Diet Quality and Ureum, Creatinine Levels in Patients with Chronic Kidney Disease in the Patient Wards of General Hospital Fatmawati, South Jakarta

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Keywords: CKD, intake of protein, sodium, potassium, liquid, ureum and creatinine.

Abstract: Chronic kidney disease (CKD) is a condition in a decline renal function and progressive and irreversible. The intake of protein, sodium, potassium and liquid affect the performance of the kidney so that patients chronic kidney disease should pay attention to the intake. Ureum and creatinine is one parameter that is used as an assessment of renal function. This study to examine the relationship intake of protein, sodium, potassium, liquid and ureum, creatinine in patients with chronic kidney disease in the inpatient unit General Hospital Fatmawati, South Jakarta. This study used a cross-sectional study design, conducted research respondents as many as 36 people, aged 18-81 and above by way of accidental sampling. Based on the results of the study Most of the respondents classified the male sex, elderly age and the nutritional status of more. The ureumandcreatinine levels were relatively high. The average protein intake exceeds the protein requirements of respondents. There was a significant correlation between protein intake and levelsureum in patients with chronic kidney disease hospitalizations in Fatmawati Jakarta South. There was a significant relationship between the intake of protein and creatinine levels in patients with chronic kidney disease hospitalization in Fatmawati, South Jakarta. There was no significant correlation between the intake of sodium, potassium, liquid and ureum, creatinine level. Suggestion for a patient with chronic kidney disease needs to be a disciplined diet.

1 INTRODUCTION

Chronic Kidney Disease (CKD) is a state of the decline in kidney function that is irreversible. ChronicalCKDis characterized by a decrease in glomerular filtration rate during the last 3 months and no changes (Kresnawan, 2014). This resulted a decrease in renal function renal could not dispose of waste from the body, can not maintain the balance of liquids and body chemicals (Dharma, 2015).

The prevalence of CKD worldwide about 5-10% (Tjekyan, 2012). According to WHO data CKD has caused death in 850 thousand people each year. This figure shows that CKD was ranked the 12th highest cause of death world (Dharma, 2015). According to data from the year 2013 RISKESDAS highest prevalence was found in Sulawesi at 0.5%, followed by Aceh, Gorontalo and North Sulawesi as much as 0.4%. Meanwhile, NTT, South Sulawesi, Lampung,

West Java, Central Java, Yogyakarta and East Java as much as 0.3%. The prevalence of chronic kidney disease increased sharply in the age group 35-44 years as many as 0.3% of the 250 million population of Indonesia, followed by the age 45-54 years as much as 0.4%, age 55-74 years of as much as 0.5%, and the highest in the age group ≥ 75 years of as much as 0.6%. The prevalence in males is higher, as much as 0.3% than women is as much as 0.2%.

The level of creatinine in the blood is one of the parameters used to assess renal functionbecause the concentration in the plasma and the excretion in the urine within 24 hours is relatively constant. Creatinine levels in the blood that is not normal signaled their renal function impairment. Creatinine can be used to assess the ability of Glomerulus Filtrate Rate (GFR). Also, the high and low levels of blood creatinine will also give an idea of the severity of impaired renal function (Rustiana, 2015).

One of thecompilers of the human body are protein, a protein in the body is stored in the muscle. This muscle cell metabolism would be converted into creatinine in the blood. The kidneys will dispose

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of creatinine in the blood into the urine. If renal function decreases, creatinine levels in the blood will increase. This is why their relationship with creatinine levels of protein intake (IKAPI, 2007).

Ureum levels in the serum reflectthe balance between production and excretion. Stipulation method is to measure the nitrogen or often referred Blood Urea Nitrogen (BUN). BUN value increases when a person consumes large quantities of protein (Ma'shumah, 2014).

Research conducted Higashiyama, et al. in 2010 concluded that there is a significant relationship between protein intake and glomerular filtration rate or the effect on renal function.

Based on the results of research conducted by Ma'shumah (2014) demonstrate that there is a significant relationship between the intake of protein with ureum and creatinine levels in patients with chronic kidney disease.

The Medical Record General Hospital Fatmawati knew that cases of chronic kidney disease from November to December 2016 was Chronic Kidney Disease (CKD) Stage 1:1 person, CKD Stage 5 as many as 21 people, CKD Unspecified 19 people and End Stage Renal Disease (ESRD) 23 people. This case shows that the incidence of chronic kidney disease are still high, especially in urban.

