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Assessment of nutritional status of heamodialysis patients in Raipur City

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ABSTRACT

Malnutrition is common in dialysis patients and closely related to morbidity and mortality. The quantitative research study focused on investigating the nutritional status on their quality of life This study was designed for a period of 3 months to assess the nutritional status of 40 dialysis patients between age group of age 25 to 65 years participated in a detailed anthropometrics assessment was also done height, dry weight from the previous dialysis treatment, body mass index (BMI) as well as mid upper arm circumference. Lastly, a 24-hour dietary recall was taken. The result revealed that, 20 % patients were seen in age group of 55-65 years, 10% patients were seen in active age group of 25-35 years and 40% patients was seen for 45-55 years, remaining 30% patients were found 35-45 years. The majority of patients were male 28 (70%) and 12 (30%) were female. Mean weight, body mass index (BMI) and mid upper arm circumference were 57.03 kg±10.17 kg, 21.96±2.97 kg/m^2 and 21.89±3.72 cm. Mean daily calorie, protein, fat and carbohydrate intake was 1571 ± 214.14 kcal/day, 47.50±7.59 g/day, 27.2 ± 6.36 g/day and 169±32.46 g/day, respectively. Conclusion regular nutritional screening, assessment, diet consultation and follow-up would bring a positive impact on such patient population as it could guide them through appropriate nutritional modification.

Key Words : Heamodialysis, BMI, MUAC

INTRODUCTION

Maintenance haemodialysis (MHD) patients are at increased risk for abnormal nutritional status due to numerous causative factors both nutritional and non nutritional. Protein energy wasting is independent factor associated with high mortality in MHD patients. In haemodialysis patients (HDP), it is important to perform an early diagnosis of malnutrition (MN) and inflammation, which are represented by protein-energy wasting (PEW) as they are significant predictors of mortality (Fouque *et al.,* 2008, Dekker *et al.,* 2016, Dekker *et al.,* 2018), using the best clinically available tools to create specific nutritional strategies that can predict outcomes, evaluate therapeutic responses, and avoid severe nutritional deterioration. This adds to the importance and significance of the presence of nutrition specialists in HD centre for early detection of malnutrition and strategies to be implemented to prevent further deterioration (Hand and Burrowes, 2015).

The first is related to low protein and energy intake. In this context, co-morbid conditions are uncommon and serum albumin may be normal or only slightly decreased. This type of malnutrition may be amenable to adequate nutritional and dialysis support. In contrast, the second type of malnutrition is associated with inflammation and atherosclerotic cardiovascular disease (MIA syndrome). Co-morbid conditions are common and serum albumin levels are usually decreased. This type of malnutrition is much more difficult to reverse with nutritional support and dialysis therapy, unless the underlying co-morbid conditions and chronic inflammatory response are adequately treated (Stenvinkel *et al.,* 2000). Obviously, these two types of malnutrition are often combined in the clinical setting.

This physiological and psychosocial vulnerability differentiates them from young dialysis patients. The prevalence of protein-energy malnutrition is highly variable

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in this group of patients, ranging from 26% to 77% (De Oliveira Santin *et al.,* 2016). This deviation is linked to a lack of consensus on the definition and evaluation methods of the protein-energy wasting syndrome (Johansson *et al.,* 2017).

The information available about nutritional status of dialysis patients and prevalence of malnutrition in these patients in India is very little. Therefore, this study was carried out to assess the nutritional status of the dialysis patients in the NH MMI hospital, Raipur (C.G.) because in this study patients came from all over Chhattisgarh, so maybe this study will be helpful in academics to know the prevalence of malnutrition, cause and factors affecting the nutritional status of dialysis patients and how nutritional status will improve.

Objectives of the study:

1. To assess the nutritional status of the patients by anthropometrically.
2. To assess the nutritional status of patients by three days dietary recall methods.

Hypothesis:

1. There is no relationship between nutritional status of hemodialysis and anthropometric parameters.
2. There is no relationship between nutritional status of hemodialysis and dietary assessments .

METHODOLOGY

In the present study, purposive sampling technique was used for the sample selection. The study was designed for a period of 3 months to assess the nutritional status of 40 dialysis patients between age group of age 25 to 65 years in NH MMI Hospital Raipur (C.G.).

Inclusion criteria for sampling:

1. Consent to participate in this study.
2. Hemodialysis twice and three times per week
3. Anuric
4. Patients with no acute illness, such as pneumonia, acute myocardial infarction or septicemia.

All patients were informed about the nature of the study.

Exclusion criteria for sampling:

1. Patient not willing to participate.
2. Admitted patients, who were taking dialysis for conservative management only.
3. Patients going for peritoneal dialysis.

