



Chronic Kidney Disease is a Risk Factor for Malnutrition

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Introduction

In spite of our efforts to improve dialysis treatments, we are still facing a high and unacceptable mortality rate, approximately 24% in 1998. Malnutrition has been clearly shown to be a major risk factor for survival in hemodialysis patients.

There is a significant proportion of CKD patients who are malnourished. Protein intake has been shown to decrease as renal function deteriorates and these patients develop protein-calorie malnutrition. Potential prevention of the development of malnutrition may result in improving survival when dialysis is started.

We evaluated the nutritional status of CKD patients that were seen in a Renal County Hospital Clinic.



Material and Methods

We studied 86 patients with chronic kidney disease (CKD) that were seen in a County Hospital Renal Clinic. Their mean age was 55 ± 8 y., 67% were females. Their mean serum creatinine was 3.5 mg/dl (range 1.2 to 8.4 mg/dl). The original disease was diabetes in 49%, hypertension in 29%, Lupus in 9%, HIV nephropathy in 8% and glomerulo nephritis in 6%.

The patients were evaluated for cardiovascular co-morbidities, type of insurance, degree of education, socio-economic status, GI symptoms, physical activity and weight loss. Dietary diaries and anthropometric measurements were obtained in all patients. In 26 patients, we also measured urea appearance rate. CKD patients were staged according to K/DOQI guidelines.



Table 1. Patients demographics

Number of patients	86
Age (y)	55 ± 8
Male : Female	1 : 3
S. Creatinine mg/dl	3.28 ± 1.6
GFR ml/min	29.9 ± 21



Table 2. Original Disease (%)

Diabetes	49
Hypertension	29
Systemic Lupus E.	7
HIV nephropathy	9
Glomerulo Nephritis	6



Table 3. Type of Insurance (%)

Private Insurance	5
Medicare	51
Medicaid	39
No Insurance	5



Table 4. Financial status and Symptoms

- n Thirty nine per cent needed assistance to buy food
- n Appetite was decreased in 46%
- n GI symptoms were present in 40%
- n Weight loss was present in 59%
- n Physical activity was reduced in 85%

**Table 5. Symptoms and food intake
in CKD patients staged according
to K/DOQI guidelines**

Stage	1	2	3	4	5
Decreased Appetite (%)	20	25	44	44	43
GI Symptoms (%)	25	25	31	44	57
Physical Function (%)	50	50	68	77	78
Protein intake g/kg	0.85±0.7	0.6±0.2	0.6±0.4	0.6±0.3	0.9±0.3
Caloric intake Kcal/kg	22±6	16±4	15±4	16±5	23.5±7

Table 6. Anthropometric measurements and laboratory parameters in CKD patients staged according to K/DOQI guidelines

Stage	1	2	3	4	5
GFR ml/min	132±46	75±21	39±5	22±3	13±2
Weight loss Kg	4.5±3	5±4	9.3±4	9.7±5	7.6±9
BMI	37±17	31±2	31±7	26±7	21±3
MAC cm	35±9	38±7	35±6	30±6	27±3
TSF mm	29±17	31±12	27±13	18±10	10±3
S. Albumin g/dl	2.3±0.4	3.5±0.9	3.2±0.8	3.3±0.6	3.3±0.3
BUN mg/dl	18±7	23±13	36±12	53±19	55±12

Table 7. Laboratory parameters in CKD patients staged according K/DOQI guidelines

Stage	1	2	3	4	5
Hematocrit %	34±5	35±8	32±5	28.7±7	26.5±7
Calcium mg/dl	8.5±1	9.9±2	9.3±0.6	8.9±0.9	8.9±0.3
Phosphorus mg/dl	3.3±1	3.1±0.9	4±0.6	4.6±1.2	5.1±0.9
Bicarbonate mmol/L	28±5	25±5	24±3	23±4	19±2



Summary 1

- n The predominant causes of CKD were Diabetes and Hypertension.
- n Most of the patients had Medicare and Medicaid
- n An important number of CKD patients needed assistance to buy food
- n Appetite decreased and GI symptoms developed as renal insufficiency progressed
- n Protein and caloric intake were decreased very early in the progression of renal insufficiency (Stage 2)



Summary 2

- n As renal function deteriorated, CKD patients developed anemia, hyperphosphatemia and acidosis
- n All patients lost weight, especially those in Stage 3 and 4.
- n BMI, MAC and TSF progressively decreased as renal function deteriorated
- n Serum albumin was low in Stages 3-4 and 5