Evaluation of the nutritional status of acute renal failure patients in Ashmoun Center Hospitals

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Abstract

Chronic kidney disease (CKD), which affects millions of people every year, can occur as a result of various diseases and health conditions. It also can occur when patients fail to take prescribed medications for chronic diseases or because of a poor financial situation that prevents patients from seeking treatment. Often, it can go undiagnosed because of poor medical follow-up by patients who have chronic medical conditions such as diabetes or hypertension. In this study, a total 100 patient suffered with kidney failure. Participants divided into two groups of females(48 members) and males(52 members).Data of research was collected through questionnaire. The anthropometric measurement (including weight, height and BMI), food habits and healthy status were determined. The results showed that. The total number of samples was in married, the higher percentage of the study sample from urban, the education status recorded the highest percentage of sample was in reads and writes. The most of samples were suffering obesity. Protein, fiber, calcium, magnesium and vitamins (C, B1, B2 and D) were lower in the both groups when the other nutrients in both groups were higher than DRI. There were significant changes between the both groups in hemoglobin, serum calcium, phosphorus, urinary calcium and creatinine while, there is no significant between the both groups for the other medical analysis. So, eating healthy is important if person have kidney failure. Good nutrition gives the energy to do daily tasks, prevent infection, build and keep muscle, and help you stay at a healthy body weight.A kidney-friendly diet should limit sodium, cholesterol, and fat and instead focus on fruits, vegetables, whole grains, low-fat dairy, and lean meats.

Keywords: Kidney failure,Dietary habits, mineral salts, vitamins, BMI

Introduction

Kidney failure is an increasingly common disorder, affecting 11% of the world adult population. It was estimated that in 2010 there were about 2 million patients worldwide in the end stage of this disease, i.e., being treated with renal replacement therapy. This number is expected to grow by as much as 7% per year. For decades, it has been believed that the main cause of kidney disease was glomerulonephritis. However, the rapidly increasing number of cases has compelled the scientific community to re-examine the causes of kidney failure. Several studies have shown a strong correlation between the occurrence of metabolic disorders, such as diabetes and hypertension, and the development of kidney diseases or nephropathy **(Lysaght , 2002; Zhang and Rothenbacher, 2008 and Kró et al., 2008)** . Dietary evaluation is of particular importance in those subgroups at risk for over nutrition or under nutrition. Examining the quality and quantity of diverse types of nutrients is also critical in assessing the dietary intake in those groups of individuals who need to extensively modify their nutrient intake. The patients with chronic kidney disease (CKD) have this requirement**(Jadeja and Kher, 2012)** . Hence, selecting the best methods to measure the type and amount of each nutrient in the ingested diet is of substantial importance to the management of the CKD patient. Furthermore, comprehensive assessment of dietary intake over time may allow more reliable investigation of the relationship between food intake pattern and both comorbid conditions and clinical outcomes in CKD populations. This may be particularly useful among chronic dialysis patients in whom mortality is quite high and where there is a strong association between mortality with their nutritional status (. Better knowledge of nutrition and nutritional support among CKD patients will help to optimize their clinical response **(Bonanni et al., 2011)**. Therefore, in this research, it aimed to investigate the nutritional status and other factors which effect on men and patient with kidney failure .

Materials and methods

Materials:

A total 100 patient and men with kidney enrolled in this study. The polytheists were among the visitors to governmental dialysis hospitals (Ashmoun General Hospital) and private (Al Arabi Hospital) in Ashmoun City (Menoufia Governorate). Participants divided into two groups according their gender (52 men and 48female) . The present study started in January 2021 and ended in January 2022.

Methods

The instrument of this study consisted of a structured interviewing questionnaire: Interviews were held with the patients using questionnaire sheet that were designed to collect data concerned about food habits, and anthropometric measurements as follows: The first one was for 24 hours' recall, the second one was for social data which include demographic data as age, sex, education level, and income. The third one for anthropometric measurements. The fourth sheet includes food habits it includes. Number of meals per day, what are the main meals, all the characteristics related to food habits. The fifth one is used for collected data about healthy status.

