

## A Study on Nutritional Intake in Maintenance of Hemodialysis Patients

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### ABSTRACT

**Background:** When kidneys no longer work, the lives of many individuals with End Stage Renal Disease have been prolonged by dialysis. The most challenging component of dialysis treatment is the need to adhere to a complicated and restrictive dietary regimen.

**Aim:** The present study has been done to assess the nutrient intake of the patients.

**Methodology:** It was a cross-sectional study conducted at Dialysis unit of Yashoda Hospitals, Secunderabad on 100 hemodialysis patients. The tools used for the data collection were Anthropometry, medical information, 24-hr dietary recalls on dialysis day and on non-dialysis day and food frequency.

**Results:** The food intake was evaluated and compared to recommended intake. The mean intake of energy was  $1381.33 \pm 170.5$  kcal/day which is lower than the recommendations; only 61% of RDA was met by the patients. The average protein, fat and carbohydrate intake were also lower than the recommendations. The micronutrients requirements were within the normal range except phosphorus. When compared within the days the intake was high on dialysis day than on non-dialysis day.

**Conclusion:** Hence, it is concluded that, the nutrient intake was less than the recommendations; dietician has an important role in providing nutritional education to the patients to improve the nutrient intake.

**Key words:** Kidneys, Hemodialysis, Diet, Food intake

### INTRODUCTION

The kidneys are responsible for removing wastes from the body, regulating

electrolyte balance and blood pressure and stimulating red blood cell production. End Stage Renal Disease (ESRD) occurs when the kidneys are no longer able to function at a level that is necessary for day-to-day life. When this occurs, dialysis or transplantation is necessary to avoid further complications and death from the accumulation of fluids and waste products in the body. Patients with renal disease must follow a rigid diet, strict medication regimen and make many lifestyle and behavioural changes.<sup>[1]</sup>

Diet plays an important role in patients with end-stage renal disease (ESRD) and a slight increase in any component of diet can make a major difference in pathogenesis of disease. In CKD, nutrition and diet play an important role both in prevention of disease progression and in symptom management.<sup>[2]</sup>

Regular monitoring of individual hemodialysis patients' food consumption makes it possible to understand dietary habits and to define appropriate prescriptive measures for improved diet, something that is important in the prevention, treatment and monitoring of poor nutrition, be it a lack or an excess. Thus an understanding of food intake of these individuals, taking into account energy and nutrient consumption and dietary habits, is essential to ensure dietary guidance that is adapted to dialysis and involves the limitation of some elements along with an increased consumption of others.

The restrictions imposed on the patient by the need to control interdialytic weight gain and serum levels of phosphorus and potassium can often give rise to significant difficulties when it comes to following dietary recommendations and a balanced diet<sup>4</sup>. Shortcomings in intake of calories and proteins represent the food problems that are most commonly found in hemodialysis patients.<sup>[3]</sup>

In view of above criteria the present study was done to evaluate the consumption of various nutrients like carbohydrates, fats and micronutrients like sodium, potassium and phosphorus along with calories and proteins. The objective of this study is to assess the nutrient intake and to compare with the recommendations provided by KDOQI guidelines.

## METHODOLOGY

This was a cross-sectional study conducted on 100 hemodialysis patients at Dialysis unit of Yashoda hospitals, Secunderabad. The survey was done using questionnaire which included demographic information, anthropometric measurements, biochemical parameters, medical information, dietary information, 24 hr dietary recall of dialysis day and non-dialysis day and the food frequency table.

The inclusion criteria of the patients include CKD patients who are willing to participate in the study, Patients of age groups between 20-75 years of both genders and patients who are undergoing hemodialysis regularly from more than 3 months.

The exclusion criteria includes Patients of age less than 20 and more than 75 years of both genders, Patients who were not willing to participate in study and Patients with acute inflammatory illness like AIDS, hepatitis B, malignancy. Prior permission was taken from the administrator of the hospital and data collection was started.

The data was collected by interview method. The interview was done during the dialysis treatment. Anthropometric

measurements like height, weight before and after dialysis and Inter dialytic weight gain (IDWG) were collected from the dialysis case reports and biochemical parameters like hemoglobin, serum potassium, sodium, creatinine, blood urea, serum phosphate were recorded from patients medical reports.

For dietary assessment, each patient was interviewed about their daily consumption of different foods using 24-hour recall method by using standard cups and then converted into grams and calculated macro and micro nutrients using IFCT tables. Food frequency of most commonly consumed foods was taken.

## Statistical analysis:

All data were merged into excel sheet for compilation. Means, Standard deviation and percentages were used to present the respondents demographic profile, SGA, BMI, energy and nutrient intake and anthropometry. Biochemical parameters were compared with normal values.

## RESULTS

The sample consists of 64 males and 36 females with different age groups ranging between 23-75 years. The demographic profile showed that the 12% of respondents belong to high income group, 80% of respondents belong to middle income group and only 8% of respondents belong to low income group. Almost half of the respondents (50%) are graduates and only 4% were illiterates. Majority of the respondents are unemployed (68%) and 92% of respondents stay at urban areas.

