



Characteristic Respondents with Creatinine Levels in Patients Undergoing Hemodialysis

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ABSTRACT

Kidneys have an important role in the body to maintain electrolyte composition, volume stability, and extracellular fluid. The important function of the kidneys is to filter the end products or waste products of the body's metabolism, for example creatinine. Creatinine level is a parameter of renal function, so it is necessary to know the patient characteristics related to creatinine levels. The purpose of this study was to analyze the relationship between the characteristics of age, sex, occupation and duration of hemodialysis with the creatinine levels of patients undergoing hemodialysis. This study used an analytic cross-sectional study design. The population of this study were 74 patients with chronic renal failure who underwent regular hemodialysis twice a week in Bangli Hospital. The sampling technique used was purposive sampling. Creatinine data is secondary data obtained from documents written in the Hemodialysis Room at Bangli Hospital. The occupation with creatinine levels ($p = 0.099$), sex with creatinine levels ($p = 0.094$), length of hemodialysis with creatinine levels ($p = 0.406$), age with creatinine levels ($p = 0.046$). There is a relationship between age characteristics and creatinine levels in patients undergoing hemodialysis.

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Kata kunci:

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ABSTRAK

Ginjal memiliki peran penting dalam tubuh untuk menjaga komposisi elektrolit, kestabilan volume, dan cairan ekstraseluler. Fungsi penting ginjal adalah menyaring produk akhir atau produk sisa metabolisme tubuh, misalnya kreatinin. Kadar kreatinin merupakan salah satu parameter fungsi ginjal, sehingga perlu diketahui karakteristik penderita yang berkaitan dengan kadar kreatinin. Tujuan penelitian ini adalah untuk menganalisis hubungan karakteristik umur, jenis kelamin, pekerjaan dan lama hemodialisis dengan kadar kreatinin pasien yang menjalani hemodialisis. Penelitian ini menggunakan desain penelitian cross-sectional analitik. Populasi penelitian ini adalah 74 pasien gagal ginjal kronik yang menjalani hemodialisis rutin dua kali seminggu di RSUD Bangli. Teknik pengambilan sampel yang digunakan adalah purposive sampling. Data kreatinin merupakan data sekunder yang diperoleh dari dokumen yang tertulis di Ruang Hemodialisis RSUD Bangli. Pekerjaan dengan kadar kreatinin ($p = 0,099$), jenis kelamin dengan kadar kreatinin ($p = 0,094$), lama hemodialisis dengan kadar kreatinin ($p = 0,406$), usia dengan kadar kreatinin ($p = 0,046$). Ada hubungan karakteristik usia dengan kadar kreatinin pada pasien yang menjalani hemodialisis.

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INTRODUCTION

The kidneys have an important role in the body to maintain electrolyte composition, volume stability and extracellular fluid. An important function of the kidneys is to filter the end products or waste products of the body's metabolism, such as creatinine, if metabolic waste accumulates in the body, then these substances can become toxic in the body, especially in the kidneys. There are several causes for increased serum creatinine levels, namely kidney disease, excessive fatigue, kidney dysfunction accompanied by infection, use of drugs that are toxic to the kidneys, dehydration, and uncontrolled hypertension. Kidney function can be assisted in creatinine testing, if the kidneys fail, the creatinine will increase, so dialysis medication or a kidney transplant is absolutely necessary (Nuratmini, 2019). Chronic kidney failure is one of the incidence of disease that is a health problem around the world, this disease has increased every year, the occurrence of kidney failure causes the risk of heart and blood vessel disease and increases mortality (Setyaningsih, Puspita, & Rosyidi, 2019). Approximately 1 in 10 of the world's population is identified as having chronic kidney problems. According to the Ministry of Health (2018) BPJS Kesehatan Indonesia, kidney disease is second only to heart disease.

Creatinine is a normal product of muscle metabolism and is excreted in fairly constant levels, regardless of factors, such as fluid intake, diet and exercise (Nurarif & Kusuma, 2015). Creatinine is found in muscles, brain, and in the blood in a phosphorylated form as phosphocreatine. Very little amount of creatinine is present in normal urine. Creatinine is transported through the bloodstream to the kidneys. Then the kidneys filter most of the creatinine and excrete it into the urine. Creatinine levels will change in response to kidney dysfunction. Serum creatinine will increase with decreased glomerular filtering ability. Serum creatinine levels reflect the most sensitive kidney damage because it is produced constantly by the body (D.G.A Suryawan, Arjani, & I G Sudarmanto, 2016). From this description, creatinine level is a parameter of kidney function, so it is necessary to know the

patient characteristics related to creatinine levels. The purpose of this study was to analyze the relationship between the characteristics of age, gender, occupation and long-term of hemodialysis with the creatinine levels of patients undergoing hemodialysis.

