

Research article

Nutritional assessment in pre-dialysis chronic kidney disease (CKD), stage V in Al-Wahda hospital, Derna-Libya.

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Abstract:

The aim of this study was to assess the nutritional status in Libyan chronic kidney disease (CKD), with stage V dialyzed Patients were selected from a government medical Al-Wahda hospital, outpatient dialysis unit, and to compare the nutritional indicators, biochemical investigation were made pre-dialysis. maintain good nutritional status, slow progression, and to treat complications. This study was conducted in 31 patients (17 female and 14 male). In this study, Average age was 44.06 years, and 50.26 years, of female and male respectively Anthropometric measurements, weight, height and Body Mass Index (BMI), BMI was 27.45 kg/m² (SD± 7.57), of female and 25.47 Kg/m², (SD±3.90) of male. Biochemical parameters such as, (BUN, cholesterol, creatinine, uric acid, albumin, globulin, Sodium, potassium, calcium, and phosphate), were done to assess the nutritional status in pre-dialysis chronic kidney disease (CKD), stage V, in Al-Wahda hospital. This study revealed that Food intakes was normal range in potassium and sodium while rich in phosphorus. The results revealed that mean daily intake of albumin (g/dl) and globulin (g/dl) were healthy according to normal range while BUN (mg/dl) and createnin (mg/dl) are generally high in both sexes.

Keyword: biochemical analysis, 24-hours recall, anthropometric measurements.

Introduction:

The kidneys are a pair vital organs located in the back of the abdomen one on each side of the spinal column, at about the level of the lower ribs, Each kidney is about 4 or 5 inches long account for 0.5% of body weight . As the kidneys filter blood, they create urine, which collects in the kidneys' pelvis -- funnel-shaped structures that drain the waste down through tubes called ureters to the bladder. The kidney receives about 20 percent of the blood coming from the heart each time it beats. The rate of blood flow through both kidneys is approximately 1.2 liters per minute. Each kidney contains around a million units that is called (nephrons), each of which is a microscopic filter for blood. Serious health problems occur when people have less than 25 percent of their kidney function. In a chronic kidney disease, diet is an important part of the treatment plan . The recommended diet may change over time depended on the stage of disease. Treatment goals require that the best possible nutritional status be established and maintained, and that a nutritional plan the patient can accept and adhere to be created. This requires the intervention of a dietitian.

Material and Method:

The diet survey was conducted in this study by using questionnaire, are written reports of foods eaten during 24 hours recall as well as food frequency questionnaire (FFQ). Biochemical parameters levels like BUN, cholesterol, creatinine, uric acid, albumin, globulin, Sodium, potassium, calcium, and phosphate were analyzed pre- dialyzed according to medical records after diet intake within 24 hrs-recall by medical laboratory in Al-Wahda hospital. Diets intake were then entered into nutrients analysis software (Nutrisurvey for Windows, copyright)© (1). The anthropometric measurements that are valid for assessing nutritional status include, weight, height and body mass index (BMI) calculated by divided weight (kg) by height squared (m).

Statistical analysis:

Statistical analysis was done using Statistical Package of Social Science (SPSS), version 13.0 under Microsoft Windows 7© profession was used for data analysis. The mean and standard deviation of these nutritional indicators were calculated. The means were compared using One Way Analysis of Variance (ANOVA) and $p < 0.05$ was taken as significant.

Results:

This study was conducted in 31 patients (17 female and 14 male), from outpatient dialysis unit, in Wahda hospital - Derna, to assess the nutritional status of CKD patients. Average age was 44.06 years ($SD \pm 18.24$), and 50.26 years ($SD \pm 15.13$), of female and male respectively. Weight was 67.43 kg, ($SD \pm 17.86$) of female, and 72.41kg, ($SD \pm 16.88$), of male, height was 159.43 cm, ($SD \pm 5.46$), and 167.26 cm ($SD \pm 10.72$) of female, male respectively, and BMI was 27.45 kg/m^2 ($SD \pm 7.57$), of female and 25.47 Kg/m^2 , ($SD \pm 3.90$) of male, as shown in table 1 and 2. Anthropometric measurements and biochemical investigations were done to assess the nutritional status of the patients, the analysis was done pre- dialysis session. The following investigations were made, BUN, cholesterol, creatinine, uric acid, albumin, globulin, Sodium, potassium, calcium, and phosphate. There is no a significant difference in the mean of biochemical parameters between male and female values $p > 0.05$.

