:

Calcineurin Inhibitors

→ Hyperkalemia, hypomagnesemia[1]

Glucocorticoids

→ Hyperglycemia, muscle catabolism[1]

CASE REPORT

SUMMARY

A 63-year-old female with a history of ESRD secondary to hypertension was admitted to inpatient rehabilitation following kidney transplantation. At the time of admission, the patient was prescribed a renal diet. Past medical history was significant for liver failure secondary to nonalcoholic fatty liver disease with a simultaneous transplant, hypertension, obesity, and multiple comorbidities. During the early post-transplant period, the patient experienced fluctuating renal laboratory markers, electrolyte abnormalities, and reduced oral intake. Increased metabolic demands related to surgical recovery and rehabilitation further elevated protein and energy needs. The clinical course required close interdisciplinary collaboration to stabilize metabolic parameters and support functional recovery.

ASSESSMENT

Anthropometrics:

- Height: 5'5"
- Weight: 147 pounds

Estimated Needs:

- Energy: 2005-2339 kcal/day (30-35 kcal/kg)
- Protein: 80-100 g/day (1.2-1.5 g/kg)

Diet History:

- Clinimix (PN) and EN in acute hospital

Current Diet:

- Renal diet
- Oral intake ≤75% of estimated needs

Nutrition-Focused Physical Exam (NFPE):

- Mild muscle and fat loss

Electrolyte Abnormalities

- Hyperkalemia, hypomagnesemia, hyperphosphatemia

Lab	Admission Value	Reference Range
Potassium	5.4 mEql/L	3.5-5.0 mEq/L
Magnesium	1.2 mg/dL	1.7-2.2 mg/dL
Phosphorous	5.7 mg/dL	2.5-4.5 mg/dL

NUTRITION DIAGNOSIS

Inadequate protein-energy intake related to increased metabolic demands secondary to ESRD and recent kidney transplant as evidenced by meal intakes ≤ 75%.

Altered nutrition-related lab values related to impaired renal function as evidenced by abnormal potassium, magnesium, and phosphorous lab values.

INTERVENTIONS

- Liberalized to a regular diet with low-potassium restriction to improve intake
- Recommended initiation of potassium binder, Lokelma, for hyperkalemia management
- Initiated oral nutrition supplementation between meals to meet increased protein-energy needs
- Provided education on food sources to support K+, Mg, and Phos management
- Monitored intake and electrolyte labs (K+, Mg, Phos) to guide adjustments

OUTCOMES

- Improved oral intake meeting ≥75% of estimated needs
- Hyperkalemia, hypomagnesemia, hyperphosphatemia resolved following pharmacologic and dietary intervention
- Improved strength and functional progress in rehabilitation
- Demonstrated understanding of dietary modifications and medication interactions

DISCUSSION & APPLICATION

In this case, early MNT supported recovery following kidney transplantation by addressing inadequate intake and electrolyte abnormalities in the setting of increased metabolic demands during rehabilitation. Diet liberalization with a targeted low-potassium modification allowed for improved oral intake while maintaining electrolyte management.

Barriers included reduced oral intake early in the rehabilitation stay, medication-related metabolic effects, and fluctuating electrolyte levels requiring adjustments to the nutrition plan of care. These factors required frequent monitoring and interdisciplinary coordination.

With close monitoring and patient education from the dietitian, a more liberalized diet was tolerated while maintaining electrolyte stability. Prioritizing adequate intake was important, as poor nutritional status and protein-energy wasting are associated with worse clinical outcomes.

CONCLUSION

Guideline-driven MNT is essential in post–kidney transplant care. Early optimization of energy and protein intake, individualized electrolyte management, and timely nutrition support improve metabolic stability and recovery. Integrating evidence-based MNT into rehabilitation practice supports graft function and reduces risk of protein-energy wasting.

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