Nepalese Medical Journal, (2018) Vol. 1, 12 - 16

Original Article

Nutritional Status of Out-patient Hemodialysis Patients in a Hospital-based Hemodialysis Centre in Nepal

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ABSTRACT

Introduction: Malnutrition is common among patients on chronic hemodialysis and is a risk factor. Nutritional assessment ensures early recognition and appropriate intervention. Dietary interview, physical and anthropometric measurements, biochemical assessment, bio-impedance, and structured assessment tools like subjective global assessment are modalities for identifying and monitoring of nutritional assessment of hemodialysis patients. This study was conducted to assess the nutritional status of hemodialysis patients and identify various factors related to malnutrition.

Materials and Methods: A cross-sectional study of 72 chronic hemodialysis patients at a hemodialysis unit in Lalitpur was done. Detailed dietary and personal interview, anthropometric measurements, biochemical assessment, and subjective global assessment were used to collect the data to determine the prevalence of malnutrition among the hemodialysis patients as well as identify various factors related.

Results: Malnutrition was prevalent among the respondents. The respondents were mostly male with average age of 50.2 ± 1.9 years and majority being on hemodialysis for more than two years. Though severe malnutrition was absent among the hemodialysis patients assessed, mild to moderate malnutrition was seen in 52.78%. Most of these patients were female and were of older age group. Patients who had malnutrition had experienced a significant weight loss in previous six months. Anthropometric profile, dietary habits, and biochemical profile did not correlate with occurrence of malnutrition in hemodialysis patients.

Conclusions: Malnutrition is fairly prevalent in chronic hemodialysis patients which can be identified by subjective global assessment. Elderly patients and patients who are losing weight are risk factors for mild to moderate malnutrition.

KEYWORDS: Assessment; Hemodialysis; Malnutrition; Nutrition

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Submitted: 20th January 2018
Accepted: 16th April 2018
Published: 1st June 2018

Sources of Support: None
Conflict of Interest: None

Citation: Khadka R, Basnet NB, Kafle RK. Nutritional Status of Out-patient Hemodialysis Patients in a Hospital-based Hemodialysis Centre in Nepal. Nep Med J 2018;1:12-6. DOI: 10.3126/nmj.v1i1.20392

INTRODUCTION

Malnutrition in hemodialysis patient has been shown to be related to increase the risk of morbidity and mortality.[1-3] At the same time, the prevalence of malnutrition has been shown to be very high among hemodialysis patients due to various contributing factors.[4-8] The causes of malnutrition among hemodialysis patients are identified as chronic metabolic acidosis, resistance to anabolic hormones, catabolism of protein during hemodialysis, systemic inflammation, inadequate dietary intake, anorexia, uremic toxins, medications, and taste abnormalities.[9]

Malnutrition has to be identified early and tackled appropriately. Several tools have been developed and tested to identify malnutrition among hemodialysis patients. This includes anthropometric measurements, biochemical parameters, bio-

impedance analysis[11,12,] and subjective global assessment (SGA).[10,13,14] A simple and reliable tool that can be administered easily is required for monitoring of the patients.

Subjective global assessment is a reliable and validated tool and is the most commonly used tool for detection and monitoring of malnutrition in dialysis patients.[13-15] It is recognized by the National Kidney Foundation/ Dialysis Outcome and Quality Initiative (K/DOQI). The correlation of low score in SGA and morbidity and mortality has been demonstrated in various previous studies.[13-15] This tool can be easily administered by nurses, dietitians, and physicians. SGA is designed to represent all the aspects of nutrition – weight change of the patients, dietary intake, gastrointestinal symptoms, loss of subcutaneous fat, and muscle wasting. The aim of this study is to assess the nutritional status of patients on maintenance hemodialysis based on interview, examination, and biochemical parameters.

MATERIALS AND METHODS

This was a cross-sectional study conducted on out-patient maintenance hemodialysis patients at a hemodialysis unit in Lalitpur, Nepal. Prior to conduction of study, permission from ethical committee was obtained. This study was done on a convenience sample of seventy two chronic out-patient hemodialysis patients in March, 2017. These patients or their caregivers gave informed consent to participate in the study. Each patient along with their caregivers were explained the purpose of the study and given option to either participate or decline from participation. Patients admitted for various reasons and who were receiving parenteral or tube feeding were excluded from the study.