Table 1: showed mean and \pm SD of different parameters of stage V pre-dialysis of female patients.

Parameter	Maximum	Mean	Minimum	\pm SD
Age	85.00	44.06	16.00	18.24
weight	108.00	67.43	48.00	17.86
Height	168.00	159.43	152.00	5.46
BMI	45.54	27.45	18.33	7.57
BUN(mg/dl)	116.00	72.75	52.00	16.61
Cholesterol (mg/dl)	201.00	131.73	91.00	29.73
Creatinin (mg/dl)	15.10	10.82	6.90	2.02
Uric acid (mg/dl)	7.90	5.54	1.30	1.71
Albumin (g/dl)	4.30	3.88	3.30	0.30
Globulin (g/dl)	4.10	3.00	1.70	0.67
Iron (mg/dl)	166.00	62.13	34.00	38.56
Sodium (mmol/l)	138.50	132.68	128.00	3.01
Potassium(mmol/l)	7.10	5.23	4.16	0.85
Calcium (mmol/l)	1.32	1.01	0.62	0.21
Phosphate(mmol/L)	11.70	5.93	3.14	3.02

Table 2: showed mean and SD of different parameters of stage V pre-dialysis of male patients.

Parameter	Maximum	Mean	Minimum	\pm SD
Age (year)	69.00	50.26	16.00	15.13
Weight (kg)	94.00	72.41	40.00	16.88
Height (cm)	181.00	167.26	144.00	10.72
BMI (kg/m ²)	30.47	25.47	19.32	3.90
BUN (mg/dl)	114.00	69.00	37.00	19.10
Cholesterol(mg/dl)	223.00	131.40	92.00	35.02
Creatinin (mg/dl)	16.20	10.72	6.10	3.08
Uric acid (mg/dl)	8.3	5.72	3.50	1.47
Albumin (g/dl)	4.30	3.72	3.00	0.42
Globulin (g/dl)	3.20	2.61	2.10	.33
Iron (mg/dl)	105.00	68.73	32.00	20.45
Sodium (mmol/l)	136.00	129.67	126.40	3.00
Potassium (mmol/l)	6.80	5.23	3.40	0.83
Calcium (mmol/l)	1.39	1.21	0.97	0.13
Phosphate (mmol/l)	8.70	6.10	2.50	1.70

