



Research Article

DIETARY INTAKE AND NUTRITIONAL STATUS IN HEMODIALYSIS PATIENTS

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Article Received on: 01/01/19 Approved for publication: 11/03/19

DOI: 10.7897/2230-8407.1004132

ABSTRACT

This study was conducted on 50 CKD-5 patients during the year 2016-17, considered stable from, 3 months of regular dialysis at least 2 times in a week dialysis centre in MLB, Medical College Jhansi. Dietary intake was estimated by 24-hour recall and analysed after 30 days three times the average dietary intake of 1580.5±164 kcal/day; carbohydrate 204.3±19.0 gm/day; lipid, 49.0±4.6 gm/day, protein 54.0±4.8 gm/day. The significant prevalence was observed for the inadequacy of calories intake and other nutrients. Hemodialysis patients had a lower intake of fruit (77%), vegetable (56%) and dairy products (70%) exchange whereas they had normal intake of oils/fats (95%) and sugars/sweets (97%). This study reveals that the patient suffered from CKD with dialysis phase were observed loss of appetite and inadequate dietary intake than the recommended, lead to malnutrition, susceptible to various life style diseases and high risk of morbidity.

Keywords: Dialysis, inadequate, dietary intake, malnutrition, morbidity.

INTRODUCTION

Chronic kidney disease (CKD) is a most important problem in worldwide and protein-energy malnutrition is frequent in stage 5 chronic kidney disease (CKD) and frequently linked with anorexia, kidney disease wasting (KDW), chronic inflammation, refractory anaemia and deprived outcome including the prone of cardiovascular disease and death^{1,2, 3}. Unlike in developing countries where malnutrition is concurrent with deprived socioeconomic conditions, malnutrition in the developed countries on average occurs in the context of acute or chronic illness⁴.

The dialysis treatment and techniques may also contribute to the protein-energy malnutrition. The term Malnutrition-Inflammation-Cachexia Syndrome (MICS) underscores the close association between the protein-energy malnutrition and inflammation and their concomitant contribution to the Kidney disease wasting (KDW). Dietary supplements and nutritional and pharmacological medications that can encourage appetite, mitigate inflammation and improve protein and energy intake may get better survival in patients with stage 5, CKD although scientific evidence for or against such effects is currently inadequate⁵. Table 1

To recognize dietary habits of individual hemodialysis patients it is necessary to monitor time to time feasibility of food eating pattern and to describe the prescriptive measures for balanced diet^{6,7}. The dietary guideline in CKD patients ensures the suitable way to incorporate all essential nutrients in appropriate amounts^{8, 9}. Patients on dialysis are very sensitive and they need many restrictions which would be helpful to control serum potassium,

phosphorus and interdialytic weight gain to avoid significant complications. Therefore, it is necessary to follow dietary recommendations and a balanced diet¹⁰.

MATERIALS AND METHODS

In the present research longitudinal study was carried out in the hemodialysis unit of Jhansi (U.P.) during the period of April 2016 to March 2017. The study was started with approval of objective by Research Ethics Committees accordance with International Conference on Harmonisation-Good Clinical Practice (ICH GCP) Guidelines, M.L.B Medical College Jhansi (U.P.)¹¹. The assigned Human Ethical Committee approval number was NO-838/ SURGERY/15. Earlier than consent form was obtained from all CKD patients going through regular dialysis two times a week for almost 3 months. One dialysis procedure lasts for almost three hours. The selected haemodialysis patients should be free from any other metabolic disorders like thyroid, diabetes, tuberculosis, cancer etc¹².

These above mentioned criteria lead to the selection of an initial sample of 50 individuals, and further two samples were excluded as they were under-reporting on energy intake, finally, the total sample left was of 48 individuals. Transformation of dietary intake was into eight food groups (cereals, beans, fruits, vegetables, meat and eggs, and greens, milk and its products, oils and fats, sugars). The 24 dietary recall methods we recorded all hemodialysis patients dietary intake and measurement all macronutrients consumptions in eight groups compared with previous recommended dietary intake for dialysis patients that is necessary for a healthy diet¹³.