METHOD

Research participants

The population of this study were 74 patients with CRF who undergoing regular HD twice a week in Bangli Hospital. The sampling technique used was purposive sampling.

Research procedure

This study used an analytic cross-sectional study design to determine the relationship between patient characteristics and creatinine levels in patients undergoing hemodialysis. This study first asked permission to the education and training department, then the head of the hemodialysis room to ask for the latest patient creatinine data.

Instrument

Creatinine data is secondary data obtained from documents written in the HD Room at Bangli Hospital. The data that has been collected is then tabulated into a data collection matrix that has been made by the researcher.

Data analysis

The data can be described using descriptive statistics and to determine the relationship between patient characteristics and creatinine levels using the Pearson Spearman parametric statistical test.

RESULTS AND DISCUSSION

Table 1. Characteristic respondents in Hemodialysis Room Bangli Hospital 2020

| Characteristics | (n) | (%) |
|------------------------|-----|------|
| Age (years old) | | |
| Early teens (12-16) | 1 | 1,3 |
| Late teens (17-25) | 3 | 4,05 |
| Early adult (26-35) | 4 | 5,4 |
| Late adult (36-45) | 15 | 20,3 |
| Early elderly (46-55) | 20 | 27,0 |
| Late elderly (56-65) | 17 | 22,9 |
| Elderly (>65) | 14 | 18,9 |
| Gender | | |
| Male | 48 | 64,9 |
| Female | 26 | 35,1 |
| Occupation | | |
| Unemployment | 20 | 27,0 |
| Government employees | 11 | 14,9 |
| Farmer | 12 | 16,2 |
| Housewife | 7 | 9,5 |
| Trader | 1 | 1,4 |

| | | |
|--------------------------|----|------|
| Entrepreneur | 23 | 31,1 |
| Long-term (years) | | |
| 0-1 | 14 | 18,9 |
| 1-5 | 38 | 51,4 |
| 5-10 | 22 | 29,7 |

Based on table 1, it is known that most of the patients with Chronic Renal Failure are patients with early elderly, namely 46-55 years (27.0%). Gender characteristics, most of the patients with Chronic Renal Failure were male (64.9%). Occupational

characteristics, most of the patients with Chronic Renal Failure are patients who are private jobs (31.1%). Characteristics of the length of time the respondents have undergone HD, most of the respondents who have undergone HD are 1-5 years (51.4%).

Table 2. Creatinine level patient undergoing hemodialysis

| Creatinine level | n | % | Mean±SD |
|------------------|----|------|-----------|
| Low | 0 | 0 | |
| Normal | 1 | 1,4 | 5,44±2,54 |
| High | 73 | 98,6 | |
| Total | 74 | 100 | |

Based on the research results, it was obtained that the creatinine level of most respondents had high levels (98.6%), and there were (1.4%) had normal creatinine levels. The highest creatinine level was 17.22 mg / dL, the lowest was 1.14 mg / dL.

diligently but drinking supplements, so it is necessary to have the patient's self-awareness to regulate the right food to maintain creatinine levels during hemodialysis therapy.

**Table 3
 Results p value**

| Characteristics | p value |
|-----------------|---------|
| Gender | 0,099 |
| Occupation | 0,094 |
| Age | 0,046 |
| Long term HD | 0,406 |

Based on the examination of creatinine levels before undergoing HD in 74 patients with Chronic Renal Failure, based on the examination of creatinine levels after undergoing HD in 74 patients with Chronic Renal Failure, it is known that some private worker respondents have high creatinine levels (96.5%). One of the factors for increasing creatinine levels in patients with chronic kidney failure is excessive physical activity, excessive muscle mass results in increased creatinine levels in the glomeruli, this results in the kidneys being unable to function properly, so hemodialysis therapy is needed, this can be seen from the results of research that stated that more kidney failure patients are still working, namely workers. The more the patient forces himself to work, the muscle mass progresses slowly with a decrease in kidney function, if kidney function decreases, the creatinine level increases (Isnabella, 2017). Based on research conducted at the Hemodialysis Unit at Bangli Hospital, Bangli Regency, it is known that the length of time for chronic kidney failure patients undergoing hemodialysis therapy, most of the respondents whose HD duration is 1-5 years have high creatinine levels (100%). In line with the research (Daryaswanti, 2019) most of the people who underwent HD were less than 5 years old. The creatinine level examination of patients with Chronic Renal Failure in this study was carried out by the patient undergoing the first hemodialysis therapy in that month. Creatinine levels in patients with Chronic Renal Failure are within normal limits <0.5 mg / dl. Based on the research, it is known that there is no decrease in creatinine levels in patients with chronic renal failure after undergoing hemodialysis therapy, with an average hemoglobin level of 98.6%.