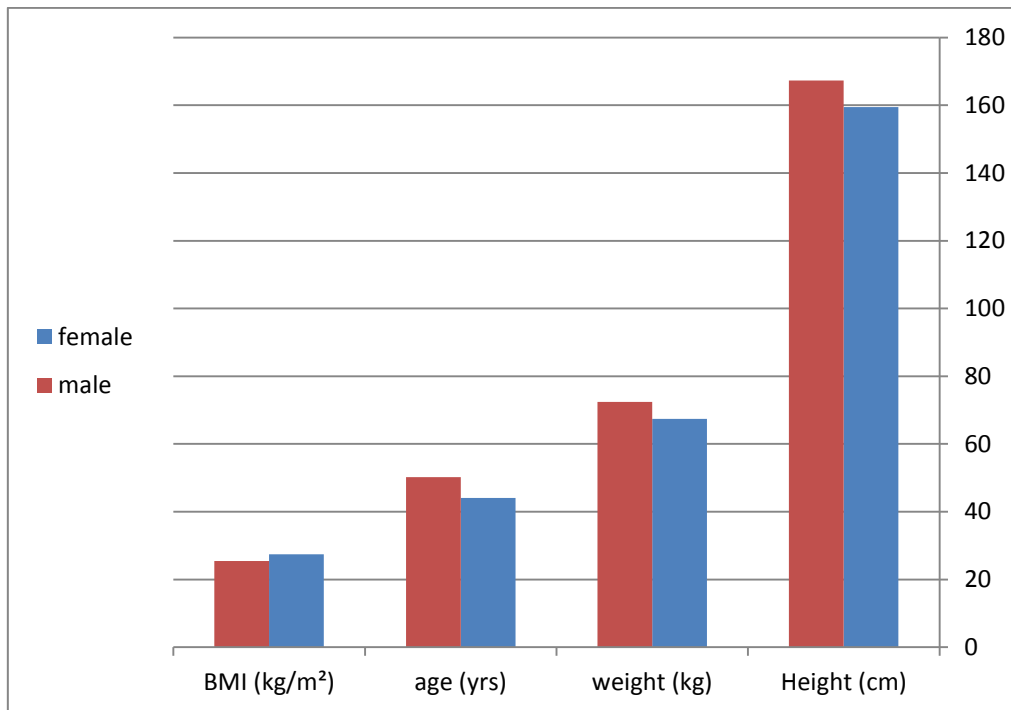


Figure 1: Distribution of the anthropometric measurements among female and male.