2 RESEARCH METHODS

This research used cross-sectional design with accidental sampling technique. This research was conducted in Fatmawati, South Jakarta in January 2017. The population of research was all patients with chronic kidney disease who were diagnosed with Chronic Kidney Disease (CKD) stadium I through V with conservative therapy, cooperative in participating in this study, the age of 18-81 years and had been hospitalized at least a week. Before processing the data, first tested the normality using Shapiro - Wilk. In this research so that the data were not normally distributed statistical test using Spearman Rank.

3 RESULTS AND DISCUSSION

3.1 Primary Data

In this researchage groups were taken as respondents are, adults and the elderly, sex male and female, and nutritional status are grouped into less, normal and over. The frequency distribution of respondents by age groups, gender and nutritional status can be seen in Table 1 below:

Table 1. Distribution of the respondents according to ages, sex and nutritional status (Kemenkes, 2009)

Variable	n	%
Ages		
Adult (25 – 45 years)	4	11,1
Elderly (> 45 years)	32	88,9
TOTAL	36	100
Sex		
Man	21	58,3
Female	15	41,7
TOTAL	36	100
Nutritional Status		
Less	3	8,3
Normal	15	41,7
Over	18	50
TOTAL	36	100

Most of the respondents classified as the elderly age (> 45 years) as many as 32 people (88.9%) and the classified as mature age (25-45 years) as many as four people (11.1%). In this research, the youngest age found at the age of 29 years. This can be caused the increasing ages the decline in kidney function. Generally,the quality of life declines with increasing ages (Indonesian nursing, 2008). This occursespecially more than 45 years will be a process of the loss of some nephrons. The estimated decline in renal function is based on the ageing of each decade is 10ml / min / 1,73m2 means the same as has been the decline in renal function around the 10% of the ability of the kidneys. Based on data from Riskesdas 2013, the prevalence of chronic kidney disease increases with increasing ages, and rise sharply at the age above 35 years.

Gender of the respondents at this research are, man as much as 21 people (58.3%), and female as much as 15 people (41.7%). This can be due to lifestyle male patients who are not good, so the risk of developing chronic kidney disease tend to be more serious. According to the research results Benedict, et al. (2003) in Rustiana (2015) one of the serious risks to health are smoking. Smoking behavior population 15 years and over is still a

decline from 2007 to 2013 and is likely to increase from 34.2% in 2007 to 36.3% in 2013,and by gender, men reach 64.9% were still smoking and to kind female genital 2.1% still smoked cigarettes in 2013. Smokingbehavior causes a person at risk for developing chronic kidney disease were 2.2 times higher compared with individuals who did not smoke (Riskesdas, 2013).

Nutritional status in this research were divided into three categories,ie less as much as 3 people (8.3%), normal 15 people (41.7%) and over 18 (50%). In this research, the majority of respondents are nutritional status nutritional status. If the viewsfrom the diagnosis of chronic kidney disease were obtainedat this research is a complication of cardiovascular disease, diabetes mellitus, stroke and heart disease.

Nutritional status is a factor that should be considered in patients with chronic kidney disease because is one indicator of living a quality life. The method of taking the nutritional status data that is by measuring the weight and height of the respondents, and then determined their nutritional status.

Anthropometric measurementis considered an indicator of the status of the adequacy of energy and protein in patients with chronic kidney disease. Results of research conducted by Angraini, 2015 concluded that the proportion of malnourished research subjects was 16.3% (36 of 43). Results of research conducted by Sulistyowati nutritional status of patients with chronic kidney disease 3.8% categorized as underweight, normal 80.8%, and overweight 15.4% (Angraini, 2015).

Malnutrition is a major factor of morbidity and mortality in patients with chronic kidney disease and often occurs. Malnutrition can be caused due to intake of food that is not in accordance with the needs of both micro-nutrients and macro-nutrients.

Table 2: Distribution Protein intake, ureum and creatinine

Variables	Mean	SD	Min-Max
Protein intake (g)	58,07	14,11	42 - 100
Intake of Sodium (mg)	1420,99	208,07	1018 - 1789
Intake of Potassium (mg)	2004,36	339,60	1245 - 2532
Liquid intake (mL)	1922,99	169,75	1587 – 2433,6
Ureum (mg / dL)	127,05	52,14	50 - 250
Creatinine (mg / dL)	4,16	2,28	1,4 - 10
Needs Protein (g)	46,19	4,23	40 - 52
Needs Sodium (mg)	1297,22	102,77	1200 - 1500
Needs Potassium (mg)	2205,66	342,72	1365 - 2730
Liquid needs (mL)	1748,61	271,36	1250 - 2200

In this research the highest protein intake reaches 100 grams and the lowest protein intake are 42 grams and an average of 58.07 grams of protein intake. Average protein requirement respondents surveyed as many as 46.19 grams. Based on the results of research conducted, the average protein intake exceeds the protein requirements of respondents. Protein intake of respondents who studied not only from food and drink intake but no additional therapy such as additional parenteral octalbin, fujimin, aminoluid, clinimix, ivelip extra egg white or resulting complications of the disease which resulted in the occurrence of hipoalbumin.

