THE DIFFERENCES OF UREUM LEVELS IN HEMODIALYZED PATIENTS CONSUMING RO WATER AND ALKALINE WATER

by Anrika Rahman

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THE DIFFERENCES OF UREUM LEVELS IN HEMODIALYZED PATIENTS CONSUMING RO WATER AND ALKALINE WATER

Susiwati[1], Muhammad Parezal Lastialno[2]
[1,2]Department of Medical Laboratory Technology, Politeknik Kesehatan Kementerian Kesehatan Bengkulu, Indonesia
Corresponding email: susiwati@poltekkesbengkulu.ac.id

Abstract

Kidneys plays an important role in the metabolism of the body such as excretion function, water and electrolyte balance, as well as endocrine. If there is kidney damage or unfunctional, then one of the ways that can be done is to undergo Hemodialysis therapy. Hemodialysis patients should limit their fluid needs. By limiting fluids in hemodialysis patients can balance body fluids so that kidney function can run well. The purpose of this study is to find out the difference in ureum levels in hemodialysis patients who consume RO water with alkaline water. This research was a quantitative design of quasy experimental method with one group pretest post test design. The population of this study were 158 patients who routinely undergo hemodialysis in the hemodialysis unit of RSUD M Yunus, Bengkulu Province. The samples were 15 patients including to inclusion criteria that taken by purposive sampling method. Data was processed and analyzed statistically with Wilcoxon and Mann-Whitney tests. The result showed there was difference in ureum levels in hemodialysis patients before and after consuming RO water and differences in ureum levels in hemodialysis patients before and after consuming alkaline water. Although there was no significant statistical difference but alkaline water shows a decrease in average so the results of the study are still meaningful. The authors suggest that input and output in hemodialysis patients may affect ureum levels in the blood so that patients are expected to drink no more than the specified amount of water.

Key Words: *Kidney failure, ureum, hemodialysis, alkaline water*

INTRODUCTION

Chronic kidney failure was a condition or condition characterized by a decrease in the glomerular filtration rate (GFR) and an increase in albumin levels in the urine (Hartini, 2016). Chronic kidney failure causes the kidneys to decline until the kidneys are unable to function properly. Kidney disease outcomes quality initiative divides CKD into 5 stages based on the GFR where end stage renal disease is the final stage of CKD which is characterized by permanent and irreversible kidney damage (Hartini, 2016).

Data World Health Organization (WHO) in 2015 showed 1.2 million people died from kidney failure, an increase of 32% since 2005 (WHO, 2018). While in Indonesia, the prevalence of chronic kidney disease based on a doctor's diagnosis in the population aged 15 years showed that in 2013 as many as 0.2% of the Indonesian population had chronic kidney disease and increased to 0.38% in 2018 (RISKESDAS, 2018), in Bengkulu Province alone, 0.43% of

the population living in Bengkulu Province experienced chronic kidney failure (RISKESDAS Bengkulu, 2018). The individuals who have reached this stage should require renal function replacement therapy. Renal function replacement therapy such as hemodialysis therapy (Hartini, 2016).

Hemodialysis is a membrane or semi-permeable membrane. This membrane can be passed by water and certain substances or waste substances. This process is called dialysis, which is the process of moving water or substances through semi-permeable membrane. Hemodialysis is a high-tech replacement therapy that removes metabolic wastes from the bloodstream via diffusion, osmosis, and ultra filtration across a semipermeable membrane in an artificial kidney (Nurani & Mariyanti 2013). Urea is an example of the end product of protein metabolism in the body which is produced by the liver and excreted in the urine. In impaired renal excretion, the excretion of urea into the urine is inhibited so that urea levels increase in the blood (Indrasari, 2015).

Measurement of serum urea can be used to evaluate kidney function, hydration status, assess nitrogen balance, assess progression of kidney disease, and assess hemodialysis results. An increase in urea in the blood is called azotemia. The condition of kidney failure which is characterized by very high plasma urea levels is known as uremia. This situation can be dangerous and requires hemodialysis or kidney transplantation (Verdiansyah, 2016).

Kidneys need enough fluids to clean or get rid of what is not needed in the body. Drinking a lot will certainly cause frequent urination. Furthermore, it can remove a lot of dirt or waste and toxins from the kidneys. In addition, the quality of drinking water must be clean and healthy. Consuming drinking water sufficiently and not excessively, which is no more than 0.03 liters per kg body weight (Hartini, 2016). Water is an important part of life, most of our body consists of water. Water serves to transport minerals, vitamins, proteins and other nutrients throughout the body. The balance of body temperature will be very dependent on water, because water is a lubricant for body tissues as well as bearing joints, bones, and muscles (Nikmawati, 2008). Water is also an intermediary for transporting nutrients, gases and wastes as well as for all the biochemical reactions of cells and tissues in the human body. Water is important for maintaining normal blood volume internally to the cardiovascular system for continued activity. Evaporation of water from the skin and breathing water into the air from the lungs are important for regulating human body temperature. In addition, water also acts as a lubricant in the process of digestion and absorption (Bin et al., 2007).

