Volume : 2 | Issue : 3 | March 2013 • ISSN No 2277 - 8160

Research Paper | Home Science

Assessment of Nutritional Status of Hemodialysis Patients

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ABSTRACT

Chronic Kidney Disease (CKD) is the emerging public health problem in both developed and developing countries. Malnutrition is common among dialysis patients. Depending in part upon the method used and the population studied, from 45 to 65 percent of patients with End-Stage Renal Disease (ESRD) are malnourished. In this study, 90 patients who are initiated with hemodialysis treatment and who are undergoing hemodialysis for the period of two years were selected. The subjective data such as appetite, hunger, and sensation of thirst, urine output, bowel movements, sleep, social habits and physical activity level were also collected to assess their well being. Nutritional status was assessed by anthropometric evaluation of height, weight, BMI, skin fold measurements, biochemical evaluation of serum albumin, clinical evaluation and food frequency evaluation. This study was helpful in identifying etiology of ESRD, nutritional status of hemodialysis patients and thereby paving the way for nutrition intervention to improve their health status.

KEYWORDS: Hemodialysis, Malnutrition, Nutritional status.

Introduction

End stage renal disease (ESRD) is a common and rapidly increasing public health problem all over the world, consuming a bulk of economy in treating these patients (Arikan and Tuglular, 2005). The National and international registries on ESRD and renal replacement therapy (RRT) in developed countries have highlighted the incidence, prevalence, etiology, prognostic factors, survival and mortality of ESRD patients (Stengel et al, 2003 and Wakai et al, 2004). Protein-energy malnutrition (PEM) is common in the haemodialysis population. Identification followed by management of these patients can result in significant reduction in morbidity and mortality (Siddiqui et al, 2007). There is a high prevalence of protein-energy malnutrition in the end-stage renal disease population. Etiology of malnutrition through various reasons in hemodialysis patients are directly linked to the uremic state (Cohen and Kimmel 2007). There are many factors which predispose malnutrition in hemodialysis subjects' namely poor intake, dietary restriction, infection, inflammation, co-morbidities, increased loss of nutrients and increased protein catabolism (Morais, 2005). The main determinants of mortality and morbidity in hemodialysis patients are nutritional status of the patients and dialysis adequacy index (Nunes et al, 2008).

Nutritional assessment is the first step in the treatment of malnutrition. The goals of nutrition asessment are identification of patients who are at risk of developing malnutrition and who already have malnutrition, to quantify a patient's degree of malnutrition and to monitor the adequacy of nutrition therapy.

Need for the study

Depending upon the method used and the population studied, 45 to 65 percent of patients with end-stage renal diseases are malnourished. Complication due to malnutrition that appears is associated with increased mortality in hemodialysis patients. To prevent or reduce the risk of complication, periodic assessment of nutritional status should be part of the routine care of dialysis patients to permit early recognition and the institution of appropriate therapy. There is no single measurement that can be used to determine the presence of malnutrition (Tattershall et al, 2007). The preliminary assessment of nutritional status requires a careful history, a physical examination, and the biochemical evaluation. This assessment helps in determination of the caloric, protein, and fluid needs of the patient. There is a great need to assess the nutritional status of hemodialysis patients to pay the way for early nutrition intervention and nutrition education to improve their health status for well-being.

Nutritional status

Anthropometric data collected was height, weight, Body Mass Index (BMI), Mid Arm Muscle Circumference (MAMC), Mid Arm Circumference (MAC) and Tricep Skin Fold (TSF). The body mass index (BMI) was obtained from height and Post dialysis body mass. The ideal body weight was calculated using Brokas Index Biochemical parameters such as serum urea, creatinine, sodium, lipid profile, potassium, phosphorus, calcium, serum albumin and 25, hydroxycholecalciferol were analysed using auto analyser. The clinical evaluation of presence of eye discolouration, edema, hair loss, skin texture and gastrointestinal symptoms were also observed. The information on dietary intake was assessed using food frequency questionnaire. The physical activity pattern of hemodialysis patients was also obtained.

Attributes	Mean±SD
Total number of patients Male (%) Female (%) Age (years)	90 51 39 48.78±13.8

Table 1
Anthropometric measurements of the selected subjects

Attributes	Mean ±SD
Height (cms) Dry weight (kgs) Body Mass Index (BMI) (kg/m2) Mid Arm Circumference (MAC) (cms) Trisep Skin Fold (TSF) (mms) Mid Arm Muscle Circuference (MAMC)	160.99±13.8 53.96±12.84 20.86±4.27 19.49±4.88 12.44±10.11 15.91±3.92

Dialysis treatment

In this study, sixty three percent of the subjects underwent hemodialysis therapy weeky twice; fifteen percent of the subjects took hemodialysis therapy weekly thrice. High flux polysulphone dialyser was used. The dialysers were reused after processing with renalin (formalin). Thirty four percent of the subjects reused the same dialyser for four times, eighteen percent of the subjects reused for six times, twenty percent reused for five times and nine percert of the subjects used disposable dialysers. Dialysis subjects reported that they reuse dialysers as they are cannot afford new dialysers for each time.