Tools and techniques:

The information of the present study was collected with the help of 'Questionnaire cum Interview Techniques'. The interview schedule was prepared to include all possible questions relevant to the objective of the study. It was prepared in English language and translated into local language.

General information:

A questionnaire was used to collect the following data from each participant: name, age, gender, dietary habits and medical history including diagnosis, duration and frequency of dialysis.

Anthropometric assessment:

Anthropometric measurements are valid and clinically useful indicators of the protein –energy nutritional status in maintenance dialysis (MH) patients. These measurements include percent usual body weight, percent standard body weight, body mass index and mid upper arm circumference were measured

Dietary assessment:

Various food items consumed by the subjects during breakfast, lunch, evening tea and dinner were carefully documented with their actual measurements in this section.

Questionnaire was given to the patients Anthropometrics assessment was also done height, dry weight from the previous dialysis treatment, body mass index (BMI) as well as mid upper arm circumference (MUAC). Lastly, a 24-hour dietary recall was obtained from the patient and recorded on a food data sheet. All variables including anthropometric and dietary variables which is used for study was given below:

Dry weight (Wt.):

Dry weight in dialyzed patient is the weight at the end of dialysis treatment. Electronic weighing machine was used to obtain the weight. Patients are asked to remove their shoes and heavy garments. Weight was measured in all patients and taken to the nearest 0.1 kg using weighing scale.

Height (Ht.):

Height was measured in all patients, with the patients

bare footed and head upright. The height is measured with the measuring rod attached to the balanced beam scale. The floor surface next to the height rule was hard. The height was reported to the nearest 0.5 cm.

Body Mass Index (BMI):

BMI was used to assess the degree of malnutrition.. The BMI was calculated according to the patient's post-dialysis weight (kg) divided by height in (meter) squared.

Body Mass Index (BMI) = Weight (Kg)/ Height (Meter)

Classification	BMI (kg/m^2)	
	Principal cut-off points	Additional cut-off points
Underweight	**<18.50**	**<18.50**
Severe thinness	<16.00	<16.00
Moderate thinness	<16.00-16.99	<16.00-16.99
Mild thinness	17.00-18.49	17.00-18.49
Normal range	**18.50-24.99**	**18.50-22.99**
		23.00-24.99
Overweight	**≥25.00**	**≥25.00**
Pre-obese	25.00 – 29.99	25.00 – 27.49
		27.50 – 29.99
Obese	**≥30.00**	**≥30.00**
Obese class I	30.00 – 34.99	30.00-32.49
		32.50 – 34.99
Obese class II	35.00 – 39.99	35.00 – 37.49
		37.50 – 39.99
Obese class III	≥40.00	≥40.00

Source: Adapted from WHO, 1995, WHO, 2000 and WHO 2004

Mid upper arm circumference (MUAC):

A narrow flexible, non-elastic tape was used to measure the mid upper arm circumference (MUAC), The measurements were made to the nearest 0.1 cm.

Dietary assessment:

Food consumption pattern was assessed on consecutive 3 days dietary recall method. A set of standardized vessels were used to obtain estimates of the amount of raw and cooked food consumed by the patients. 3 days dietary record was completed by the patient or one of his relatives. The patient or his relative was instructed on the recording method by using the house hold measurements. The National Kidney Foundation (Kidney Disease Outcomes Quality Initiatives) (NKF-K/DOQI), adopted to decide the dietary requirement of their maintenance hemodialysis.

KDOQI Guidelines for nutrient needs in hemodialysis Nutrients	Hemodialysis
Protein (>/=50% HBV protein)	1.2 g/kg
Energy	35 kcal/kg <60 years
	30-35kcal/kg>60 years
Sodium	2g/day
Potassium	2–3g Monitor serum levels
Fluid	As per 24 urine output

Statistical analysis:

The static analysis of data was entered into the computer using MS-Excel program. Mean and standard deviations for various parameters was computed.

RESULTS AND DISCUSSION

General information:

Total 40 maintenance hemodialysis were selected for the study, 20 % patients were seen in age group of 55-65 years, 10% patients were seen in active age group of 25-35 years and 40% patients was seen for 45-55 years, remaining 30% patients were found 35-45 years. The majority of patients were male 28 (70%) and 12 (30%) were female.

Table 1.1: Distribution of hemodialysis patients according to their demographic characteristics

Measure	Categories	N=40	F in %
Age	25-35	5	10
	35-45	10	30
	45-55	14	40
	55-65	11	20
Sex	Female	12	30
	Male	28	70

The overall hemodialysis patients (35%) were diagnosed with End Stage of Renal Disease with hypertension, 15 % were converted to acute on chronic renal failure and 50 % were diagnosed with diabetic kidney disease.