## Anthropometric measurements:

Anthropometric measurements were taken from the patients. The average weight of the patients was  $65.1 \pm 12.5$ ; the average Interdialytic weight gain (IDWG) was  $2.1 \pm 1.09$ .

## Nutritional status:

Nutritional status was evaluated using modified SGA which showed 64% of the

respondents were well-nourished. According to BMI, 58% are normal.

Medical history was gathered from the patients, the results showed that 78% are hypertensive and 46% are diabetic patients. It is seen that about 64% of patients undergone dialysis thrice a week. And 45% of the respondents were on hemodialysis treatment from more than 1 year.

Biochemical parameters were taken from patients medical reports and compared with the normal values. The results showed that blood urea, serum creatinine were elevated than normal as expected.

**Table 1: Biochemical parameters**

Biochemical parameter	In present study	Normal values
Hemoglobin(mg/dl)	9.9±1.9	Men -13.5-17.5 Women-12-15.5
Potassium (mmol/l)	5±0.83	3.5-5.1
Creatinine (mg/dl)	7.46±2.53	0.66-1.25
Urea (mg/dl)	82.8±33.6	19-43
TLC(cells/mm <sup>3</sup> )	7820.1±2474	4000-11000
Calcium (mg/dl)	8.4±1.3	8.4-10.2
Phosphorus (mg/dl)	5.13±1.36	2.4-4.1

### Dietary survey:

The sample consists 70% of non-vegetarians and 16% ovo-vegetarian and only 14% of vegetarians.

The macro nutrients i.e. calories, proteins, carbohydrates and fats and micro nutrients – sodium, potassium, calcium, phosphorus were calculated using IFCT tables. The results showed that the mean intake of energy is 1381.33±170.5 kcal/day which is lower than the recommendations; only 61% of RDA was met by the patients.

The average protein intake was 52.2±37.8 gm/day which is lower than the RDA, fat and carbohydrate intake was also lower than the recommendations i.e. 35.4±5.65 gm/day and 207.33±33.15 gm/day respectively. The dietary recommendations are calculated by following KDOQI guidelines. Average body weight (65kgs) was considered for calculation of mean energy and protein. According to KDOQI guidelines calories are 35kcal/kg body weight and protein-1.2 gm/kg body weight.<sup>[5]</sup>

The micronutrients requirements were within the normal range except phosphorus which is slightly less than the recommended, fluid allowance varies from person to person; the average fluid intake was 1400 ml/day.

**Table 2: Macro and micro nutrients intake of the hemodialysis patients in comparison with recommended dietary allowances:**

Macro nutrients	RDA	Dietary recommendations	Mean intake (mean ±SD)
Energy (kcal)	35 kcal/ kg IBW	2275	1381.33±170.5
Protein (gm)	1.2 g/kg IBW	78	52.2±37.8
Carbohydrates (gm)	50% total calories intake	284	207.33±33.15
Fat (gm)	30% total calories intake	75	35.4±5.65
<b>Micro nutrients</b>			
Sodium (mg/day)	1500-2000	1500-2000	1747±121.5
Potassium (mg/day)	2000-3000	2000-3000	1786.9±1011.5
Calcium (mg/day)	2000 (including medication and dietary intake)	2000	458.5±110.2
Phosphorus (mg/day)	800-1200	800-1200	724±147.4
Fluid (ml/day)	750-1000 ml plus urine output	750-1000	1400

Note: Average body weight was considered for calculating energy and protein recommendations.

The dietary recall was taken on two different days i.e. dialysis day and non-dialysis day the results showed, the intake of macro nutrients i.e. energy, protein, carbohydrates and fat is comparatively higher on the dialysis day than on the non-dialysis day but none of the day patients met the recommendations.

### Food frequency:

The frequencies of commonly consumed foods were taken. The mostly consumed cereals are rice, wheat and semolina. About 94% of the respondents daily consume rice where as 48% of respondents daily consume wheat. The consumption of red gram dal and black gram dal is more, about 67% of the respondents consume red gram dal daily and 73% consumes black gram weekly.

Fruits and vegetables consumption is also seen, 99% of the respondents include

vegetables in their daily diet, 56% of them consume green leafy vegetable weekly and 49% respondents consume fruits weekly and only 38% respondents consumes fruits daily. 79% consume milk daily; about 54% respondents consume curd daily. Only 41% respondents consume eggs daily, 56% consume chicken weekly, it is seen that most of the respondents i.e. 58% never consumed mutton. It is seen most of the respondents do not consume soft drinks, fast foods and outside foods.