After the analysis, it can be seen that there is no work relationship with creatinine levels (p = 0.099), there is no gender relationship with creatinine levels (p = 0.094), there is no long-term relationship between HD and creatinine levels (p = 0.406), but there is a relationship. age characteristics with creatinine levels (p = 0.046).

These results are in line with those conveyed by (Nuratmini, 2019) in patients with Chronic Renal Failure before undergoing hemodialysis therapy, their creatinine levels experienced an abnormal increase. But routinely undergoing hemodialysis therapy did not show a decrease in creatinine levels back to normal levels. experience an increase in impaired erythropoietin production which causes erythropoietin deficiency and erythropoietin death early. Hemodialysis therapy does not completely help replace renal function, although patients undergo routine hemodialysis therapy, hemodialysis therapy is limited to controlling uremia symptoms and maintaining patient survival and maintaining renal function in patients with chronic renal

DISCUSSION

Based on the examination of creatinine levels after undergoing HD in 74 patients with Chronic Renal Failure, it is known that most patients in the early elderly age range (46-55 years) have high creatinine levels (100%). This is in line with research conducted by (Nuratmini, 2019). Patients with chronic kidney failure, the elderly are more influenced by lifestyle, stress, fatigue / excessive visual activity, energy drinking habits, consumption of supplemental drinks and lack of drinking water are factors that trigger chronic kidney failure. Based on the examination of creatinine levels after undergoing HD in 74 patients with Chronic Renal Failure, it is known that most of the high creatinine levels were found in male patients (100%). This is in line with the research conducted by (Yudhawati, Supriati, & Wihastuti, 2019) that more men experience chronic kidney failure as many as 61 people (53.3%). Meanwhile, normal creatinine levels after HD were found in the male sex, amounting to 1 person (2.1%). This is in line with research conducted by (Paramita, 2019) that creatinine levels are above normal in men due to an unhealthy lifestyle that is applied every day, such as dietary patterns in patients with chronic kidney failure, usually men forget not to smoke. , drinking alcohol, not exercising

failure. Based on research conducted at the Hemodialysis Unit at Bangli Hospital, Bangli Regency, it is known that Chronic Kidney Failure patients undergo hemodialysis therapy. Based on secondary data collected regarding creatinine levels after undergoing HD, most patients still have high creatinine levels (98,6 %).

This creatinine level needs to be monitored as an indicator of kidney damage and this examination is carried out every time you undergo HD therapy, it appears that the creatinine levels of patients who are going to undergo HD therapy are changing, even exceeding normal levels. High creatinine levels after hemodialysis therapy can be caused by the large creatinine molecular weight of 113-Da (Dalton), so that it is difficult for creatinine molecules to be eliminated from the bloodstream during the hemodialysis process. Hemodialysis therapy is able to reduce creatinine levels in the blood but is unable to clear creatinine adequately so that levels depend on muscle mass. The normal value of creatinine levels in men is 0.6-1.4 mg / dL while in women 0.5-1.2 mg / dL (Dugdale, 2013).

By the age of 60 years, the number of kidney nephrons will decrease due to damage. Therefore, kidney function will decrease. The reduced number of nephrons causes the remaining nephrons to take over the function of the damaged nephrons, so that the work of the remaining nephrons is getting heavier. This is one of the factors in the occurrence of chronic kidney failure. Based on the results of the study, that in the elderly the creatinine levels were higher than the younger ones. To determine the status of an elderly person, the appropriate reference values must be used. Reports show that older people have higher serum creatinine concentrations than young adults. Whether this increase is an actual effect of aging or due to an increased incidence of disease with increasing age is debated (Tiao, Semmens, Masarei, & Michael, 2002).

Limitation of The Study

The limitation of this study was that it was conducted in one hospital, so it cannot be generalized.

CONCLUSIONS

The number of kidney nephrons will decrease due to damage. The reduced number of nephrons causes the remaining nephrons to take over the function of the damaged nephrons, so that the work of the remaining nephrons is getting heavier. This is one of the factors in the occurrence of chronic kidney failure. Based on the results of the study, that in the elderly the creatinine levels were higher than the younger ones.

Conflict of Interest

The authors report no actual or potential conflicts of interest.

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