Reverse Osmosis (RO) water is a type of drinking water that has a higher oxygen content and smaller molecules than boiled water. Water that contains more oxygen is important for humans. This is because the oxygen content in the water is absorbed through the digestive system which will provide more oxygen to the body to increase metabolism in our body. With high oxygenated water, the absorption rate of vitamins, minerals and other nutrients in the body will be better. Oxygen in water can also help us improve brain function so we can think better (Bin et al., 2007).

Alkaline water, containing large amounts of OH or hydroxyl. It is water soluble in oxygen. Many of us are still confused between oxygen and dissolved oxygen. Compressed oxygen is oxygen gas contained in water. Meanwhile, dissolved oxygen is a variable form of OH and is weakly bound to alkaline minerals. When OH is brought to the cellular level, it will be converted into free oxygen and supplied directly to the cells. The compressed oxygen in plain water is impractical for humans or fish. Cells in the human body cannot absorb oxygen directly from water through the stomach or intestines (Bin et al., 2007).

METHOD

Research Design and Subject

This research was a quantitative design study with the quasy experimental method with one group pretest post test designs. The research was conducted by giving treatment or intervention twice to one or more groups which aims to determine the consequences of the intervention or treatment (Masturoh & Anggita, 2018).

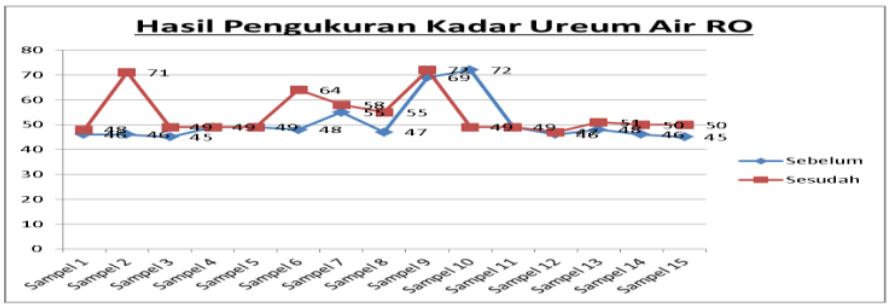
The population of this study were patients who routinely undergo hemodialysis in the hemodialysis unit of RSUD M Yunus, Bengkulu Province, amounting to 158 patients. The sampling method used is the purposive sampling method, namely the sampling is intentionally in accordance with the required sample requirements (Masturoh & Anggita, 2018), in the implementation of the study which amounted to 15 people and according to the inclusion criteria.

Instruments and Data Analysis Techniques

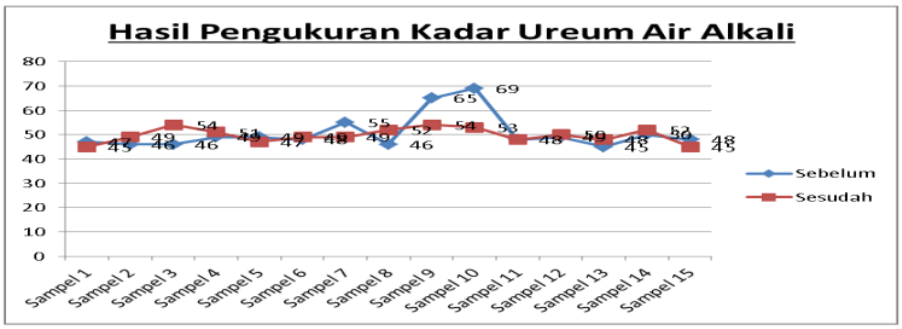
Data were collected using observation sheets on the results of blood laboratory examinations including urea levels in patients. All data obtained were processed and analyzed statistically with the Wilcoxon and Mann-Whitney test

RESULTS

The results of measuring blood urea levels before and after consuming RO water in hemodialysis patients at M. Yunus Hospital, Bengkulu Province presented in Grafics below.



The results of measuring urea levels in hemodialysis patients who consume RO water at RSUD M Yunus, Bengkulu Province showed here is an increase, decrease, and the same between the pre test and post test.