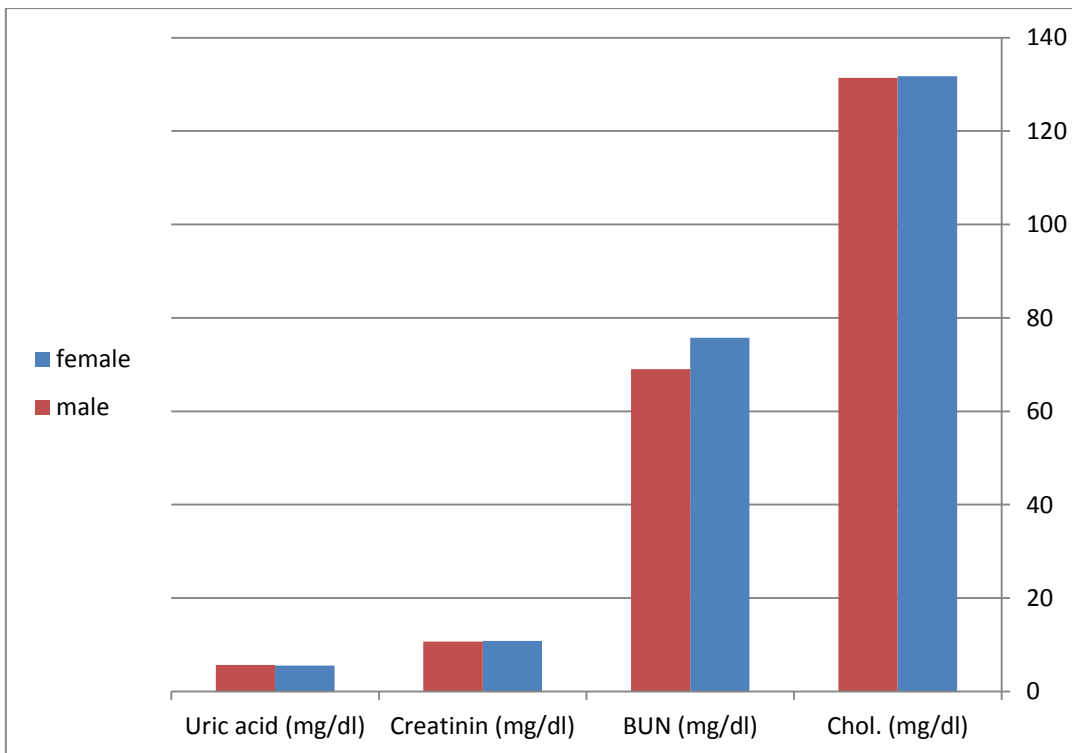


Figure 2: The relationship of biochemical's analysis among female and male

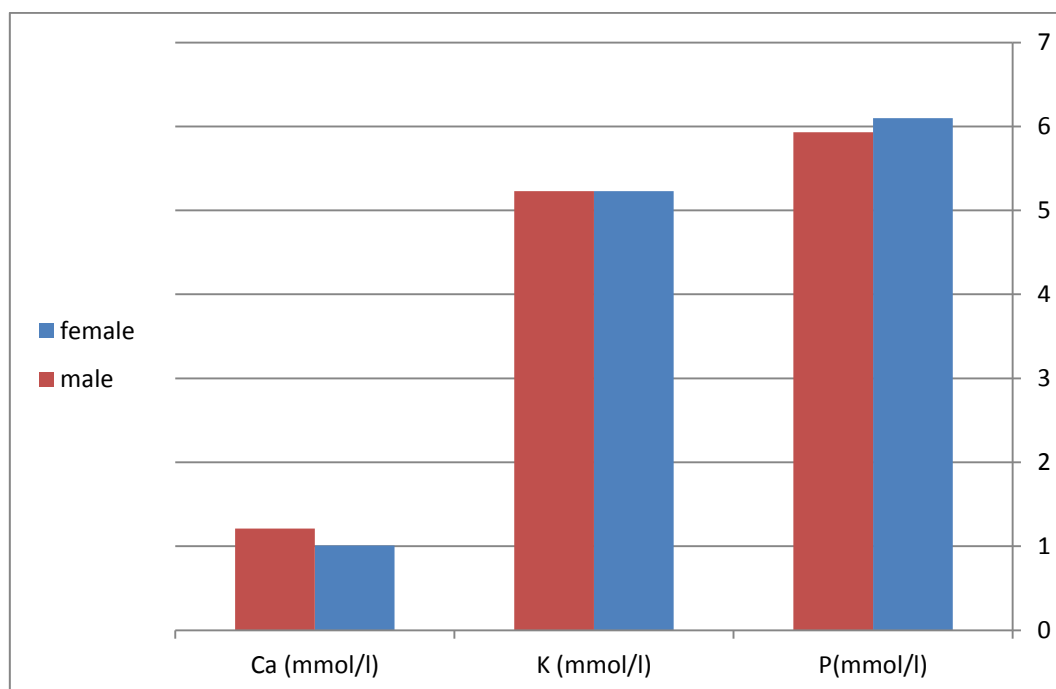


Figure 3: Showed phosphorus level was higher than Potassium and calcium.

Analysis of diet intake during 24 hrs- recall by patients, as showing in table 3. and figure 4.

Table 3: Showed diet intake within 24hrs-recall.

Food	Amount	energy	carbohydr.
Condensed milk 7.5 % fat	170 g	226.3 kcal	16.5 g
Yoghurt with fruit	150 g	148.4 kcal	21.1 g
Cheese slices	30 g	81.4 kcal	1.9 g
Wholemeal bread	50 g	93.9 kcal	18.8 g
Tea black with milk (beverage)	125 g	3.0 kcal	0.2 g
Beef lean fresh cooked	100 g	151.1 kcal	0.0 g
Apple fresh	125 g	64.8 kcal	14.3 g
Noodles without eggs	50 g	173.9 kcal	35.2 g
Rice not hulled cooked	150 g	168.1 kcal	35.0 g
Beef liver cooked	100 g	147.0 kcal	6.4 g