Several sources of protein from foods consumed by inpatients with chronic kidney disease are fish, chicken, eggs, especially for patients with hypokalemia given once daily vegetable and commercial liquid foods such as hepatosol, nefrisol or Diabetasol.

The average intake of sodium respondents as many as 1420.99 ± 208.07 mg. From the results of the analysisshow, the lowest sodium intake is 1018 mg,and the highest sodium intake is 1789 mg. The average requirement of sodium is 1297.22 ± 102.77 mg with the needs of the lowest sodium is 1200 mg and the highest is 1500 mg. Calculation of sodium obtained through the consensus of nutrition on chronic kidney disease from PERNEFRI 2011 and obtained sodium intake through food weighing method and calculated the intake using Food Composition Tables Indonesia in 2009.

If the sodium levels in the blood increases, the kidneys remove it through the urine, and if low sodium levels in the blood, the kidneys will restrain spending. In this particular problem, the kidneys cannot excrete sodium, the sodium will accumulate in the blood. (Maria,et al., 2012).

Sodium intake in this research apart from food and drinks, there are also in patients with established therapies like drugs Bicnat and NaCl 0,9%. Sodium intake is obtained by calculating the intake through food weighing method and are added to the sodium intake of the drug and the infusion of respondents.

The average intake of sodium in the respondents of this research is 1420,99 mg higher than the average requirement was only reached 1297,22 mg. This study agrees with research conducted by Nagata et al, 2016 research on the *Association between 24 hour Urinary Sodium and Potassium Excretion and Estimated Glomerular Filtration Rate (eGFR) Decline or Death in Patients with Diabetes Melitus and eGFR more than 30ml/min/1,73 m*^{2} stated that the average intake of sodium in patients exceed their needs. Food sources containing sodium most consumed by the respondents are of the dry noodles, vermicelli, fish, chicken, eggs, bread and biscuits.

The average intake of potassium respondents as many as 2004,36 ± 208,07 mg. From the analysis, it can be seen that low potassium intake as much as 1245 mg and 2532 mg potassium intake high. Potassium intake was obtained by the method of weighing the food and was calculated using Food Composition Tables Indonesia in 2009. The average need for potassium respondents, 2205,66 ± 342,72 mg with the needs of the lowest potassium respondents, 1365 mg and 2730 mg highs. Potassium is the major intracellular cation. The concentration of potassium inside cells is about 150 mmol/L equivalent to 2700 mg, in the extracellular liquid as much as 4 mmol/L, equivalent to 72 mg (O'Callaghan, 2009).

Potassium easily absorbed in the small intestine. Potassium is consumed excreted through the urine, the rest is excreted through faeces and bit through sweat and gastric juices. The kidneys maintain normal blood potassium level through the ability to filter, absorb and emit potassium back under the influence of aldosterone. Potassium is issued in the form of replacing the sodium ions through ion exchange mechanism in the kidney. If renal function is impaired, the exchange will be disrupted and lead to increased potassium in the blood and the risk of heart failure. In patients with chronic kidney disease should be noted potassium intake in order not to aggravate kidney function.

The average intake of liquids respondents as many as 1922.99 ± 169.75 mL. From the analysis, it can be seen that its lowest liquid intake as much as 1587 ml of liquid intake and the highest 2433.6 ml. The needs of the average liquid respondents in this study is 1748.61 ± 271.36 mL premises liquid needs the lowest was 1250 mL and 2200 mL highest.

Liquid intake in patients with chronic kidney disease also need regulations that require special attention. Prevention of excess liquid needs to be done to prevent circulatory overload, edema and intoxication when lack of liquids will cause dehydration, hypotension and worsening kidney condition (Haryanti, 2015). Liquid intake calculated based on the amount of urine that comes out for 24 hours was added with water coming out through the excretion through sweat or breath which is about 500 ml.

In this research the average ureum 127,05 mg / dL. This is a very high ureum levels. Normal levels of ureum is 20-40 mg / dL. The results of this study together with the results of research conducted by Rachmawati in 2013 on her researchconcerning the relationship nutrition knowledge with the intake of energy, protein, phosphorus and potassium in patients with chronic kidney disease in Tugurejo hospitals Semarang said that the average level of ureum in the blood is high reaching 88,9% (of the total number of respondents 27 people).