NUTRITIONAL ASSESSMENT TOOLS

Interview and dietary review

The respondents were interviewed regarding their demographic profile, medical history regarding co-morbidities and renal disease, and hemodialysis vintage. A detailed dietary history was elucidated from the patients by the dietitian regarding their compliance and understanding of the dietary advice. One week dietary recall history was taken to identify the dietary practice of the patients.

Anthropometric measurements

All the patients were subjected to anthropometric measurements to record their dry weight and body mass index.

Biochemical Measurements

Recent biochemical values of the patients were noted from the patient's chart which included renal function parameters, serum protein, serum albumin, calcium, phosphorus, and uric acid levels. The patients were categorized as having normal measurements or inadequate level.

Subjective Global Assessment

SGA is a validated tool[13-15] that is rated on a scale from one to seven based on subjective judgment of the observer. This nutritional assessment tool was administered by the dietitian to assess the responding patients in two major categories – history and physical examination. This is a fairly easy-to-apply tool that has been widely applied by dietitians, nurses, and physicians for nutritional assessment and monitoring of the patients. The information required if obtained from the medical records, by interviewing the patients or caregivers, and physical examination of the patients. Physical examination comprises of examination of the patients to note their fat and muscle wasting or edema. Each category is scaled from one to seven and patients categorized according to the overall scoring. A rating of six to seven, three to five, and one to two are categorized as having no malnourishment, mild to moderate malnourishment, and severe malnourishment, respectively.

Statistical Analysis

The collected data were tabulated and subjected to statistical analysis in LibreOffice 6.0.3. The results have been expressed as means and standard error (mean $\pm$ SE). T-tests were used to analyze continuous variables and Fisher's exact test used to analyze categorical variables. The statistical significance was set at $p => 0.05$.

RESULTS

The respondents were mostly male patients 43 (60%) with an average age of 50.2 $\pm$ 1.9 years (fig. 1). Most of these patients had been on hemodialysis for more than a year. (fig. 2)

The respondents had all received nutritional counseling at the time of hemodialysis initiation and had also received nutritional review within three months of the study. Majority of the patients confirmed their compliance to the dietary advice with only 7 (9.7%) of them admitting to deviation. Most of the patients had a dietary habit of taking three (n=32; 44.4%) to four (n=30; 41.67%) sets of meals in a day (fig. 3). When asked if they were able to finish all the food served to them, 19.4% of the patients were unable to finish the set of meal.

Source of carbohydrate and proteins were specifically inquired in dietary interview. Nine (12.5%) of the patients responding were vegetarians. Others identified chicken, milk, or egg as sources of protein. (fig.4)

The patients were categorized as having no malnutrition, mild to moderate malnutrition, and severe malnutrition by SGA as described. None of the responding patients had severe degree of malnourishment. More than half of the patients (n=38; 52.78%) of the patients were categorized as having mild to moderate malnutrition. The patients who had malnourishment were comparatively older (53.7 $\pm$ 2.4 years vs. 46.3 $\pm$ 2.9 years, $p<0.05$) and had significantly more weight loss (3.7 $\pm$ 1.2% vs. 0.2 $\pm$ 0.8%, $p<0.05$) in previous six months. However; there was no significant difference in biochemical parameters including serum creatinine and serum protein/albumin between the malnourished and well-nourished groups.

The male patients were found to weigh significantly heavier than the female patients (56.2 $\pm$ 1.8 kg vs. 50.7 $\pm$ 2.1 kg, $p<0.05$). Prevalence of malnutrition was higher in female patients than in male patients though this was not statistically significant (62.1% vs. 44.2%, p=0.16). Other variables like weight loss and biochemical parameters were also not significantly different between the male and female respondents.