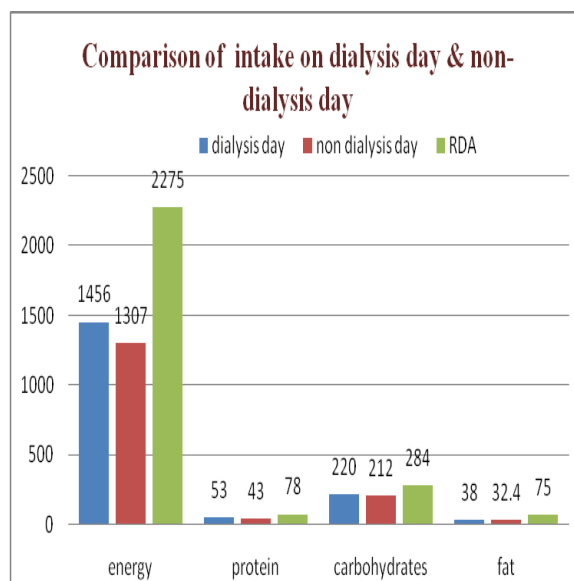


FIGURE 1: Comparison of intakes of dialysis day and non-dialysis with RDA

Table 3: food frequency

Food items	Daily	Weekly	Fortnight	Monthly	never
<b>Cereals</b>					
White rice	94%	1%	1%	-	4%
Brown rice	-	-	1%	1%	98%
Wheat	48%	36%	2%	2%	12%
Millets	6%	10%	5%	5%	74%
Semolina	6%	77%	4%	3%	10%
Oats	-	-	2%	4%	94%
<b>Pulses</b>					
Red gram dal	67%	30%	1%	-	2%
Green gram dal	-	11%	27%	27%	35%
Black gram dal	10%	73%	10%	3%	4%
<b>Vegetables and fruits</b>					
Green leafy vegetables	25%	56%	2%	2%	15%
Other vegetables	99%	1%	-	-	-
Roots and tubers	16%	78%	2%	2%	2%
Fruits	38%	49%	4%	4%	5%
<b>Milk and milk products</b>					
Milk	79%	9%	1%	-	11%
Curd	54%	24%	2%	6%	14%
<b>Nuts and oils</b>					
Refined oil	100%	-	-	-	-
Ghee	-	9%	30%	32%	29%
Nuts	2%	1%	4%	37%	56%
<b>Meat and Poultry</b>					
Chicken	3%	56%	4%	6%	31%
Beef/ mutton/pork	-	18%	7%	17%	58%
Egg	41%	40%	1%	1%	17%
Fish	3%	40%	11%	12%	34%
<b>Miscellaneous foods</b>					
Soft drinks	-	1%	1%	12%	86%
Sweets	-	-	8%	15%	77%
Pickles	-	2%	10%	17%	71%
Fast food/junk foods	-	2%	3%	8%	87%
Deep fried foods	1%	2%	2%	13%	82%
Outside foods	-	4%	6%	8%	82%

## DISCUSSION

As diet plays an important role in increasing or decreasing the severity of any disease. In CKD also diet plays an important, this study was done to know the

nutritional intake of the hemodialysis patients.

The main emphasis was put on dietary intake. There was a variation in intake

within the days; the energy and protein were high on dialysis day because the hospital provides 2 eggs, milk and bread during the dialysis which contributes to the increase in protein and calorie. Most of the patients do not consume egg on non-dialysis day and results in lower protein intake.

The same results are given in the study conducted by Barakat et al. (2017), the results showed that when the results were analyzed according to the day of the week, patients' mean energy intake was the highest on a dialysis day, and the lowest on the day after dialysis treatment.

Dietician has an important role in helping patients to improve their nutritional intake and by providing them suggestions regarding the restriction of nutrients like potassium, sodium, phosphorus and fluid.

## CONCLUSIONS

The present study which was done to assess the nutrient intake showed that the intake was less than the recommendations. Hence it is concluded that the dietician has to provide suggestions regarding the diet and help them to increase the nutrient intake and decrease the risk of complications.

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## REFERENCES

1. Stillman M A and Gonzalez E A, The incidence of pica in a sample of dialysis patients, *Journal of Psychology and Counselling*,2009. 1: 066-093.
2. Nagabushana S., Ranganatha M, Ranjith Kumar G. K., Virupakshappa, Evaluation of nutritional status in chronic kidney disease patients undergoing hemodialysis, *International Journal of Advances in Medicine*;2017,4(4):907-910.
3. Inaiana Marques Filizola Vaz, Ana Tereza Vaz de Souza Freitas, Maria do Rosário Gondim Peixoto, Sanzia Francisca Ferraz, Marta Izabel Valente Augusto Morais Campos, Food intake in patients on hemodialysis, *Brazilian journal for nutrition*, 2010,27(6):665-675.
4. Barakat R, Haviv YS, Geva D, Vardi H and Shahar D,Macro and Micronutrients Deficiencies within Hemodialysis Patient's Dietary Intake, Should we Re-Consider our Recommendations? *Scientific Literature of Nutrition and Metabolism*, 2017,1(1):115.
5. National kidney Foundation, KDOQI Clinical Practice Guidelines for Nutrition in Chronic Renal Failure,2005.

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