The measurement of urea levels in hemodialysis patients who consume alkaline water at RSUD M Yunus Bengkulu Province, samples 1 to 15 are also almost the same. The results of the measurements before and after the treatment also varied, there was an increase, a decrease, and the same between the pre test and post test.

Differences in urea levels in hemodialysis patients after consuming RO water and alkaline water at RSUD M Yunus, Bengkulu Province presented in Table 1 below:

Table 1. Differences in urea levels in hemodialysis patients after consuming RO water and alkaline water at RSUD M Yunus, Bengkulu Province

	n	Median (minimum-maximum)	Average ±s.b.	p
Urea level after consuming RO water	15	50 (47-72)	50,07±8,37	0,24
Urea level afterconsuming Alkali water	15	49 (45-54)	49,73±2,92	

Based on the Table 1, it can be seen that the median value of urea levels after consuming RO water is 50 mg/dl with a minimum and maximum value of 47 mg/dl and 72 mg/dl and the median value of urea levels after consuming alkaline water is 49 mg/dl with a value of 49 mg/dl minimum and maximum of 45 mg/dl and 54 mg/dl. The results of statistical tests using the Mann-Whitney test obtained a p value of 0.24, meaning that there was no difference in urea levels in hemodialysis patients after consuming RO water and after consuming alkaline water at RSUD M. Yunus, Bengkulu Province.

DISCUSSION

Differences in urea levels in hemodialysis patients before and after consuming RO water at M Yunus Hospital, Bengkulu Province. Based on statistical tests, it was obtained that the p value was 0.028, which means that there was a significant difference before and after consuming RO water. This can be seen from the results of the examination which showed an increase in 11 samples, 1 decrease, and 3 remained constant from all 15 samples and also the average which showed an increase from 50 mg/dl to 54 mg/dl. This can be caused by a disturbance in the acid and base balance, considering that RO water itself is water with an acidic pH below 7 so that it can cause acidosis resulting in a buildup of urine crystals which can cause an increase in urea levels plus lg because of hemodialysis patients whose kidneys are not functioning properly anymore. so that it can burden the work of the kidneys which can cause an increase in urea levels (Kusumayanti et al., 2007).

Differences in urea levels in hemodialysis patients before and after consuming alkaline water at M Yunus Hospital, Bengkulu Province. Based on statistical tests, it was found that the p value was 0.9, which means that there was no significant difference before and after consuming alkaline water. However, the average showed a decrease from 50 mg/dl to 49 mg/dl, which means that the

alkaline water drunk is still significant. This can be seen from the results of the examination which showed a decrease of 6 samples from the total sample of 15 samples. Acidity levels that are too high can cause crystals to appear in the kidney area, another trigger is uric acid (Kusumayanti et al., 2007). One way to avoid this is to make the urine alkaline. This is done by drinking alkaline so that the body does not experience acidosis and the excretion of these crystals in the urine is not hampered so that it can prevent kidney stones and a decrease in urea levels occurs. This is in accordance with a study conducted by Naila Shulya, 2007 that alkaline water can increase urine pH although it is not statistically significant (Naila Shulya Ellyana et al., 2011). The increase that occurs can be caused by respondents' drinking water that is not in accordance with their daily needs, causing excess fluid intake which can increase urea levels (Saniyaty et al., 2015).

The last statistical test was carried out to see the difference in urea levels in hemodialysis patients after consuming RO water and alkaline water at M Yunus Hospital, Bengkulu Province. The p-value of 0.240 means that there is no significant difference from the results of measuring urea levels in hemodialysis patients who consume RO water and alkaline water so that neither type of water is more effective in reducing urea levels in hemodialysis patients. And it is recommended to drink plain water. However, as an option, you can drink alkaline water because although it is not very significant, the statistical test on average shows that alkaline water can reduce urea levels. In addition, all the results obtained during the study according to the authors can also be influenced by the compliance of the respondents themselves in following the research course, especially during the alkaline water and RO intervention so that it can affect the results of the study. It is also possible that this study did not get maximum results due to the short time of administration or intervention of alkaline water and RO so that the results of this study were not optimal.

CONCLUSIONS AND SUGGESTIONS

The conclusions of this study consist of: (1) There is a significant difference in the results of measuring urea levels in hemodialysis patients; (2) There is no significant difference in the results of measuring urea levels in hemodialysis patients before and after consuming alkaline water, and (3) There is no significant difference in the measurement results of urea levels in hemodialysis patients after consuming RO water and alkaline water. Based on conclusion, It is suggested that input and output in hemodialysis patients can affect urea levels in the blood so that patients are expected for further research, respondents are emphasized to drink water no more than the amount that has been determined.

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