Ureum is the end product of protein metabolism in the body that synthesized removed from the body. High levels of ureum in the blood that can not be removed from the body because of declining renal function can be toxic to the body. High levels of ureum in the blood is the result of many protein. Ureum is a product of the largest nitrogen released through the kidneys through food (Nabella, 2011).

In this research, the average serum creatinine level is 4,16 mg/dL,and creatinine levels were relatively high. Normal creatinine levels in the blood is 0,6 to 1,5 mg / dL. The results of this study are similar to studies conducted by Rachmawati in 2013 on her researchconcerning the relationship nutrition knowledge with the intake of energy, protein, phosphorus and potassium in patients with chronic kidney disease in hospitals Tugurejo Semarang said that the average levels of creatinine in the blood is high reaching 96, 3% (of the total number of respondents 27 people).

Examination of renal function is important to identify the presence of kidney disease. Examination of the best kidney function is by measuring Glomerular Filtration Rate (GFR) as assessed through renal clearance of a filtration marker. One of the markers used in clinical practitioners,i.e. serum creatinine (Riskesdas, 2013)

Serum creatinine cannot be used as a determining factor for kidney refugees someone as influenced by many things, among others, race, diet, age, sex, drug consumption. Increasing age a person can lower serum creatinine clearance depicting a decrease in kidney function. By gender, the proportion of men with abnormal serum creatinine levels three times higher than females (Riskesdas, 2013).

3.2 Relationship Analysis Protein, Sodium, Potassium, Liquid and Ureum, Creatinine

Table 3: Bivariate analysis of the relationship of protein intake, sodium, potassium, liquid and ureum, creatinine.

Variable	*p-value*	*r-value*
Protein - Ureum	0,015	0,402
Protein – Creatinine	0,001	0,529
Sodium – Ureum	0,896	0,023
Sodium - Creatinine	0,436	-0,134
Potassium – Ureum	0,318	-0,171
Potassium – Creatinine	0,802	0,043
Liquid – Ureum	0,230	0,205
Liquid - Creatinine	0,686	-0,070

3.2.1 Relationship between the Intake of Protein and Ureum, Creatinine

Based on the results of testing the relationship between the intake of protein and ureum using Rank Spearman test with the acquisition value of r count of 0,402 with a p-value (0,000) <α (0,05), so Ho rejected, which means that the higher the intake of protein eaten the higher the levels of ureum in blood. If seen from the test results can be concluded that increasing protein intake will increase the levels of creatinine in the blood. Based on these results it can be concluded that there is a significant relationship between the intake of protein and ureum levels in patients with chronic kidney disease hospitalizations in Fatmawati, South Jakarta.

The results of this research equal with research conducted by Ma'shumah, et al. (2014) about the relationship between protein intake with high levels of ureum, creatinine and blood haemoglobin levels in patients with chronic renal failure in hospital outpatients Tugurejo Semarang.

Based on the test results of the relationship between the intake of protein and creatinine levels using Rank Spearman test with the acquisition value of r count of 0,529 with a p-value (0.001) <α (0,05), so Ho rejected, which means when the protein intake increases the levels of creatinine in the blood will increase too. If seen from the test results there is a correlation where increased protein intake will result in increased creatinine also.

Based on these results it can be concluded that there is a significant relationship between the intake of protein and creatinine levels in patients with chronic kidney disease hospitalizations in Fatmawati, South Jakarta. The results of this research equal with research conducted by Nabella 2011 about the relationship of protein intake with high levels of ureum and creatinine in a bodybuilder.

3.2.2 Relationship between Intake of Sodium and Ureum, Creatinine

Results of testing the relationship between the intakeof sodium and ureum using Pearson Product Moment test with the acquisition count r-value of 0,023 with a p-value (0,896)> α (0,05), so Ho failed rejected. Based on these results it can be concluded that there was no significant association between the intake of sodium and ureum levels in patients with chronic kidney disease hospitalizations in Fatmawati, South Jakarta. Results of testing the relationship between the intake of sodium and creatinine levels using Spearman Rank test with the acquisition value of r-value of -0134 with a p-value (0,436)> α (0,05), so Ho failed rejected. Based on these results it can be concluded that there was no significant association between the intake of sodium and creatinine levels in patients with chronic kidney disease hospitalizations in Fatmawati, South Jakarta. Salt restriction is one of the strategies to optimize antihypertensive therapy and resolve edema. Broadly speaking sodium did not affect levels of ureum and creatinine. However, if the sodium in the blood increases, the kidney will be burdened to excrete excess sodium in the body. The excretion setting is done to maintain homeostasis (Yaswir, 2012).