Table 1.2 : Distribution of hemodialysis patients according to diagnosis

Patients diagnosis	F	F in %
Diabetic kidney diseases	20	50
HTN with ESRD	14	35
Acute CRF	6	15

The number of vegetarian patients were 19 (47.5 %), 12 (30%) were found non- vegetarian and 9 (22.5%) were vegetarian but they was taking egg only not chicken and muttons.

Table 1.3 : Distribution of hemodialysis patients according to dietary habits

Dietary habits	F	F in %
Vegetarian	19	47.5
Non vegetarian	12	30
Eggetarian	9	22.5

Dialysis patients distributed in to three groups twice, thrice and weekly.

Majority of the patients 27 (67.5%) were taking dialysis thrice in a week, 7 (17.5%) twice in a week, and minimum patients 6 (15 %) patients taking weekly.

Table 1.4 : Distribution of hemodialysis patients according to frequency dialysis in week

No. of dialysis	F	F in %
Twice	7	17.5
Thrice	27	67.5
Weekly	6	15

Anthropometric assessment:

Mean weight, body mass index (BMI) and mid upper arm circumference were 57.03 kg±10.17 kg, 21.96±2.97 kg/m^2 and 21.89±3.72 cm, respectively.

Table 2.1 : Distribution of the patients according to mean anthropometric variables

Variable	Mean	SD	Minimum	Maximum
Height	160.8	7.55	148	178
Weight	57.03	10.17	38.5	75
BMI	21.96	2.97	17.2	28.1
MUAC	21.89	3.72	17	32.5

Mean daily calorie, protein, fat and carbohydrate intake was 1571 ± 214.14 kcal/day,47.50±7.59 gm/day, 27.2 ±6.36 g/day, 169±32.46 g/day, respectively.

Table 2.2 : Distribution of the patients according to mean intake of nutrients

Nutrient	Mean	SD	Minimum	Maximum
Calorie	1571.95	214.14	1200	2100
Protein	47.5	7.59	35	70
Fat	27.2	6.36	15	45
CHO	169	32.46	140	280

Discussion:

Table 1.1 indicates the demographical characteristics 40 maintenance hemodialysis were selected for the study, 20 % patients were seen in age group of 55-65 years, 10% patients were seen in active age group of 25-35 years and 40% patients was seen for 45-55 years, remaining 30% patients were found 35-45 years. The majority of patients were male 28 (70%) and 12 (30%) were female.

Oliveira *et al.* (2012) evaluated the nutritional status in haemodiabetic patients and reported that there was a significantly increased prevalence of malnutrition among the elderly compared to those younger than 60 years.

Table 1.2 is presented with the diagnosis of selected patients. It was observed most common diagnosis was end stage of Renal Disease with hypertension 14 (35%), followed by acute on CRF 6 (15 %) and diagnosed with diabetic kidney disease 20(50%).

Toto (2005) evidenced high blood pressure to be present in more than 80% of the patients having chronic kidney disease and contributes to headway of kidney disease towards end stage renal disease (Toto, 2005).

Fifty percent of the selected patient was in their suffered diabetic kidney diseases. The etiologies of end stage of renal disease are many but diabetes mellitus is the foremost cause for ESRD, whereas Cano *et al.* (2002). Also in 2001, Jane (2001) indicated on nutritional status and outcome of the diabetic kidney disease. The prevalence of malnutrition is evidently higher in diabetes patients undergoing dialysis than in non-diabetic patients undergoing dialysis and observed diabetes is the most common cause of end-stage renal disease.

Distribution of the patients as per their dietary habits shows in Table 1.3 So many study concluded that during dialysis 10-15 gm of protein loosed, during maintenance hemodialysis required high protein diet and 50 % from high biological of protein, in present study vegetarian patients were higher 19 (47.5 %) than non- vegetarian 12 (30%), for vegetarian patients it was very difficult to get the required protein intake with high biological value. 9 (22.5%) were vegetarian but they were taking egg only.

Table 1.4 shows distribution hemodialysis patients according to duration of dialysis in three groups twice, thrice and weekly. Dialysis patients distributed in majority of the patients 27 (67.5%) were taking dialysis thrice in a week, 7 (17.5%) twice in a week, and minimum patients 6 (15 %) patients taking weekly.

Studied the effect of hemodialysis (HD) duration

on food intake and nutritional markers in patients with chronic kidney disease (CKD) and concluded that the duration of dialysis is an important factor for nutritional status of the patients (Schulman, 2004).