Comparison between patients who were younger than the average

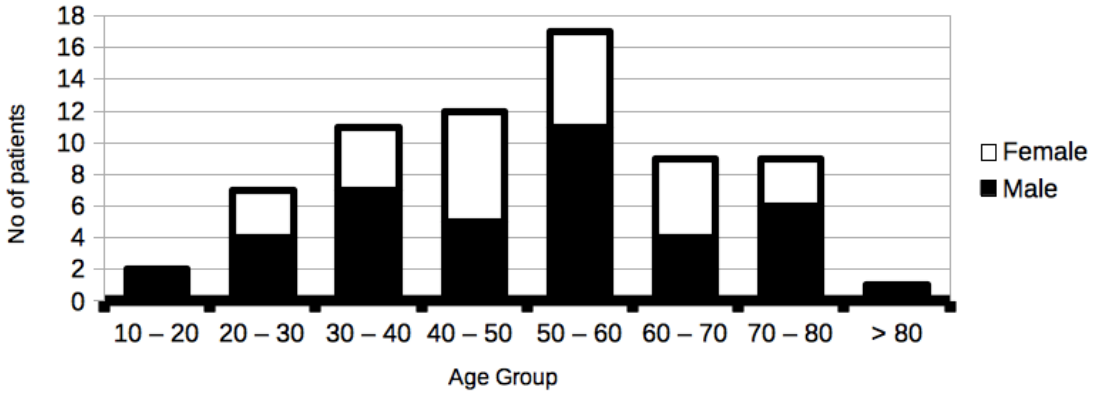

Figure 1: Age and sex-wise distribution of respondents.

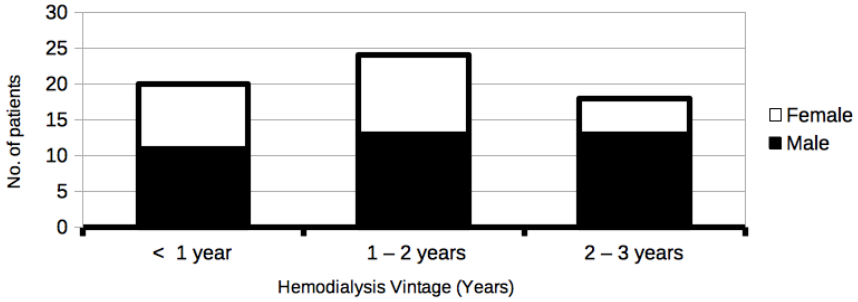

Figure2: Hemodialysis vintage of the respondents.

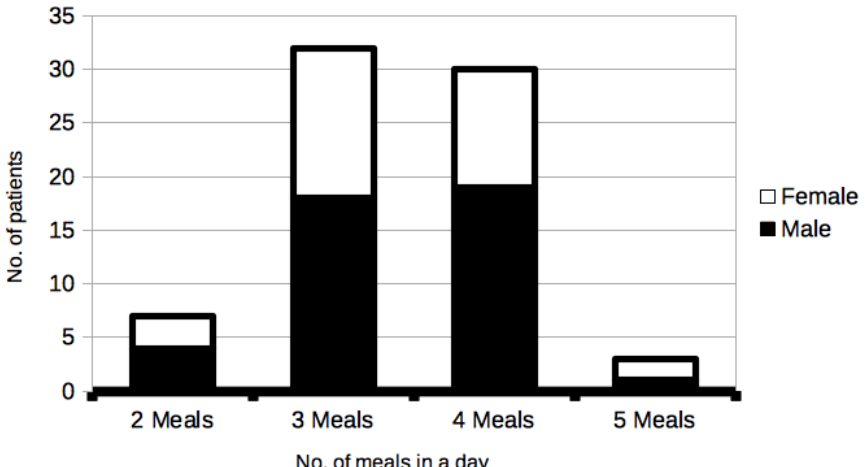

Figure 3: Number of meals in a day

and older than the average age showed that older patients were given more number of meals in a day (3.5 ± 0.16 meals vs 2.9 ± 0.17 meals, $p < 0.01$) and also weighed more than the younger patients (57.5 ± 2.97 kg vs 48.19 ± 2.5 kg, $p < 0.01$). Weight loss in previous six months and biochemical parameters, however, remained comparable between the two age groups. Prevalence of malnourishment was higher in older age group though this was not significant statistically (59.1% vs 37.5%, $p = 0.32$) (fig. 5).