3.2.3 Relationship between Intake of Potassium and Ureum, Creatinine

Results of testing the relationship between the intake of potassium and ureum using Pearson Product Moment test with the acquisition value of r_{count} equal - 0.1.71 with a p-value (0,318) > α (0,05), so Ho failed rejected. Based on these results it can be concluded that there was no significant association between the intake of potassium and ureum levels in patients with chronic kidney disease hospitalizations in Fatmawati, South Jakarta.

Results of testing the relationship between the intake of potassium and creatinine levels using Spearman Rank test with the acquisition value of r_{count} at 0,43 with a p-value (0,802) > α (0:05), so Ho failed rejected. Based on these results it can be

concluded that there was no significant association between the intake of potassium and creatinine levels in patients with chronic kidney disease hospitalizations in Fatmawati, South Jakarta.

Potassium imbalance is a serious disorder that can occur in patients with chronic kidney disease because the normal levels of potassium in the blood are only allowed in the range of 3,5 to 5,5 mEq. The kidney is the main regulator of potassium in the body that become levels remain in the blood by controlling excretion (Winarno, 1995).

Patients with chronic kidney disease risk increased potassium. Functions of potassium one is to maintain liquid balance in the body, nerve impulse transmission and muscle tension and helps the enzymes in energy metabolism (Maria, 2012).

The results of this study the same as those investigated by Rustiana (2015) concerning the relationship protein intake and intake of potassium to the levels of creatinine in patients with chronic renal failure in hospitals Sukoharjo, namely that there is no relationship between intake of potassium to creatinine values r_{count} = 0,280 with α = 0,05 means that there is no relationship between intake of potassium to creatinine levels.

3.2.4 The Relationship of Liquid Intake and Levels of Ureum, Creatinine

Results of testing the association between liquid intake and ureum using Pearson Product Moment test with the acquisition count r-value of 0,205 with a p-value (0,230)> α (0,05), so Ho failed rejected. Based on these results it can be concluded that there was no significant association between liquid intake and ureum levels in patients with chronic kidney disease hospitalizations in Fatmawati, South Jakarta.

Results of testing the association between liquid intake and creatinine levels using Spearman Rank test with the acquisition value of r count of -0,070 with a p-value (0.6.86)> α (0,05), so Ho failed rejected. Based on these results it can be concluded that there was no significant association between liquid intake and creatinine levels in patients with chronic kidney disease hospitalizations in Fatmawati, South Jakarta.

Liquid requirements calculated based on the amount of urine that comes out for 24 hours was added with water coming out of the sweat and breathing slightly more than 500 ml. Restriction of liquid intake in patients with chronic kidney disease are given according to the patient's condition is adjusted by the amount of urine produced plus IWL (insensible water Lost). It aims to prevent the occurrence of edema and cardiovascular complications (Rahman, 2014).

According Smeltzer & Bare (2013) explains that the ureum and creatinine are not excreted in excess liquid volume due to decreased renal perfusion and decreased excretion of metabolic waste and cause azotemia (elevated levels of nitrogen in the blood).

4 CONCLUSIONS AND SUGGESTION

4.1 Conclusion

There was a significant relationship of protein intake and levels of ureum, creatinine in patients with chronic kidney disease in the inpatient hospital Fatmawati, South Jakarta. There was no significant relationship between the intake of sodium and ureum creatinine in patients with chronic kidney disease in the general hospital inpatient center Fatmawati, South Jakarta. There is no significant relationship between the intake of potassium and ureum creatinine in patients with chronic kidney disease in the general hospital inpatient center Fatmawati, South Jakarta.Therewas no significant relationship between liquid intake and ureum creatinine in patients with chronic kidney disease in the general hospital inpatient center Fatmawati, South Jakarta.

4.2 Suggestion

For patients with chronic kidney disease patients need to be disciplined diet so as not to aggravate kidney. For hospital dietitians need to increase the role of nutritionists in motivating and monitoring food intake in patients with chronic kidney disease and the need for increased counseling to patients and their families in complying with the diet. For educational institutions there should be more research on the relationship of protein intake, sodium potassium and on levels of ureum, creatinine, albumin, sodium and potassium in the blood in patients with kidney disease in the inpatient unit kronilk with inspection methods BUN (Blood Urea Nitrogen).

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