

Conference Paper

The Influence of Hemodialysis Adequacy on the Blood Urea Value

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Abstract

Hemodialysis is one of the substitutional renal therapies given to chronic renal clients who are experiencing terminal stage or *end-stage Renal Diseases (ESRD)*. In Indonesia, there are 655 renal units and 433 among them have sent the data to *Indonesia Renal Registry (IRR)*. There are 77,892 clients who do hemodialysis therapy actively. Therefore, among them, 30,831 are new clients who have just started taking the therapy. Hemodialysis is a therapy to get rid of the toxic, water and soluble essence from the blood in clients who have ESRD. The success of hemodialysis can be known from the HD adequacy. The research aims to identify the influence of hemodialysis adequacy on the blood urea value and the research was conducted at the TK.II Dustira Cimahi Hospital. The research used quantitative with different tests. Ninety respondents were involved in the research by using a convenience sampling technique. Adequacy HD was calculated by using a calculator online KT/V and blood urea was obtained from the medical record of secondary data from the laboratory checking the pre and post HD urea blood. Analysis data used paired t-test. The research result showed that HD adequacy average was 1,27 and the urea average of pre HD was 165 mg/dl, furthermore the average of post urea HD was 59,93 mg/dl. The result of the analysis with *paired t-test* showed that there is an influence of hemodialysis adequacy on the blood urea value with p-value = 0,00 ($p < 0,05$). Therefore, it can be concluded that there is an influence of hemodialysis adequacy towards the blood urea value. The suggestion for the renal unit is to increase the HD adequacy that aims to reduce blood urea value.

Keywords: Adequacy, Hemodialysis, blood Urea

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1. Introduction

Chronic renal disease (CRD) in the last stadium or End Stage Renal disease (ESRD) is a process of renal function decreasing progressively and irreversible up to the renal is not able to maintain the balance of metabolic, liquid, and electrolyte that cause of azotemia and uremia establishment (Wein., Kavoussi., Novick., Partin., Peters, 2007., Smeltzer & Bare, 2004 dalam Bayhakki, 2013). The prevalence have ever or are being running the dialysis in Indonesia occur on citizens whose age at ≥ 15 years old as many as 19,3% from citizen who ever diagnosed by PGK(RisKesda, 2018). West Java

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is one of provinces which sent the data much about renal dialysis patients were as many as 7.444 people and active patients were 21.051 people (IRR, 2017). The Patients who had ESRD such as the renal function less than 15% were suggested to run dialysis therapy program. The therapy reduces the rest of urea in the blood and there are two method to measure the HD effectiveness that namely HD adequacy, it is by calculating Urea reduction Rate(URR) and urea reducing scale in any liquid on patient body during HD(Kt/V). HD adequacy score that recommended $URR \geq 65\%$ and score of $KT/V \geq 1,2$ (Daugirdas., Blake, Ing, 2007). According to Aisara dkk (2018), on her research showed that clinical symptom much experienced by ESRD sufferers who running the dialysis such as weak, fatigue, and weary as many as (30,8%), nausea (12,5%), Vomits (7,7%), less of appetite (13,5%), insomnia(11,5%) and itching(1%). It happened because of the blood urea rate increasing. The patient implementation of ESRD with renal function $<15\%$ who running dialysis need to be focused on its HD adequacy, it is as effort to reduce blood urea degree, so that the symptoms were felt by the patients to be reduce moreover be normal(Daugirdas., Blake, Ing, 2007). Based on the background above, the writer did the research about the influence of hemodialysis adequacy toward the blood urea value.

2. Method

2.1. Sort of research

The research is a comparative quantitative study and studied at TK.II Dustira Cimahi Hospital.

2.2. Population

Population in this research were ESRD patient who running dialysis therapy. The researcher implemented *convenience sampling technique*. Inclusion criteria was used in this research is dialysis patients in good condition, compos mentis, stabile, and could make verbal or oral communication and also aged > 17 years old had a will be respondents.

