International Journal of Advances in Medicine
Nagabhushana S et al. Int J Adv Med. 2017 Aug;4(4):907-910
http://www.ijmedicine.com
pISSN 2349-3925 | eISSN 2349-3933
DOI: http://dx.doi.org/10.18203/2349-3933.ijam20172623

Original Research Article

Evaluation of nutritional status in chronic kidney disease patients undergoing hemodialysis

Nagabhushana S., Ranganatha M.*, Ranjith Kumar G. K., Virupakshappa

Department of General Medicine, Shimoga Institute of Medical Science (SIMS), Shimoga, Karnataka, India

Received: 02 June 2017
Accepted: 12 June 2017

***Correspondence:**
Dr. Ranganatha M.,
E-mail: dr. mranganth@gmail.com

ABSTRACT

Background: Kidneys perform the important function of excreting nitrogenous waste products and regulating the volume and composition of body fluids. Malnutrition is common phenomenon in maintenance dialysis patients and risk factor for poor quality of life and increased morbidity and mortality. An association of low albumin levels with increased mortality and morbidity in hemodialysis patients has been hypothesized. Present study aims to go through nutritional status of CKD patients in our institute and their relation to disease or dialysis outcome.
Methods: Study is conducted on 100 CKD patients on haemodialysis admitted in various medical wards of the Mc Gann hospital attached to Shimoga institute of medical sciences, Shimoga, Karnataka, India. From August 1st, 2016 to April 30th, 2017 detailed history was taken in all the patients and a thorough physical examination was done. Dietary history was taken and blood is collected for analysis of Hb, blood urea, SR electrolyte, serum calcium, phosphorus, serum albumin, cholesterol, creatinine and CRP. BMI is calculated in all patients.
Results: There were 60 males and 40 females. Average age is 46±3.6 years. Most of these patients belong to the age group of 41-50 years (37%). According to WHO BMI classification 55% had BMI between 18.5 to 24.9. 17% less than 18.5. 13% more than 30BMI. Blood urea, serum creatinine was elevated as expected. Mean Hb is 8.21±2.57 gm/dl. Serum albumin is lower mean being 2.66±1.86 gm/dl. CRP elevated 16.5±2.36. low calcium is also seen.
Conclusions: The malnutrition in CKD is associated with increased morbidity and mortality rates. Despite the better understanding of the pathophysiologic mechanisms of uremic malnutrition and the improvements made in nutritional support, the nutritional condition of CKD and ESRD patients remains a significant cause for concern. Multimodal therapeutic strategies should be considered. Present study showed elevated prevalence of malnutrition in HD subjects. The nutritional status in patients on HD needs more attention. The role of nutrition in the management of CKD is important and needs to be further researched and newer guidelines are need of the hour.

Keywords: CKD, Dietary advice, Haemodialysis, Malnutrition, Serum albumin

INTRODUCTION

Kidneys perform the important function of excreting nitrogenous waste products and regulating the volume and composition of body fluids. When kidney function is impaired, these functions are affected. Many complications are observed in hemodialysed patients during dialysis such as, hemorrhage, cardiac arrhythmia, air embolism, hypertension, malnutrition.[1] Malnutrition is common phenomenon in maintenance dialysis patients and risk factor for poor quality of life and increased morbidity and mortality. In dietary modification, protein restriction, which was once the main modification for patients with CKD is now of debatable value. The KDOQI guidelines on nutrition have not been updated since 2002.[2] The cause of malnutrition in dialysis patients is not very clear, but some probable causes are inadequate nutrient intake, anorexia, dietary restrictions, nutrient

losses during dialysis, hyper catabolism caused by comorbid illness or associated with dialysis treatment, endocrine disorders of uremia etc.[3] Serum albumin is commonly used as indicator of malnutrition in dialysis patients. An association of low albumin levels with increased mortality and morbidity in hemodialysis patients has been hypothesized.[4,5] Poor nutritional status at the start of the dialysis is associated with undesirable outcome.[6-8] In CKD, nutrition and diet play an important role both in prevention of disease progression and in symptom management. Nutritional management of CKD patient is an enigma with lot of controversies and recommendation. Current study aims to go through nutritional status of CKD patients in our institute and their relation to disease or dialysis outcome

METHODS

Study is conducted on 100 consecutive patients admitted in various medical wards of the Mc Gann Hospital attached to Shimoga institute of medical sciences, Shimoga, Karnataka, India, From August 1st, 2016 to April 30th 2017.