Table 2.1 Distribution of the patients according to mean anthropometric variables. Mean weight, body mass index (BMI) and mid upper arm circumference were 57.03 kg±10.17 kg, 21.96±2.97 kg/m^2 and 21.89±3.72 cm. The WHO regard BMI of less than 18.5 kg/m2 as underweight and may indicate malnutrition, an eating disorder or other health problems, in the present study 8(20%) patients were malnourished and out of these 6(15%) severe and 10(25%) were mild malnourished.

Port *et al.* (2002) investigated interrelation between BMI and survival patients with the lowest BMI had a 42% higher mortality risk than patients in the highest BMI and conclude higher BMI might in turn be an indication of better nutritional status, as biochemical markers of better nutrition co-aggregate with larger body mass.

Saxena and Sharma (2004) observed in their study that anthropometric techniques are more appropriate for epidemiological, clinical or in hospital.

Table 2.2 shows Mean daily calorie, protein, fat and carbohydrate intake was 1571 ± 214.14 kcal/day, 47.50±7.59 g/day, 27.2 ±6.36 g/day, and 169±32.46 g/day, respectively.

Morais *et al.* (2005) showed that MHD patients have an increased incidence of protein energy malnutrition take control the importance of maintaining an adequate nutrient intake. Although there are many causes for malnutrition, decreased nutrient intake is maybe the most important. Causes of poor nutrient intake include anorexia from uremia.

In 2014 Anjali and Veenu Seth founded that the nutritional status of diabetic nephropathy patients undergoing dialysis was very poor because of poor dietary intake and nutritional insufficiency. Stated that each maintenance dialysis patient needs specific nutritional counseling based on an individualized plan of care developed before or at the time of beginning of maintenance dialysis.

Morais *et al.* (2005) measured dietary intake by using a onetime dietary recall which is not very representative of a person's habitual dietary intake. Found a strong correlation between long HD duration and poor nutritional status. In addition, HD is a high catabolic process that promotes a significant loss of essential nutrients, such as amino acids, vitamins, proteins and glucose.

Another important finding in our study that co morbidities were significant predictors of malnutrition in haemodialysis patients. Similar to our study, Jahromi *et al.* (2012) showed that, using Dialysis Malnutrition Score, poor protein and energy intake, co morbidities and inflammation were the predictors of malnutrition in descending order of importance.

A recent study on 13 clinically stable sedentary young hemodialysis patients receiving a constant energy intake showed that daily average energy requirements were 31 ± 3kcal/kg/day with very high variability ranging from 26 to 36 kcal/kg/day (Shah *et al.,* 2016). These results confirm the 35 Kcal/kg/day in patients under 60, as per KDOQI guidelines. On the other hand, the 30 Kcal/kg/day recommended for elderly hemodialysis patients. A personalized nutritional assessment should be made by calculating resting energy expenditure using equations validated with a corrective factor taking into account the level of physical activity and possible aggressions likely to increase energy expenditure (Roza and Shizgal, 1984, Clinical Practice of the SFNEP, 2012). It is known that there is a strong and inverse association between the level of low albumin and a high risk of morbidity and mortality (Cooper *et al.,* 2004).

Conclusion:

In this present study, showed patients undergoing maintenance hemodialysis are wasted or malnourished. MHD patients have a high incidence of protein-energy malnutrition which reflects the importance of maintaining an adequate nutrient intake. Hemodialysis patients and closely related to morbidity and mortality. It was concluded that regular nutritional screening, assessment, required diet and follow-up would bring a positive impact on such patient.

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REFERENCES

Anjali and Seth, V. (2015). The Nutritional Status of Diabetic Nephropathy Patients Undergoing Hemodialysis at New Delhi Hospital, India: A Pilot Study. *Internat. J. Food Sci. Nutri. & Dietetics,* **04**(1) : 178-182.

Cano, N.J., Roth, Hubert, Aparcio, Michel and Azar, Raymond (2002). Malnutrition in hemodialysis diabetic patients: Evaluation and prognostic influence. *Kidney International*, **62** : 593-601.

Clinical Practice of the SFNEP (2012). Adult clinical nutrition issues forinternal and practitioner use (2edn), Feed the sick man, Paris. pp. 7-16

Cooper, B.A., Penne, E.L. and Bartlett, L.H. (2004). Protein malnutrition and hypoalbuminemia as predictors of vascular events and mortality in ESRD. *Am. J. Kidney Dis.,* **43**: 61-66.