Socio-economic

The socio-economic data include education level; total income sources foods were collected by questionnaire through an interview.

Daily dietary data Dietary intakes of energy, proteins and other nutrients will be assessed by the 24-h recall method, which is a well-established tool. Long-term calcium intake was assessed using the Food Frequency Questionnaire (FFQ) method **(Wilson and Horwath, 1996)**.

Anthropometric measurements

It contains weight, and height according to **Jellife (1966)**. Body Mass Index (BMI) was obtained by calculating weight in kilograms/square height in meters (kg/m^2). In the case of the body mass index was greater than 27 and underweight lower than 16 **(Geoffrey,1995)** .

Health History

Health history include current health complaints and disease, and history of disease were collected chronic illnesses.

Food Habits

Information about food habits of studied persons were collected during an interview with the patients and including method of meals cooking, number of daily meals, drinks, fruit, type of fat used, salt, sugar preference and source of nutritional information.

Laboratory analysis

A fasting blood sample was collected and estimated for hemoglobin, serum protein, and serum albumin were determined according to the methods of **(Drabkin,1949; Henry, 1974and Doumas, 1971)** Respectively. The serum calcium, phosphorus, and zinc were carried out by the method of **(AOAC,1990)** While Urinary calcium and creatinine were estimated by the methods of **Baginski(1973) and Bohmer(1971)** respectively. .

Statistical analysis

Means and standard deviations of each variable were calculated. Frequency distribution and percentage of nutrients consumption of the sample compared to the RDA was done. Frequency distribution and percentage of anthropometric measurements of sample compared to the standard was also done. The data was computerized according to SPSS program(**SPSS,1995**).

Results and Discussion

Data given in table (1) presented the percentage distribution of the kidney failure patients according to marital status, it could be noticed that the total number of samples was in married (84.62%), (83.33%) for females and males respectively. For the residence, the higher percentage of the study sample from urban (68.75%), (67.31%) for females and males respectively. where the minority were from rural, it was (31.25%), (32.69%) for females and males respectively. From the same table, it was found that the education status recorded the highest percentage of sample was in reads and writes 73.08% for Females and 70.84% for males age on the other hand, the secondary recorded 25%for females and 23.08% for males while for university education were (4.16%), (3.84%) for females and males respectively. Socioeconomic status (SES) has been reported to be associated with a variety of both acute and chronic diseases. Recent studies suggest that a relationship may exist between SES and kidney failure it was reported that lower education and/or income were associated with lower BMD in elderly(**Bowman, 2009**)

Table (1): Percentage distribution of social status for kidney patient.

Social status		Females		Male	
		Frequency	percent	Frequency	Percent
Marital Status	Single	3	6.25%	2	3.85%
	Married	40	83.33%	44	84.62%
	Widower	5	10.42%	6	11.53%
Residence	Rural	15	31.25%	17	32.69%
	Urban	33	68.75%	35	67.31%
Education	Reads and writes	34	70.84%	38	73.08%
	Secondary	12	25%	12	23.08%
	University	2	4.16%	2	3.84%

The results of table (2) healthy status for patient with kidney failure. it was found that (67.30%) males suffering from Obesity and52.08% males suffering Obesity also. For hereditary ,it could be noticed that 62.5% from females the disease didn't linked with hereditary while the percentage was 61.54% for males . This result indicates a distortion in kidney health behavior, as well as a lack of proper kidney failure

education and instruction from healthcare providers. Some systemic conditions such as cardiovascular disease, diabetes mellitus, preterm birth, respiratory disease and systemic infections are related to kidney failure (**Wactawski,2001**)·

Table (2): Healthy status for patient with kidney failure.

