



## Nutritional Status of Chronic Kidney Disease Patient Admitted at a Tertiary Care Hospital

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**ABSTRACT**

**Background:** Chronic kidney disease (CKD) is characterized by progressive reduction of renal function. With increase in the prevalence of diabetes and hypertension and the wider availability of therapy such as dialysis and kidney transplantation, has increased the prevalence of patients with CKD. Because of loss protein in urine and other metabolic disarrangement, malnutrition is common among CKD patients. **Material and Methods:** we conducted a cross sectional study at the renal unit of department of medicine at a tertiary care hospital. We used various anthropometric methods to assess the nutritional status of patient admitted with chronic kidney disease but not requiring dialysis.**Results:**A total of 47 patients fulfilling our inclusion criteria were admitted to the ward and of them 35 were enrolled in the present study. Of the total 35 patients 18 were female patients. The proportion of patients with different co-morbid conditions was Diabetes (31.4%) , Hypertension(68.6 %), anemia(97.1%), and albuminuria (20.0%) and 22.9 % of patient had both diabetic and hypertension. Overall 6 (17.1%) patient didn't had any degree of malnutrition, 22(62.9 %) participants had mild to moderate degree of malnutrition and 7(20.0 %) had severe malnutrition. **Conclusion:** Considerable proportions of patient with chronic kidney disease were malnourished.

**KEYWORDS**

Chronic Kidney Disease, Malnutrition, Diabetes

**Introduction:** Chronic kidney disease (CKD), characterized by progressive reduction of renal function, has become an important public health problem in many parts of world. The burden on healthcare system due to CKD patients is constantly increasing every day and the prevalence of CKD has reached at significant level in some Asian countries such as Korea, Taiwan, Japan, China, and India as well (Stevenkel, P., et al 2002). This number will increase further in coming years as the number of person with diabetic and hypertension is continuously increasing and also proportion of geriatric age group person in population is constantly increasing. The wider availability of curative therapy such as dialysis and kidney transplantation, contribute to further increase the prevalence of patients with CKD(Cano. N.J., et al 2009).

Like many of the major medical problems of public health importance, there is a significant importance of nutritional status of patient in the outcome and quality of life among CKD patients(Laws.R.A., et al 2000). It is widely known that there is not a single marker of nutritional status in patients with chronic kidney disease, and therefore several nutritional markers should be evaluated together to reach any conclusion (Kondrup. J., et al 2003). The assessment of nutritional status is based on clinical, biophysical and biochemical parameters. Clinical assessment of subcutaneous fat, muscle mass and history of weight loss are important parts of routine nutritional assessment. In addition many other studies have used body mass index (BMI), skin fold thickness, mid arm circumference and mid-arm muscle circumference to assess patient's nutritional status (Kopple. J.D., 2001, De Mutsert.R., et al 201). The most commonly used laboratory parameters for routine assessment of nutritional status are plasma concentrations of albumin, transferrin, and other liver derived proteins(Henn. A., 2010). In recent years, subjective global assessment of nutritional status (SGA) has been used increasingly to assess nutritional status in many studies of patients with chronic kidney disease. SGA correlates well with other nutritional markers in patients with chronic renal disease. This study was therefore carried out with the objective of assessing the prevalence of malnutrition using multiple parameters in patients with chronic kidney disease not requiring dialysis.

**Material and Methods: Study setting:** This was a cross sectional study conducted in the renal unit of department of medicine at a tertiary care institute. The total duration of study was 1 year out of which duration of data collection was 8 months. **Sampling:** Non-probability purposive sampling method was used. **Study participants:** All patient with chronic kidney disease admitted to renal unit of medicine ward. For the purpose of study we defined Chronic Kidney Disease as any person with following clinical parameter

1. Kidney damage for  $\geq 3$  months, as evident by structural or functional abnormalities of the kidney with or without decreased GFR manifested by either: Pathological abnormalities or markers of kidney damage including abnormalities in the composition of blood and urine, or abnormalities in imaging tests. 2) GFR < 60ml/min/1.73m<sup>2</sup> for  $\geq 3$  months, with or without kidney damage. **Inclusion Criteria:** 1. All patients of chronic kidney disease which did not require haemodialysis. 2. Patient who gave valid informed written consent for study. **Exclusion Criteria:** Patient who were 1. HIV positive 2. Diagnosed as Pulmonary TB 3. Patient who were on haemodialysis, peritoneal dialysis or waiting for renal transplant were excluded from study. **Data Collection:** A pretested predesigned questionnaire was used to collect information on demographic, social, diseases related information, information about co-morbid condition etc. Patient responses to the Subjective Global Assessment (SGA) questionnaire was recorded. Malnutrition status was assessed on 7 different components which were change in weight, dietary history, gastrointestinal symptoms, functional capacity, co morbidities, and assessment of subcutaneous fat and signs of muscle wasting. Thus a total malnutrition score was calculated and it had a minimum score of 7 and maximum score of 35. Patients having score between 7-10 are considered as well-nourished patients. Score between 11-22 are considered as having mild to moderate malnutrition, and score between 23-35 are considered as severely malnourished. All the patients included in the study underwent different anthropometric measurements. The weight was measured in kilograms. The patients were assessed without shoes on and with as little clothing as possible. We used an electronic scale for the weight measurements, which was pre-checked for its calibration. The patients' heights were obtained using a stadiometer. These heights were used in