Dekker, M.J., Marcelli, D., Canaud, B., Konings, C.J., Leunissen, K.M., Levin, N.W., Carioni, P., Maheshwari, V., Raimann, J.G., van der Sande, F.M. *et al.* (2016). Unraveling the relationship between mortality, hyponatremia, inflammation and malnutrition in hemodialysis patients: results from the international MONDO initiative. *Eur. J. Clin. Nutr.*, **70**(7):779–84.

Dekker, M.J.E., Konings, C., Canaud, B., van der Sande, F.M., Stuard, S., Raimann, J.G., Ozturk, E., Usvyat, L., Kotanko, P. and Kooman, J.P. (2018). Interactions between malnutrition, inflammation, and fluid overload and their associations with survival in prevalent hemodialysis patients. *J. Ren. Nutr.*, **28**(6):435–44.

De Oliveira Santin, F.G., Bigogno, F.G. and Dias Rodrigues, J.C. (2016). Concurrent and predictivevalidity of composite methods to assess nutritiona lstatus in older adults on hemodialysis. *J. Ren. Nutr.,* **26**: 18-25.

Fouque, D., Kalantar-Zadeh, K., Kopple, J., Cano, N., Chauveau, P., Cuppari, L., Franch, H., Guarnieri, G., Ikizler, T.A., Kaysen, G. *et al.* (2008). A proposed nomenclature and diagnostic criteria for protein-energy wasting in acute and chronic kidney disease. *Kidney Int.,* **73**(4) : 391–8.

Hand, R.K. and Burrowes, J.D. (2015). Renal Dietitians' perceptions of roles and responsibilities in outpatient Dialysis facilities. *J. Ren. Nutr.*, **25**(5):404–11.

Jahromi, S.R., Hosseini, S., Razeghi, E., Meysamie, A. and Sadrzadeh, H. (2010). Malnutrition predicting factors in hemodialysis patients. *Saudi J. Kidney Dis. Transpl.,* **21**(5) : 846–51.

Jane, A. Lawson (2001). Prevalence and Prognostic Significance of Malnutrition in Chronic Renal Insufficiency. *J. Renal Nutri,* **11** (1) : 16-22.

Johansson, L., Fouque, D., Bellizzi, V., Chauveau, P., Kolko, A. *et al.* (2017). As we grow old: nutritional considerations for older patients on dialysis. *Nephrol Dial Transplant,* **32** : 1127-1136

K/DOQI National Kidney Foundation. Clinical Practice Guidelines for nutrition in chronic renal failure. Am J Kidney Dis 2000;35(suppl. 2): s1-s140. Available at www.kidney.org/Professionals/kdoqi/guidelines_ updates.

Morais, A.A.C., Silva, M.A.T., Faintuch, J., Vidigal, E.J., Costa, R.A., Lyrio, D.C. *et al.* (2005). Correlation of nutritional status and food intake in hemodialysis patients. *Clinics*, **60**(3):185-92.

Oliveira, G.T., Andrade, E.I., Acurcio Fde, A., Cherchiglia, M.L. and Correia, M.I. (2012). Nutritional assessment of patients undergoing hemodialysis at dialysis centers in Belo Horizonte, MG, Brazil. *Rev Assoc Med Bras* (1992). **58** (2) : 240–7.

Port, F.K., Ashby, V.B., Dhingra, R.K., Roys, E.C. and Wolfe, R.A. (2003). Dialysis dose and body mass index are strongly associated with survival in hemodialysis patients. *J. Am. Soc. Nephrol.,* **13** : 1061–1066.

Roza, A.M. and Shizgal, H.M. (1984). The Harris Benedict equation revaluted resting energy requirements and the body cell mass. *Am. J. Clin. Nutr.,* **40**:168-182.

Saxena, A. and Sharma, R.K. (2004). An update on methods for assessment of nutritional status in maintenance dialysis patients. *Indian J. Nephrol.,* **14**: 61-66.

Schulman G. (2004). The dose of dialysis in hemodialysis patients: impact on nutrition. *Semin Dial.,* **17**(6):479-88.

Shah, A., Bross, R. and Shapiro, B.B. (2016). Dietary energy requirements in relatively healthy maintenance hemodialysis patients estimated from long-term metabolic studies. *Am. J. Clin. Nutr.,* **103**: 757-765.

Stenvinkel, P., Heimbürger, O., Lindholm, B., Kaysen, G.A. and Bergström, J. (2000). Are there two types of malnutrition in chronic renal failure? *Nephrol Dial Transplant,* **15**: 953–960

Toto, R.D. (2005). Treatment of hypertension in chronic kidney disease.*Seminars in Nephrology*, **25**(6):435-9.

WHO Expert Consultation (2004). Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. *Lancet*, **10**;363(9403): 157-63.

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