Nutrients use for calories per kilogram, proteins per kilogram, cereals, beans, meat and eggs, vegetables and greens, fruits, milk and its products, dietary intake below the recommended amount was considered to be inadequate^{14,15}. For analysis, all the statistical data was recorded in Microsoft Excel programme. One way ANOVA was used to perform the comparison between three groups by non-parametric analysis in Graph Pad Prism 7 software.

RESULTS

Finally, the results were analysed for 48 chronic renal failures patients' undergone haemodialysis and the majority of them were male.

Table- 2 demonstrates the obtained results on energy intake, macronutrients and biochemical parameters among the targeted CKD patients. The average energy intake was 1580.5±164 kcal/day, energy intake continues to reduce first month mean 1642.7±148.9 and the second month was 1474±141.9, protein average intake was 54.0±4.8, carbohydrate intake was 204.3±19.0, fat visible and non visible intake was 49.0±4.6. The entire macronutrients intake was lower than the previous month. Such type of inadequate dietary intake might be due to loss of appetite or some other emotional and metabolic stress^{16, 17}.

In table -3 the nutritional assessment CKD -5 patients were carried out by 24 dietary recall methods^{18, 19}. The patients underwent hemodialysis information about food intake from a different food group. Mean value of three months showed low intake of cereal (75%), bean and pulse (45%), fruits (77%), milk (70%), meat (29 %) and sugar (98%), oil or fat (95%) almost near recommended quantity.

DISCUSSION

Patients on haemodialysis usually have poor dietary habits along with loss of appetite, due alteration of sensory and taste perception is common among haemodialysis (HD) patients

as they prefer oily or deep fried foods, high concentration of sugar and less eating of fruits, green vegetables and sugar^{20,21}. The study concludes that the diet in HD dietary patterns and nutritional intake are associated with mortality and hospitalisation in adults with end-stage kidney disease treated with haemodialysis²². The patient's ingestion of macronutrients like calories, proteins, carbohydrate and very limited amount micronutrients (B -Complex group vitamins) food sources like vegetable and milk²³.

Protein-energy malnutrition is a type of malnutrition in which the individual does not intake enough of the macronutrients (calories) in the variety of proteins like meat and legumes (1.2 g/kg body weight) they taking excessively of the macronutrients in the variety of carbohydrates. It may happen even when a person's on the whole macronutrient (energy) intake is adequate, means they are taking 35 kcal/kg body weight if they are <60 years or 30 kcal/kg body weight if patients are >60 years⁷.

The protein-energy undernourishment in people being cured with continuation dialysis is different including the decline in dietary protein and on the whole energy intake²². Protein consumption may be limited for the reason that higher intake of protein requires a higher number of dialysis¹⁶. It is remarkable that a poorer intake of protein with adequate energy intake have needs of lower doses of dialysis.

Dialysis patients do not have proper awareness about their diet and nutrition. Therefore dialysis patients necessitate time to time diet counselling^{23, 24}.

Patients on dialysis may not be aware of the recommended energy and protein intake unless they receive nutritional counselling from a health professional²⁵. It is essential for people who are on dialysis to admittance to nutritional psychotherapy so they are aware of the importance of different foods groups and the variety of nutrients they can add or limited in their dietary intake¹⁷.

Table 1: Recommended dietary nutrient intake for hemodialysis patients

Nutrients	Recommended intake
Dietary protein intake (DPI)	• 1.2 g/kg/d for clinically stable patients (at least 50% should be of high biological value)
Daily energy intake (DEI)	• 35 kcal/kg/d if <60 years • 30-35 kcal/kg/d if 60 years or older
Total fat	25-35% of total energy intake
Saturated fat	<7% of total energy intake
Polyunsaturated fatty acids	Up to 10% of total calories
Carbohydrate	Rest of calories (complex carbohydrates preferred)
Total fiber	">20-25 g/d
Sodium	750-2000 mg/d
Potassium	2000-2750 mg/d
Phosphorus	800-1000 mg/d
Calcium	<1000 mg/d
Iron	10-18 mg/d
Water	Usually 750-1500 ml/day

DPI: Dietary protein intake, DEI: Daily energy intake, HD: Hemodialysis.
Source-Recommended Dietary intake for hemodialysis (Therrien, 2015)⁶