Inclusion criteria

All CKD patients aged between 15 to 70 years on haemodialysis.

Exclusion criteria

Persons with chronic liver disease, CCF, Malignancy and tuberculosis were excluded from the study.

Method of the study was 100 consecutive patients admitted in various medical wards of the Mc Gann Hospital attached to Shimoga institute of medical sciences, Shimoga, Karnataka, India with CKD on haemodialysis fulfilling the inclusion and exclusion criteria were taken into study after obtaining written informed consent. In all these patients, detailed clinical history and detailed clinical examination was carried out. For dietary assessment, each patient was interviewed for the consumption of food and beverages using 24-hour recall method and food frequency. The responses were recorded. The portion sizes of foods consumed by each patient were converted into percent CHO, fats, proteins and kcal. Informed consent was obtained from all the subjects. 5ml venous blood was collected in fasting state obtained serum/ blood was analyzed for Hb, blood urea, serum electrolyte, serum calcium, phosphorus, Serum Albumin, Cholesterol, Creatinine and CRP. BMI is calculated in all patients.

RESULTS

100 consecutive patients with CKD on Haemodialysis were studied from August 1st 2016 to April 30th 2017. There were 60 males and 40 females.

Table 1: Sex distribution of patients.

Sex	No. of patients	Percentage
Male	60	60
Female	40	40

The male to female ratio is 1.3:1.

The mean age was 50±1.12 years. The mean age among men was 44.22±9 .72 years and in women was 46.45± 8.61 years. Majority of the patients were in the age group of 40-50 years (Table 1). The male to female ratio was 1.2:1.

Table 2: Age distribution of patients.

Age group	No. of patients	Percentage
15-20	4	4
21-30	7	7
31-40	22	22
41-50	37	37
51-60	18	18
61-70	12	12

Average age is 46±3.6 years. The majority of these patients belong to the age group of 41-50 years. The highest number of cases (37%) was from the age group of 41 to 50 years.

Table 3: Post-dialysis BMI.

Age group	Ranges	Number	Percentage
Post-dialysis BMI	<18.5	17	17
	18.5-24.9	55	55
	25-29.9	15	15
	30-34.9	6	6
	35-39.9	4	4
	40 & >	3	3

Table 4: Mean and standard deviation of biochemical tests.

	(Mean± SD)
Urea (mg/dl)	129.34±22.63
Creatinine (mg/dl)	12.61±4.38
Sodium (mmol/l)	134.01±3.77
Potassium (mmol/l)	5.52±1.4
Chloride (mmol/l)	103.67±5.68
Hb (g/dl)	8.21±2.57
Calcium (mg/dl)	7.67±2.46
Phosphorous (mg/dl)	5.56±3.45
Albumin (g/dl)	2.66±1.86
CRP	16.5±2.36
Cholesterol	132.45±40.46

Blood urea, serum creatinine was elevated as expected. Mean Hb is 8.21±2.57 gm/dl. Serum albumin is lower mean being 2.66±1.86 gm/dl. CRP elevated 16.5±2.36. Low calcium is also seen.

According to WHO BMI classification 55% had BMI between 18.5 to 24.9. 17% less than 18.5. 13% more than 30 BMI.

DISCUSSION

Study is conducted on 100 consecutive patients admitted in various medical wards of the Mc Gann Hospital attached to Shimoga institute of medical sciences, Shimoga. From August 1st 2016 to April 30th 2017. is discussed here and the results have been compared with other studies.