It so happen, the inclusion criteria in this research is patients with other condition or disease that disturbed the scale of degree or the result of interpretation such as mental disorder. In this case the patients with condition or disease sample scale calculated by using *Software G*Power 3.1.9.2*. Moreover by using *t test* and *statistical test* namely

correlation point biserial model with assumption $\alpha=0.05$, *medium effect size*= 0.3, *power level*= 0.8. The total of samples scale was 82 people. But to hide from margin error was added 10% so that the samples who recruited as many as 90 people.

2.3. Instrument

The instrument used to measure HD adequacy was HD adequacy online calculator to take blood urea secondary value before and after HD, ultra filtration volume, weight post HD, duration time HD.

2.4. Procedure of data collecting

The permit to do the research had been given by the hospital and had been done the ethic study. The researcher found the respondents accordance to the criteria requirement. The patients fulfilled the criteria had been given explanation about the research aims and asked to fill out the informed consent sheets, and then taking secondary data toward blood urea value after and before doing the HD, ultra filtrasi volume, weigh post HD, duration time of HD. After that using HD adequacy online calculator to calculate HD adequacy score by inserting urea score ore and post HD, weight post HD, ultra filtrasi, and duration time of HD as well. As the result, HD adequacy score had been found.

2.5. Data analysis

Univariate analysis was used in this research to know HD adequacy rate score and pre and post HD blood urea score.

Bivariate analysis to know the HD adequacy effect toward blood urea score on ESRD patients who had dialysis therapy by using *paired t test*. The researcher took attention on research ethic requirements such as, *Informed Consent*, *NonMaleficence*, *Confidentiality*, *Veracity*, dan *Justice*..

2.6. Result

There were as many as 90 respondents in this research. The research result is as follows,

TABLE 1: Characteristic of Responden (n=90).

Characteristic	Frequency (n)	Percentage (%)
Gender		
Male	46	51,1
Female	44	48,9
Age		
< 40	20	22,2
40– 60	55	61,1
>60	15	16,7
Long of Hemodialisa		
<12 month	34	37,8
12 – 24 month	17	18,9
> 24 month	39	43,3
Total	90	100,0%

TABLE 2: The overview of HD adequacy rates, urea score on pre and post of HD(n=90).

Variable	Mean ± deviation standard
Adequacy HD	1.27 ± 0,32
Blood Urea pre HD	165.20 ± 52.42
Blood Urea post HD	59.93 ± 27.45

From the table above, it is able to see the HD adequacy rates was 1,27, for blood urea score rates before HD was HD 165.20, and also blood urea rates score after HD 59.93.

TABLE 3: The influence of HD adequacy toward blood urea score (n=90).

Variable	Mean ± deviation standard	p-value
Adequasi HD	1.27 ± 0,32	
Blood Ureu Pre Test	165.20 ± 52.42	.000
Blood Ureu Post Test	59.93 ± 27.45	

Based on data above, it showed that there was influence of HD adequacy toward blood urea score before and after doing HD with *p-value* 0,000 <α=0.05.

3. Explanation

Accordance to bivariate analysis result with *paired t-test* showed there is the influence of HD adequacy toward blood urea score with *p-value* 0,000 <α (α=0.05). the clinical overview on PGK patients will be seen in reality if blood urea degree more than 200 mg/dl because blood urea concentration is one of indicators that there was a pretense

of protein metabolism rest in body (Wein., Kavoussi., Novick., Partin., Peters, 2007., Sukandar, 2006).

The uremia causes happened is ESRD in renal blood vessel that blocked will defuse again on blood stream. The uremia causes on renal cover the disease that influence of glomerulus and renal micro vascular system or tubules renal (Damayanti, 2017). Uremia causes function disorder almost organ system such as, liquid function and electrolyte, endocrine metabolic, cardiovascular and lungs, skin, gastrointestinal, hematology and immunology, manifestation as like nausea, vomit, apathies, weakness, dry skin, and fatigue (Priscilla & LeMone, 2016).

4. Conclusion and Suggestion

There is the influence of HD adequacy toward blood urea degree on ESRD patients who implementing dialysis therapy. Consequently, it is hoped that hospital management to increase the HD adequacy on ESRD patients who implementing the dialysis therapy, with good HD adequacy it is hoped that blood urea degree will achieve the normal condition, so that clinical symptoms appears on patients will be better.

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