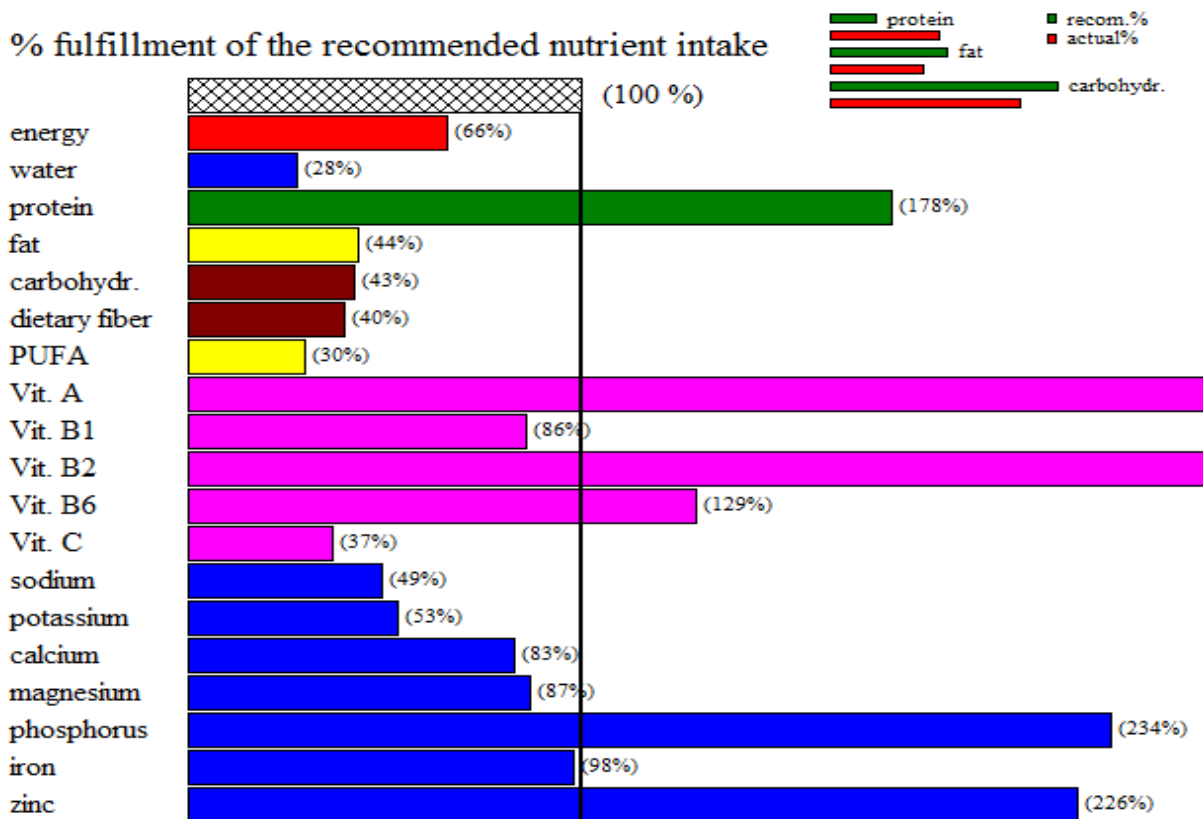


Figure 4: Showed daily nutrients intake during 24 hrs- recall.

Discussion:

In a chronic kidney disease, diet is an important part of the treatment plan. The recommended diet may change over time depended on the stage of disease. Nutrition plays an important role in the treatment of many chronic diseases, but uniquely to CKD, nutritional therapy allows good control of several consequences of the disease and has therefore the same clinical relevance as other types of medical therapies(2).

Hemodialysis is one type of dialysis. The procedure is done several times a week, usually for 3 to 4 hours at a time. The hemodialysis diet is designed to reduce the amount of fluid and waste that builds up between hemodialysis treatments. Malnutrition in CKD arises due to a variety of factors, including low dietary intake and metabolic disturbances (3), In our study malnutrition is not appeared. This study, showing that, female with CKD stage V, was overweight (BMI= 27.45 ± 7.57) higher than male (BMI= 25.47 Kg/m²,±3.90). Haemodialysis patients should have a BMI>23.0 kg/m² (4). Five main constituents of the diet normally have to be taken into account in this study, when planning diets for patients with CKD. These are water, protein, potassium, sodium and phosphorus. Restricted intake of sodium, potassium, and phosphorus throughout the progression of CKD can help reduce risks associated with accumulation of these minerals in the body. (Potassium restriction is not always necessary in peritoneal-dialysis patients). Problems can occur when blood potassium levels are either too low or too high. Potassium intake to be advised according to serum potassium levels. Damaged kidneys allow potassium to build up in the blood, causing serious heart problems. This study revealed that Foods intake was normal range in potassium and sodium while rich in phosphorus, such as dairy

products, too much phosphorus in the blood pulls calcium from the bones, making the bones weak and likely to break. According to 24-hrs recall, this results showed that 45.5% of CKD patients ate milk & milk products, 44.68 % of CKD patients ate plants sources. This study showing that about, 23.1% and 20.07% of patients ate from animals and snake sources respectively. The patients with chronic kidney disease (CKD) should control their protein intake to reach optimal body protective values(5). After an extensive review of the literature, most of the scientific societies worldwide recommend a daily allowance of 0.6–0.8g protein/kg/day for CKD patients with or without diabetes(6). Choosing sodium-free or low-sodium food products will help them reach that goal. Traditionally, serum proteins (partially albumin) have been utilized as key biochemical parameters for the assessment of nutritional status. The mean BUN were 72.75g/dl and 69.00 g/dl of female and male respectively, and the mean creatinin of female and male were 10.82mg/dl and 10.72 mg/dl respectively, these values are generally high when compared with normal range. This study revealed that mean daily intake of albumin and globulin were healthy according to normal range as shown in figure 5 .