Sex

There were 60 males (60%) and 40 females (40%) in the present study. The male to female ratio was 1.2:1. This finding is consistent with that of Shalabia El-Sayead Abozead et al 62.2% males and 37.8% females with a ratio of 1.6:1 and in study by Bibi Hajira et al it is 69.7% males and 30.3 % females.[9,10]

Age

The age distribution of these patients ranged from 15 years to 70 years with maximum number of patients in the age group 41 to 50 years. There were 37% of patients in this age group. Average age is 46±3.6 years. This is similar to study done by Hajira B et al and El-Sayead Abozead S et al.[9,10] In study by Adithya BR et al showed average of 38.11±11.6 years.[11]

40% of Patients in present study are on haemodialysis more than 4 years others are less than 4 years on haemodialysis. 60% of our patients are following dietary regime and doing protein and water restriction. In the study done by El-Sayead Abozead S et al which showed 46% are on haemodialysis between 1 to 5 years. Only 76.8% were following dietary regimen.[9]

Symptomatology

BMI

According to WHO BMI classification 55% had BMI between 18.5 to 24.9. 17% less than 18.5. 13% more than 30 BMI. Patient BMI less than 25 are at increased risk of malnutrition. About 55% of patients in this study have a BMI of less than 25, a result that suggest a high risk of mortality and morbidity. In a Brazilian cohort of hemodialysis patients Mafra et al confirmed both low BMI (<19 kg/m2) and hypoalbuminemia as a strong predictive of death.[12]

Fleischmann et al studied the influence of excess weight on mortality and hospital stay in 1346 hemodialysis patients and reported that overweight and obese patients (BMI ≥ 27.5) had a significantly better 12-months survival than underweight ones (BMI <20) and patients with normal weight (BMI 20–27.5).[13] Most of the studies showed better prognosis with higher BMI compared lower BMI less than 23.

Table 5: Mean and standard deviation of biochemical tests.

(Mean± SD)	In present study	Azar AT et al[14]	Adithya BR et al[11]	El-Sayead AS et al[9]	Hajira B et al[10]	Alvarez-Ude F et al[15]
Urea (mg/dl)	129.34±22.63	-	134.06±20.08	127.10±20.21	202.22±46.93	186±39
Creatinine (mg/dl)	12.61±4.38	-	11.32±3.33	5.89 ±3.67	11.41±4.68	9.6±2.2
Sodium (mmol/l)	134.01±3.77	-	-	-	135.1±5.68	-
Potassium (mmol/l)	5.52±1.4	-	-	-	5.02±1.0	-
Chloride (mmol/l)	103.67±5.68	-	-	-	102.52±5.28	-
Hb (g/dl)	8.21±2.57	8.45±1.424	-	-	9.21±1.89	-
Calcium (mg/dl)	7.67±2.46	8.56±1.02	-	-	7.79±2.10	-
Phosphorous (mg/dl)	5.56±3.45	5.93±1.943	-	-	7.58±4.04	-
Albumin (g/dl)	2.66±1.86	3.218±0.380	3.1± 0.33	3.28 ±0.86	6.4±4.73	4.14±0.31
CRP	16.5±2.36	-	1.04±0.80	-	-	17.3±2.5
Cholesterol	132.45±40.46	-	155.83±36.71	81.32±17.47	-	176±35

Comparison between various studies show there is similar levels in blood urea and haemoglobin, serum albumin is bit lower in present study compared to other studies indicating higher incidence of malnutrition in our group. Patient with low albumin and BMI showed higher incidence of infections and hospital admissions in present study. Anthropometric and biochemical signs of malnutrition in HD patients are associated with increased mortality, but malnutrition per se is generally not recognized as a common cause of death as reflected by health statistics, except in the oldest age groups. A low serum albumin level is an especially strong predictive risk factor; it may, however, not only or mainly reflect protein malnutrition, but also the influence of several other morbidity factors (overhydration, infection, chronic disease and others) that may entail an increased risk of

death. Anorexia and malnutrition may be related to underdialysis, but the causative role of uremia, uncorrected by the dialysis treatment, is not well defined. Since many of our patients receive only twice weekly haemodialysis due to economic reasons underdialysis may be one of the causes for malnutrition. Many of our patients are not following any dietary advice (up to 40%). For the prevention and treatment of HD-associated malnutrition, it is important to correct factors that may suppress appetite and increase net protein catabolism. The study shows more patients on hemodialysis were at risk of malnutrition higher prevalence of anemia (mean Hb 8.21±2.57) and hypoalbuminemia. Elevated CRP maybe it is due to combination of inadequate haemodialysis, inadequate intake, associated chronic diseases and due to poor dietary advice.