combination with the weights to calculate the body mass index (BMI) for the nutritional assessment. The Triceps Skin Fold (TSF) was measured with the aid of an adipometer, two inches above the midpoint between the acromial process of the scapula and the olecranon. The UAC was measured (in centimeters) using an inelastic and non-extendable tape of length 150 cm, graduated in divisions of 0.1 cm, at the midpoint of the extended upper arm, i.e. at the same site where the TSF was obtained. All measurements were made on the opposite side of the arm to the arteriovenous fistula. The UAMC was calculated using the formula: UAMC (cm) = UAC (cm)-3.14 x TSF (cm).

The patients' nutritional characteristics were analyzed using descriptive statistics, with tabulation using the Microsoft Excel software. Frequency distributions of absolute and relative variables of interest were then analyzed accordingly. The data were also analyzed to make correlations between quantitative variables, by calculating the correlation coefficient (*r*). The ethical clearance was obtained from the institutes ethical committee before the start of present study.

#### **RESULTS: about table 1 here**

A total of 114 patient with CKD were admitted to the ward and of then 47 fulfilled our inclusion criteria and finally 35 were enrolled and completed present study. Of the total 35 patient 18 were female (51.4%) and rest were males. The age of study participants ranged from 26 to 78 years. Most of the patient study participants were in the age group of 30-60 years (82.3 %) and were Hindu(60.0 %). The proportion of patients with different co-morbid conditions was Diabetes (31.4%), Hypertension(68.6 %), anaemia(97.1%), and albuminuria(20.0%) and 22.9 % of patient had both diabetic and hypertension.

**Table 1: Different characteristic of study Participant (n=35)**

Characteristics	n (%)
<b>Age</b>	
<30 Years	4(11.4)
30-60 Years	29(82.3)
>60 Years	2(5.7)
<b>Gender</b>	
Male	17(48.6)
Female	18(51.4)
<b>Religion</b>	
Hindu	21(60.0)
Muslim	8(22.9)
Others	6(17.1)
<b>Co-morbid conditions</b>	
Diabetes	11(31.4)
Hypertension	24(68.6)
Anaemia	34(97.1)
Albuminuria	7(20.0)
Diabetes+Hypertension	8(22.9)

#### **About Table-2 here**

Overall 6 (17.1%) patient didn't had any degree of malnutrition, 22(62.9 %) participants had mild to moderate degree

of malnutrition and 7(20.0 %) had severe malnutrition. Most of the participants who had severe malnutrition were females (14.3 %), and were in the age group 30-60 years of age(17.1 %). Most of those who didn't had any degree of malnutrition were also in the age group of 30-60 years of age (11.4%) and were males and females equally. The proportion of diabetic participants who had mild-moderate and severe degree of malnutrition was 20.0 % and 8.9 % respectively. While the proportion of hypertensive who had mild-moderate and severe degree of malnutrition was 48.6 % and 11.4 % respectively. Out of total 8 participants who had diabetes as well as hypertension 7(87.5%) were severely malnourished.

**Table 2: Degree of malnutrition according to the various characteristics of study participants (n=35)**

Characteristics	No Malnutrition	Mild & Moderate Malnutrition	Severe Malnutrition
<b>Age</b>			
<30 Years	2(5.7)	2(5.7)	0(0.0)
30-60 Years	4(11.4)	19(54.3)	6(17.1)
>60 Years	0(0.0)	1(2.9)	1(2.9)
<b>Gender</b>			
Male	3(8.9)	11(31.4)	2(5.7)
Female	3(8.9)	11(31.4)	5(14.3)
<b>Diabetes(n=11)</b>			
Present	1(9.1)	7(63.6)	3(27.3)
<b>Hypertension (n=24)</b>			
Present	3(12.5)	17(70.8)	4(16.7)
<b>Diabetic Hypertensive (n =8)</b>			
Present	0(0.0)	1(12.5)	7(87.5)

**DISCUSSION:** Although it is very important to determine the nutritional status of patient but the metabolic derangement in CKD makes it's difficult if not impossible to determine the exact nutritional status of patients. In this study we evaluated the nutritional status of 35 patients who were diagnosed with CKD but didn't required haemodialysis. Of the total 35 patient 18 were female (51.4%) and rest were males. The ages of study participants ranged from 26 to 78 years.

Overall 6 (17.1%) patient didn't had any degree of malnutrition, 22(62.9 %) participants had mild to moderate degree of malnutrition and 7(20.0 %) had severe malnutrition. Most of the participants who had severe malnutrition were females (14.3 %), and were in the age group 30-60 years of age(17.1 %).

**LIMITATIONS:** In present study most of the patients were from low socio economic status, so effect of socio economic status could not be assessed which could have profound impact on nutrition. The main limitation of this study relates to the fact that it was based on a single measurement of anthropometric and biochemical parameters. Better results would obtained if anthropometric evaluations must be performed on patients over time so that these patients can serve as their own control, given that there are no specific reference values for patients in this condition.

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