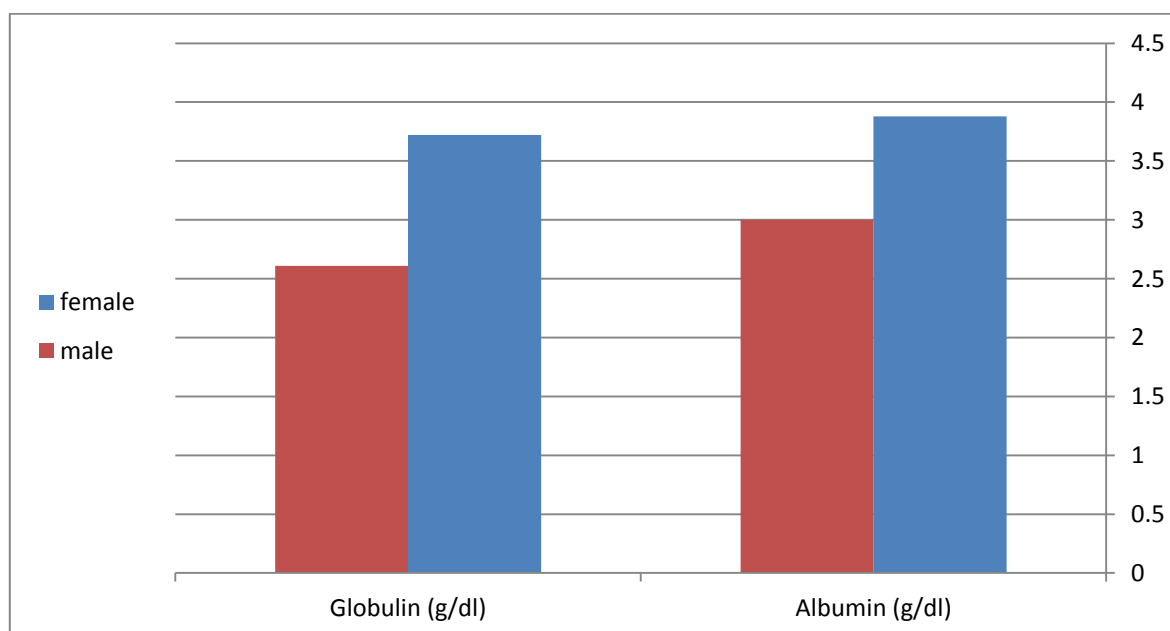


Figure 5: Showed Albumin and globulin intake (g/dl) among female and male.

Conclusion:

A chronic kidney disease, diet is an important part of the treatment plan . Studies have shown that as many as 78% of dialysis patients do not comply with diet restrictions, even though such adherence has demonstrated a decreased risk of symptoms and medical complications, and an increase in quality of life and life expectancy(7,8). The recommended diet may change over time depended on the stage of disease (9). Restricted intake of sodium, potassium, and phosphorus throughout the progression of CKD can help reduce risks associated with accumulation of these minerals in the body. Potassium content of most vegetables can be decreased through a process of leaching. Leaching entails slicing and soaking the vegetable overnight in water, then draining and boiling the vegetable in new water. low sodium content of plant foods is considered recommend ways to reduce sodium intake to decrease in blood pressure Studies show even one week on a

vegetarian diet can decrease phosphorus levels, these same results are not found with animal protein-based diets (10). This study revealed that serum phosphorus is elevated. People with CKD in stage V, need to be careful not to let too much sodium and phosphorus in a person's diet. Markers of nutritional status have been proved to be strong predictors of mortality in the CKD population (11).

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