DISCUSSION

Malnutrition is multifactorial[5] and said to be a risk factor for morbidity and mortality[1-3] among hemodialysis patients. SGA,[13] which is an easy and inexpensive but a validated tool for nutritional assessment,[13-15] was applied to categorize the hemodialysis patients at an out-patient hemodialysis centre in Nepal. It is usually expected that with the initiation of hemodialysis, the patients improve their appetite and are given more liberty to increase their protein intake than when not under hemodialysis which result improved nutritional status of the patients. This study of a small cohort of hemodialysis patients found malnourishment to be prevalent in more than half of the sampled hemodialysis patients. The study population was mostly comprised of young and male patients. These patients were given adequate orientation to the diet that is good for their health and regularly reviewed. Majority of the patients were content with the dietary advice and claimed to follow the dietary guidance. Various sources of protein and carbohydrate were identified by the patients during

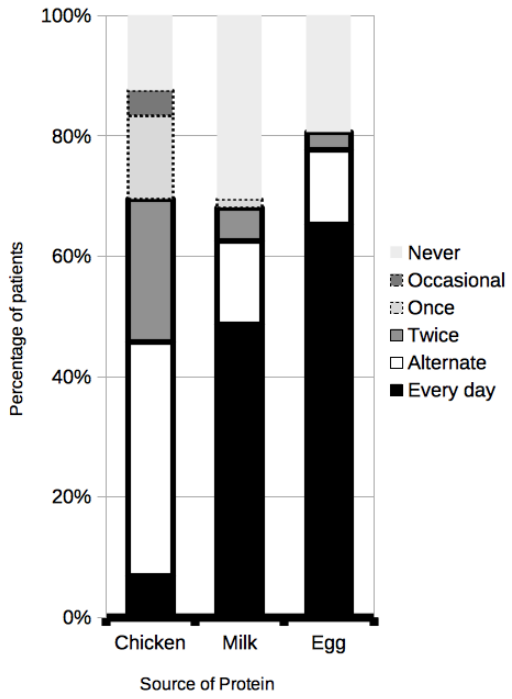

Figure 4: Bar diagram showing source of protein in respondents' meal and its percentage.

the interview.

Study done in Jeddah[7], Kathmandu[4], Jordan[8], Iran[5], Brazil[9], Palestine[6], and India[15] have shown malnutrition prevalent in 22.4% to 67.9% of the patients under chronic hemodialysis. In our study 52.8% of the patients suffered from mild to moderate malnutrition which was similar in comparison with the previous studies. Severe malnutrition was not noted in hemodialysis patients in all these studies except the Iranian study[5] which showed high prevalence of malnutrition among the study population of 112 patients in two hemodialysis centers. 18.8% of the study population was severely malnourished in Iranian study[5]. None of the patients in our study had severe degree of malnutrition. Iranian study[5] categorized malnutrition based on anthropometry and biochemical parameters and calculated Dialysis Malnutrition Score.

The patients who were found to be malnourished were mostly elderly patients who were experiencing a notable weight loss

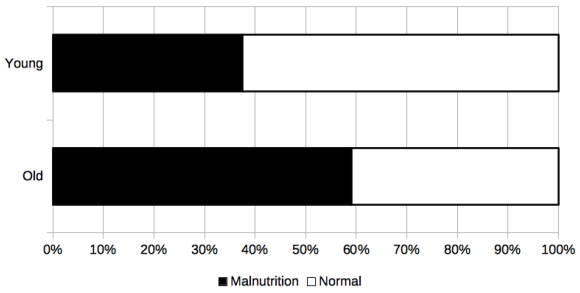

Figure 5: Prevalence of malnutrition in young and older respondents.

in previous six months. Weight loss can be considered an early predictor of malnourishment and elderly populations are at risk of malnourishment. Malnutrition was said to be significantly more common among female patients. 66.4% of the female patients were shown to be having malnutrition in Jeddah.[7] Study done in by Sedhain et. al. in Kathmandu[4] suggested relatively worse nutritional status of women than men though no statistical difference was shown. Studies in Brazil[9] and Palestine[6] showed similar occurrence of malnutrition among men and women. Similar to study in Kathmandu[4], prevalence of malnutrition was higher in female patients but this was not statistically significant. Other nutritional assessment tools – anthropometric and biochemical parameters – were not found to predict malnourishment.

This study couldn't establish relationship between nutritional status and the number of hemodialysis sessions in a week, hemodialysis vintage, source of protein and carbohydrate, number of meals in a day, anthropometric measurements, and biochemical parameters of the patients. The small number of patients and study limited to a single center are limitations of this study.

CONCLUSIONS

Malnutrition is fairly prevalent in hemodialysis patients. Elderly patients are more prone to malnourishment. Malnourishment can be predicted by loss of dry weight in six months period. Malnourishment is slightly more prevalent in female hemodialysis patients. SGA is a reliable tool that can be easily applied in practice to identify and monitor patients on hemodialysis.

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