Health Status		Females (n=48)		Males (n=52)	
		Frequency	percent	Frequency	Percent
Is it hereditary?	Yes	18	37.5**%**	20	38.46**%**
	No	30	62.5**%**	32	61.54**%**
Are you suffering from	Obesity	25	52.08**%**	35	67.30**%**
	Diabetes	7	14.59**%**	10	19.23**%**
	Heart	4	8.33**%**	2	3.85**%**
	Other disease	12	25**%**	5	9.62**%**

Table (3) shows that the anthropometric measurements for patient. It could be found that there were significant differences between the both groups in height, weight and BMI. From the results, BMI was about 36 kg/m² for females and about 38 kg/m² for the males group and this mean according to(**Weid , 2002**)who showed that BMI is most commonly used to measure body fatness and they reported that overweight (not obese), if BMI is 25.0 to 29.9. Class 1 (low-risk) obesity, if BMI is 30.0 to 34.9. Class 2 (moderate-risk) obesity, if BMI is 35.0 to 39.9. Class 3 (high-risk) obesity, if BMI is equal to or greater than 40.0. Some earlier studies have shown that excess adipose tissue may not protect against kidney diseases.

Table (3): Anthropometric Measurements for patient.

Anthropometric Measurements	Females	Males
Height (cm)	157.88 ±19.02 [b]	160.76 ±22.21 [a]
Weight (kg)	90.64 ±10.09 [b]	100.76 ±12.05 [a]
BMI(kg/m²)	34.33±8.93 [b]	39.36 ±9.98 [a]

Values are mean ± SD. Means under the same row bearing different superscript letters are different significantly ($p<0.05$).

The results of table (4) reported that food habits for the patients . In connection with main meal, the main meal was dinner which recorded (66.66%), (65.39%) for females and males respectively. 35.42% and 34.62% for males and males respectively were eating fruit. The majority of patients drunk soft and high caffeine beverages, the dinner was the main meal and all patients are having snacks. With regard to drink milk the higher percentage of the study sample from (87.5%), (86.54%) for females and males respectively wasn't drinking milk. Studies investigating the association between dairy intake and the risk of low BMD in adults in kidney diseases. One study observed a 1.7–3% lower hip BMD in young and postmenopausal patient with lower milk intake during childhood and adolescence. Studies have shown that over the past four decades, consumption of food eaten away from home has also risen

alarmingly. It is well known that eating out may lead to low calcium intake and increases the risk of kidney failure because of large portion sizes and increased energy density of foods (**Rosen and Bouxsein, 2006)**.

Table (4): Table (3): Food habits for patient .

Food habits		Females		Males	
		Frequency	Percent	Frequency	Percent
The main meal	Breakfast	2	4.17%	3	5.77%
	Lunch	14	29.17%	15	28.84%
	Dinner	32	66.66%	34	65.39%
Do you eating fruit	Yes	31	64.58%	34	65.38%
	No	17	35.42%	18	34.62%
Do you drink milk	Yes	6	12.5%	7	13.46%
	No	42	87.5%	45	86.54%
Do you drink	Tea	14	29.17%	16	30.77%
	Coffee	27	58.33%	19	36.54%
	Yansoon	6	12.5%	6	11.54%
	Soft drink	40	83.33%	37	71.15%
Do you have a snack	Yes	48	100%	52	100%

The results of table (5) showed all nutrients intake of the second group who was males were significantly higher than the first group who female .Protein, fiber, iron, calcium, magnesium and vitamins (C, B1, B2 and D) were lower in the both groups when compared with DRI while Zinc and vitamin A were decreased in the first group as compared with DRI and were lower than the second group. The other nutrients in both groups were higher than DRI. Severe calcium deficiency causes rickets in children and osteomalcia in adults, they are more likely to be caused by shortage of vitamin (D) than by a lack of calcium in the diet Vitamin (D) is necessary for the absorption of calcium. Excess of certain minerals (Fe, P, and K & Na) may cause intoxication. Damaged kidneys allow phosphorus, a mineral found in many foods, to build up in the blood. Too much phosphorus in the blood pulls calcium from the bones, making them weak and prone to breaking. Too much phosphorus may also make skin itch. For (Fe) caused nausea, vomiting, diarrhea, rapid, heartbeat, weak pulse, and shock, for excess (P) may draw calcium out of the body in being excreted, for (K): Muscular weakness and vomiting for (Na): edema and acute hypertension. Zinc deficiencies can lead to a variety of health effects, such as diarrhea, cold symptoms, rash, vision problems, or weight loss. They may also order other tests to rule out other conditions or vitamin deficiencies. The deficiency of vitamin (D) causes a vitamin (D) results in a failure to absorb calcium and softening

of the bones. In adults an inadequate supply of vitamin (D) causes osteomalacis. A deficiency of cyanocobalamin causes pernicious anemia of the recommendation there for much care should be given for the consumption of dairy products as rich sources in vitamin (D), and also calcium as well carrots as cheap source of carotene**(Thom et al.,2006).**