CONCLUSION

The malnutrition in CKD is associated with increased morbidity and mortality rates. Therefore, it is vital to identify, treat and prevent conditions associated with poor clinical outcomes. Despite the better understanding of the pathophysiologic mechanisms of uremic malnutrition and the improvements made in nutritional support, the nutritional condition of CKD and ESRD patients remains a significant cause for concern. Multimodal therapeutic strategies should be considered. Present study showed elevated prevalence of malnutrition in HD subjects. The nutritional status in patients on HD needs more attention. The role of nutrition in the management of CKD is important and needs to be further researched and newer guidelines are need of the hour.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Goddard J, Turner AN, Stewart LH. Chronic kidney disease. Principles Practice Med. 2010;21:487-93.
2. National kidney foundation. Clinical practice guidelines for nutrition in chronic renal failure. Am J Kidney Dis. 2000;35:S1-140.
3. Kalantar-Zadeh K, Ikizler TA, Block G, Avram MM, Kopple JD. Malnutrition-inflammation complex syndrome in dialysis patients: causes and consequences. AMJ Kidney Dis. 2003;42:864-81.
4. Marckmann. Nutritional status and mortality of patients in regular dialysis therapy. J Int Med. 1989;226:429-32.
5. Lowrie EG, Huang WH, Lew NL. Death risk predictors among peritoneal dialysis and hemodialysis patients: a preliminary comparison. Am J Kidney Dis. 1995;26:220-8.
6. Adequacy of dialysis and nutrition in continuous peritoneal dialysis: association with clinical outcomes, Canada-USA (CANUSA) peritoneal dialysis study group. J Am Soc Nephrol. 1996;7(2):198-207.
7. Stenvikel P, Barany P, Chung SH, Lindholm B, Heimburger O. A comparative analysis of nutritional parameters as predictors of outcome in male and female ESRD patients. Nephrol Dial Transplant. 2002:17(7):1266-74.
8. De Araujo IC, Kamimura MA, Draibe SA, Canziani ME, Manfredi SR, Avesani CM, et al. Nutritional parameters and mortality in incident hemodialysi patients. J Ren Nutr. 2006;16(1):27-35.
9. El-Sayead AS, Ahmed AM, Mahmoud MA. Nutritional status and malnutrition prevalence among maintenance hemodialysis patients. IOSR JNHS. 2015;4(4):1940-2320.
10. Hajira B, Samiullah M, Chawla RK. Nutritional status assessment of hemodialysis patients at Rehman medical institute Peshawar. APRN J Agricultural Biological Sci. 2013;8(4):329-36.
11. Adithya BR, Sangeeta S, Sunanda V, Priya SH, Prakash G. A study on biochemical parameters of malnutrition in chronic kidney disease patients undergoing hemodialysis. J Evolution Medi Denta Sci. 2015;4(84):14721-5.
12. Mafra D, Farage NE, Azevedo DL, Viana GG, Mattos JP, Velarde LG, et al. Impact of serum albumin and body-mass index on survival in hemodialysis patients. Int Urol Nephrol. 2007;39(2):619-24.
13. Fleischmann E, Teal N, Dudley J, May W, Bower JD, Salahudeen AK. Influence of excess weight on mortality and hospital stay in 1346 hemodialysis patients. Kidney Int. 1999;55:1560-7.
14. Azar AT, Wahba K, Mohamed AS, Massoud WA. Association between dialysis dose improvement and nutritional status among hemodialysis patients. Am J Nephrol. 2007;27:113-9.
15. Alvarez-ude F, Fernandez-reyes MJ, Sanchez R, Mon C, Iglesias P, Vazquez A. Nutritional status, comorbidity and inflammation in hemodialysis. Nephrol (MADR). 2000;20:540-9.

Cite this article as: Nagabhushana S, Ranganatha M, Ranjith Kumar GK, Virupakshappa. Evaluation of nutritional status in chronic kidney disease patients undergoing hemodialysis. Int J Adv Med 2017;4:907-10.