Table 2: Nutritional assessments of CKD Patients

Nutritional assessment Tests Of CKD Patients	Mean ± SD Of CKD Patients Undergone Hemodialysis First month	Mean ± Of CKD Patients Undergone Hemodialysis Second month	Mean ± SD Of CKD Patients Undergone Hemodialysis Third month	Mean ± SD Of CKD Patients Undergone Hemodialysis (mean of three months)	P Value (Anova test)	Statistically Significant (P < 0.05)
Weight (Kg)	57.7±6.1	57.6±5.7	56.7±5.4	57.38±5.5	<0.6	No
BMI	21.9±1.4	21.9±1.7	21.6±1.6	21.6±1.8	<0.4	No
MUAC (cm)	23.5±1.6	22.4±1.3	21.8±1.8	22.18±1.47	<0.0001	Yes
Rbs (fasting)	110.8±15.9	109.1±13.8	114.1±15.1	111.4±11.7	<0.2	No
Hb(mg/dl)	7.4±1.5	8.3±1.21	8±0.9	7.9±0.9	<0.002	Yes
S. Cholesterol (mg/dl)	169.2±32.8	190.7±31.2	202.5±28.1	187.5±28.1	<0.0001	Yes
S.Albumin (mg/dl)	3.3±0.5	3.5±0.5	3.3±0.6	3.4±0.5	<0.02	Yes
Energy(Kcal)	1642.7±148.9	1474±141.9	1372.7±144.2	1580.5±164	<0.0001	Yes
Protein (gm/day)	60.7±5.14	53.6±5.6	47.6±5.4	54.0±4.8	<0.0001	Yes
Fat (gm/day)	50.9±6.9	51.3±5.2	46±5.3	49.0±4.6	<0.0001	Yes
Carbohydrate (g m/day)	228.0±25.3	202.0±19.4	183.0±19.2	204.3±19.0	<0.0001	Yes

(S.albumin- serum albumin, MUAC- Mid-Upper Arm Circumference, Kcal- kilocalorie.)

Table 3: Intakes of macronutrients among hemodialysis patients.

Food group (n=48)	n (%)	Recommendation
Cereals		6 portions
Adequate	12(25)	
Inadequate	36(75)	
Beans		1 portion
Adequate	26(54.1)	
Inadequate	22(45.8)	
Meat and eggs		1 portion
Adequate	34(70.83)	
Inadequate	14(29.1)	
Fruit		3 portions
Adequate	9(18.75)	
Inadequate	37(77.08)	
Vegetables and greens		3 portions
Adequate	21(43.7)	
Inadequate	27(56.2)	
Milk and derivatives		3 portions
Adequate	14(29.1)	
Inadequate	34(70.8)	
Oils and fats		Up to 1 portion
Adequate	46(95.8)	
Inadequate	2(4.1)	
Sugars		Up to 1 portion
Adequate	47(97.8)	
Inadequate	1(2.08)	

Source-Food intake in patients on hemodialysis, Vaz et al. (2014)¹⁸.

CONCLUSION

From the results mentioned above, it is analysed that patients of CKD with regular dialysis and long term haemodialysis fails to make it free from CKD-related undernutrition. HD durations were correlated with long term decrease in ingestion of total energy and protein. It was observed that there is a significant inadequacy in terms of quantitative and qualitative food intake when the comparison was made with the precise recommendation of KDOQI guidelines. The studied group of chronic renal failure patients were seen to have an imbalance diet and consumption of fewer amounts of retinol, iron, fruits, vegetables, milk and milk products.

ACKNOWLEDGEMENT

We acknowledge the support and cooperation of the patients enrolled in the study. We also thankful to the staff of the Department of Medicine and Dialysis unit of MLB Medical College, Jhansi for their valuable help and support.

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Cite this article as:

Neelesh Kumar Maurya *et al.* Dietary intake and nutritional status in hemodialysis patients. *Int. Res. J. Pharm.* 2019;10(4):102-105
<http://dx.doi.org/10.7897/2230-8407.1004132>

Source of support: Nil, Conflict of interest: None Declared

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