Table (5): The mean and standard deviation of nutrients intakes compared with RDI for patient

Nutrients intake	Females	DRI%	Males	DRI%
Energy (K.Cal/day)	2207.53 [b] ±22.04	109.07%	2631.20 [a] ±22.96	133.56%
Protein (g)	50.99 [b] ±10.43	81.51%	60.56 [a] ±10.76	92.30%
Total lipid (g)	71.17 [b] ±7.07	115.13%	80.39 [a] ±5.12	138.14%
Fiber (g)	4.82 [b] ±1.98	18.18%	5.09 [a] ±1.65	21.16%
Carbohydrate (g)	325.76 [b] ±14.32	250.27%	390.13 [a] ±12.87	300.48%
Na (mg)	1685.64 [b] ±24.54	110.04%	2098.5 [a] ±21.97	163.65%
K (mg)	1506 [b] ±20.54	330.19%	1901.63 [a] ±24.32	404.60%
Calcium (mg/d)	410.00 [b] ±21.76	51.07%	517.20 [a] ±16.96	52.92%
Phosphorus (mg/d)	814.52 [b] ±15.31	130.71%	964.07± [a] 32.94	166.37%
Magnesium (mg/d)	127.19 [b] ±21.33	45.11%	146.12 [a] ±9.32	55.33%
Fe (mg/d)	5.06 [a] ±0.86	71.00%	4.50 [b] ±0.99	90.01%
Zinc (mg/d)	6.09 [a] ±1.65	90.04%	6.90 [a] ±0.32	102.64%
Cu (mg)	750.87 [b] ±21.62	109.07%	900.76 [a] ±21.22	128.57%
Vitamin. A (mg/d)	430.34 [b] ±12.94	88.27%	565.41 [a] ±32.94	113.28%
Vitamin. C (mg/d)	42.52 [b] ±0.73	67.03%	50.79 [a] ±6.72	87.98%
Vitamin.B1 (mg/d)	0.78 [b] ±0.02	70%	0.93 [a] ±0.09	85.05%
Vitamin.B2 (mg/d)	0.65 [b] ±0.01	60%	0.815 [a] ±0.04	74.09%
Vitamin "D"IU	101.58 [b] ±5.94	17.06	200.27 [a] ±11.34	33.01
Selenium	81.01 [b] ±9.32	180.6%	90.79 [a] ±5.72	210.53%

Values are mean ± SD. Means under the same row bearing different superscript letters are different significantly ($p<0.05$).

Table (6): Medical analysis for patient with kidney failure. It was noticed that there were significant changes between the both groups in hemoglobin, serum calcium, phosphorus, urinary calcium and creatinine. While there is no significant between the both groups for the other medical analysis. Adequate intake of calcium is necessary to maintain

this balance. Calcium is absorbed in the small intestines with the aid of vitamin D. Excretion of calcium is primarily through the kidneys, although there is minor fecal loss [28]. Increased urinary calcium excretion and bone loss appear to be linked, and these subjects seem to suffer from a peculiar form of kidney failure. Consequently, urinary calcium excretion should be measured in osteoporotic patients in order to identify those patients reporting this specific alteration(**Bringhurst and Demay, 2005).**

Table (6): The mean and standard deviations of laboratory investigation for patient