Table 3
Biochemical parameters

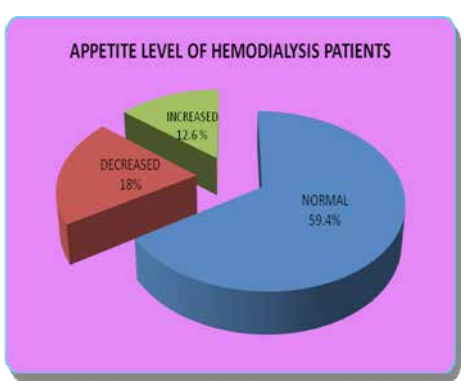
Attributes	Mean ±SD
Serum Urea (mg/dL)	108±29.79
Serum creatinine (mg/dL)	9.03±4.96
Sodium (mEq/dL)	135.96±13.63
Serum Potassium (mEq/dL)	5.44±0.52
Serum phosphorus (mg/dL)	5.62±1.61
Total cholesterol (mg/dL)	135.23±21.83
Triglycerides (mg/dL)	110.32±51.45
HDL (mg/dL)	30.02±4.33
LDL (mg/dL)	83.86±18.61
Serum albumin (mg/dL)	3.87±0.35
Serum bicarbonate (mg/dL)	17.71±9.80
Hemoglobin (mg/dL)	10.31±1.79
25 dihydroxycholecalciferol	15.88±11.43

Results and discussion

From the data obtained, it was found that the past medical history of the subjects who are undergoing hemodialysis had hypertension (27%), Diabetes (24.3%), drug induced renal failure (22%) and idiopathic causes (3.3%). This finding correlates with the findings of Cao et al, 2012 that diabetes and hypertension are the major causative factor for emerginh end stage renal disease if uncontrolled. These patients have the strong family history of diabetes and hypertension. The predominent symptom the dialysis subjects had when they were diagnosed as ESRD was nausea, vomiting, anorexia, pedal edema, back pain, decreased urine output, headache and fever.

Figure 1 given below shows the appetite level of hemodialysis patients in which 59.4 % of the subjects had normal appetite level. More over 48.6% of the subjects have increased thirst sensation which leads to non compliance to fluid restrictions. Noncompliance with fluid restriction may cause a large interdialytic weight gain (IWG) and may lead to chronic fluid overload, resulting in a much greater risk for cardiovascular comorbidity and mortality (Lindberg, 2010).

Figure 1



From the study it was found that sixty one percent of the subjects have normal bowel movements while twenty percent suffered from constipation. Fifty two percent of the subjects do not undergo any physical activity either on dialysis day and non dialysis day due to weekness. This finding parellel with the finding of study Majchrzak et al, 2005 shows that physical activity is lower on dialysis days when compared with nondialysis days and this decrease is caused by the lack of activity during the 4-hour hemodialysis procedure. The other factor for poor of physical activity is due to the unawareness about the beneficial effect of exercise (Bayliss, 2006).

SGA score was calculated based on the history and physical examination as described by Destky et al (1987). The history focused on seven variables of patients namely change in weight in preceding 6 months and two weeks, changes in food intake, presence of gastro intestinal symptoms, changes in functional capacity, muscle wasting, loss of subcutaneous fat and edema. A seven point scoring system was applied to the above 7 variables. SGA scoring details of the selected hemodialysis subjects was summarized in Table 4.

Table 4
SGA statistical analysis

SGA scoring	Degree of malnutrition	No:of subjects (n=90)	Percentage %
1-14	Well nourished	35	38.9
15-35	Moderately malnourished	48	53.3
36-49	Poorly malnourished	7	7.8

From the above table it shown that 39% of the subjects were well nourished with the scorings between 1-14, 53% of the subjects were mild to moderately malnourished with the scorings between 15-35 and 8% of the subjects were severely malnourished with the scorings between 36-49. The status of serum albumin levels of the subjects who participated in the study was observed that 28% of the subjects were found to have normal serum albumin levels of 4mg/dl (as categorized for hemodialysis patients), 78% percent of the subjects were having serum albumin levels between 3.5mg/dl to 3.9mg/dl and 22% of the subjects had serum albumin levels less than 3.5mg/dl. There was no significant correlation between SGA and serum albumin levels (Chi-square value-1.922) Thus SGA can be used only to identify the degree of malnutrition in hemodialysis

The dietary evaluation of that was carried out in this study was using food frequency questionnaire. All patients consumed cereals (mostly rice) daily but they did not meet their requirements. Vegetarians and non vegetarians in this study consumed pulses weekly thrice. Consumption of white meats including eggs was very poor which was found to be weekly once or twice. Fruits and vegetable consumption was not satisfactory. The consumption of beverages such as coffee and tea per day was more than three servings. Fouque et al, 2007, in his study depits the finding of this study that the predominant cause for malnutrition is the decreased dietary intake.

Summary and conclusion

Nutrition plays a vital role in the management of patients with CKD, especially ESRD. Assessment of nutritional status helps in identifying the nutritional status of the patients and thereby helps in early dietary intervention to reduce the risk of mortality and morbidity in the hemodialysis subjects. In this study, fifty three percent of the subjects were found to be moderately malnourished. Helping these patients to understand about the importance of nutrition will help them in their survival.

REFERENCES

1.Arikan,H and Tuglular,S. (2005). The growing global burden of end stage renal disease (ESRD). Marmara Medical College Journal. 18 (3):143-50. | | 2.Stengel,B, Billon, S, Dijk ,PC,W, Jager K,J, Dekker,F,W, Slimpson K, et al. (2003). Trends in the incidence of renal replacement therapy for end-stage renal disease in Europe, 1990-1999. Nephrol Dial Transplant. 18:1824-33. |