Parameters	Females		Males	
	Mean± SD	Percentage of normal	Mean± SD	Percentage of normal
Hemoglobin(g/dl)	9.50 [b] ±1.54	70.25%	9.91 [a] ±1.53	74.15%
Serum protein(g/dl)	6.70 [a] ±0.55	95.71%	6.76 [a] ± 0.43	96.57%
Serum albumin (ALB) (g/dl)	2.53 [b] ±0.48	60.22%	1.92 [a] ± .45	49.1%
Serum calcium (mg/dl)	13.05 [b] ±1.04	133.15%	17.84 [a] ±2.37	180.38%
Zinc (μgm/100ml)	60.45 [a] ±6.06	53.16%	67.86 [a] ±.16	55.91%
Urinary calcium(mg/d)	224.65 [b] ±15.72	110.02%	270.92 [a] ±23.09	130.01%
S. phosphorus (mg/dl)	3.78 [b] ±1.79	80.9%	3.93 [a] ±0.02	99.19%
Creatinine	4.91 [b] ±0.07	120.1%	5.98 [a]±0.77	130.78%

Values are mean ± SD. Means under the same row bearing different superscript letters are different significantly ($p < 0.05$).

Conclusion

Eating the right foods and avoiding foods high in sodium, potassium, and phosphorus may prevent or delay some health problems from KF. People with KF have greater requirements for some water soluble vitamins. Special renal vitamins are usually prescribed to provide extra water soluble vitamins needed. Renal vitamins contain vitamins B1, B2, B6, B12, folic acid, niacin, pantothenic acid, biotin and a small dose of vitamin C.

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تقييم الحاله التغذويه لمرضي الفشل الكلوي الحاد بمستشفيات مركز اشمون

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الملخص العربي

يمكن أن يحدث مرض الكلى المزمن الذي يصيب ملايين الأشخاص كل عام ، نتيجة لأمراض وحالات صـحية مختلفة. يمكن أن يحدث أيضًا عندما يفشل المرضـى في تنـاول الأدوية الموصوفة للأمراض المزمنة أو بسبب الوضـع المالي السيئ الذي يمنع المرضـى من طلب العلاج. في كثير من الأحيان ، يمكن أن لا يتم تشخيصه بسبب سوء المتابعة الطبية من قبل المرضى الذين يعانون من حالات طبية مزمنة مثل السكري أو ارتفاع ضغط الدم. في هذه الدراسة ، عانى(100 مريض مصاب بالفشل الكلوي). تم تقسيم المشاركين إلى مجموعتين من الإناث (48 عضوًا) والذكور (52 عضوًا) ، وتم جمع بيانات البحث من خلال الاستبيان. تم تحديد القياسات البشرية (بما في ذلك الوزن والطول ومؤشر كتلة الجسم) والعادات الغذائية والحالة الصحية. أظهرت النتائج أن. كان العدد الإجمالي للعينات عند المتزوجين ، وكانت النسبة الأعلى لعينة الدراسة من الحضر ، وسجلت الحالة التعليمية أعلى نسبة للعينة كانت في القراءة والكتابة. كانت معظم العينات تعاني من السمنة. كان البروتين والألياف والكالسيوم والمغنيسيوم والفيتامينات (C و B1 و B2 و(D أقل في كلا المجموعتين عندما كانت العناصر الغذائية الأخرى في كلا المجموعتين أعلى من DRI. كانت هناك تغيرات معنوية بين المجموعتين في الهيموجلوبين والكالسيوم في الدم والفوسفور والكالسيوم البولي والكرياتينين بينما لا توجد دلالـه معنويـة بـين المجمـوعتين للتحاليـل الطبيـة الأخـرى. لـذا ، فـإن تنـاول الطعـام الصحي مهم إذا كان الشخص مصابًا بالفشل الكلوي. تمنح التغذية الجيدة الطاقة للقيام بالمهام اليومية ، وتمنع العدوى ، وتبني العضـلات وتحـافظ عليها ، وتساعدك على الحفاظ على وزن صحي للجسم ، يجب أن يحد النظام الغذائي الصديق للكلى مـن الصـوديوم ، والكوليسـترول، والدهون ، وبدلاً من ذلك يركز على الفواكه والخضروات ، الحبوب ومنتجات الألبان قليلـة الدسم واللحوم الخالية من الدهون.

الكلمـات المفتاحيـة: الفشل كلوي– ألامـلاح المعدنيـه– العـادات الغذائيـة – فيتامينـات– مؤشر كتلة الجسم