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The Different of Quality of Life Between Patient with Kidney Failure Undergoing Hemodialysis and Continous Ambulatory Peritoneal Dialysis (CAPD)

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ABSTRACT

Dialysis is a therapy that aims to remove waste and excess fluid from the body. This method replaces the main function of the kidney. Two types of dialysis are known, namely Peritoneal Dialysis and Hemodialysis. Patients with chronic kidney failure are faced with these two treatment options. Both types of dialysis therapy have a risk of complications during the treatment period that can affect the quality of life of patients. The purpose of this study was to determine the differences in dialysis methods of patients with chronic kidney failure with CAPD (continuous ambulatory peritoneal dialysis) and hemodialysis in terms of quality of life as a basis for palliative care. The research design uses a cross-sectional comparative analytical research design. The independent variable is the action of hemodialysis and CAPD. The dependent variable is quality of life. The study sample was patients with chronic kidney failure who underwent hemodialysis and CAPD at Saiful Anwar Hospital in Malang with 126 respondents using consecutive sampling technique. Data analysis using Independent T-test (α = 0.05). The research instrument was a WHO-QOL questionnaire. Respondents who received hemodialysis were 104 patients. The average quality of life of patients undergoing hemodialysis was 84.52 ± 11.37. Respondents who received CAPD were 22 patients. The average quality of life of patients undergoing CAPD is 80.23 ± 7.95. There are differences in quality of life in patients who get HD and CAPD (p value = 0,000). There were no differences in kidney function in patients who received HD and CAPD (creatinine p value = 0.130; urea p value = 0.083).

Keywords: Kidney failure, hemodialisys (HD), CAPD

INTRODUCTION

Dialysis is a therapy that aims to remove waste and excess fluid from the body. This method replaces the main function of the kidney. 2 types of dialysis are known, namely Peritoneal Dialysis, and Hemodialysis. Patients with chronic kidney failure are faced with these 2 treatment options. Both types of dialysis therapy have a risk of complications during the treatment period. In patients with chronic kidney failure with CAPD (Continuous Ambulatory Peritoneal Dialysis) has the risk of infection (one of them is peritonitis), if it does not do the principle of hygiene and if it is not carried out according to schedule and dosage then the deterioration of kidney function will worsen and have an impact on the heart's performance. While complications that often occur in patients who undergo

HD are hemodynamic disorders (Landry and Oliver, 2006). Blood pressure generally decreases with ultrafiltration (UF) or withdrawal of fluid when HD.

The number of patients who remain alive with dialysis therapy in the United States continues to increase from year to year. In this country the mortality of patients with dialysis is close to 18% per year. This death is caused by cardiovascular disease and infections. The survival rate in patients using hemodialysis compared with peritoneal dialysis is almost the same, but the complications of the use of both types of methods have not done so much research. The existence of this study is expected to provide an overview of the different dialysis methods between hemodialysis and CAPD to the quality of life in patients.

The purpose of this study was to determine the differences in dialysis methods of patients with chronic kidney failure with CAPD (continuous ambulatory peritoneal dialysis) and hemodialysis in terms of quality of life as a basis for palliative care

MATERIALS AND METHODS

The research design uses a cross-sectional comparative analytical research design. The independent variable is the action of hemodialysis and CAPD. The dependent variable is quality of life. The study sample was patients with chronic kidney failure who underwent hemodialysis and CAPD at Saiful Anwar Hospital in Malang with 126 respondents using consecutive sampling technique. Data analysis using Independent T-test ($\alpha = 0.05$). The research instrument was a WHO-QOL questionnaire. The study was conducted between August 13-16 2018.

RESULTS

Demographic data of respondents with HD shows the highest sex of respondents, was men with a number of 57 (54.81%) respondents, the level of education shows almost half, was the level of senior secondary at 39 (37.5%) respondents. Judging from the marital status shows that most of them are married or still have a partner that is equal to 94 (90.38%) respondents, while seen from their jobs almost half of the respondents do not work that is equal to 41 (39.42%) respondents. From the results it can also be known that the respondents undergo HD, which is almost half of the respondents are in the range of 1-3 years, 40 (38.46%) respondents, the majority of respondents are in the final stage or 5, as many as 63 (6058%) and almost half of respondents having hypertensive comorbidities, which amounted to 34 (32.69%) respondents.

While the demographic data of respondents with CAPD shows that the respondents' sexes are mostly men with a total of 14 (63.64%) respondents, the level of education shows mostly that is the level of senior secondary at 14 (63.64%) respondents. Judging from the marital status, most of them were married or still had partners, which amounted to 16 (72.73%) respondents, while seen from their jobs, half of the respondents did not work, which was 11 (50%) respondents. From the results it can also be known for the length of time the respondents underwent CAPD, that is, almost half of the respondents were in the range of 1-3 years and less than a year, namely 8 (36.36%) respondents, the majority of respondents were at the final stage or 5 namely 14 (63.64%) respondents and almost half of respondents did not have comorbidities which amounted to 9 (40.91%) respondents after that with hypertension of 7 (31.82) respondents.

The average value of creatinine the respondents who underwent HD was equal to (12.93 ± 4.53) mg / dL with a minimum value of (5.45-22.01) mg / dL. The average value of urea can be obtained at (144.89 ± 44.73) mg / dL with a min value (97.5-250.3) mg / dL, while the average value of Hb is obtained (8.61 ± 1.79) g / dL with min-value (6-12,6) g / dL.

While the average value of creatinine the respondents who underwent CAPD was equal to (10.32 ± 4.1) mg / dL with a minimum value of (4.39-18.83) mg / dL. The average urea value can be obtained at (104.18 ± 48.2) mg / dL with a minimum value (51.4-209.4) mg / dL, while the average value of Hb is obtained (9.98 ± 2.72) g / dL with min value (6.9-18.9) g / dL

The average value of the quality of life of respondents who underwent HD was (84.52 ± 11.37) with student grades (64-130), while the average quality of life of respondents who underwent CAPD was (80.23 ± 7, 95) with min value (67-98)

Table 1 Analysis of the independent T-test on the quality of life of HD and CAPD patients

Variable	*P Value*
Quality of Life	0,000

The results of the analysis showed that the P value of quality of life compared with the value of α (0.05) was found to be less than (α) which means accept H1, which means there is a difference in quality of life in patients who get HD and CAPD

Table 2 Analysis of independent T-test samples on differences in kidney function in HD patients and CAPD

Variable	*P value*
creatinine	0,130
Ureum	0,083

The results of the analysis showed the value of P value creatinine (0.130) and urea (0.083) above the value of α (0.05) which means accept H0 which means there is no difference in kidney function in patients who get HD and CAPD.

Identifying the Quality of Life of Patients with Chronic Kidney Failure with Continuous Ambulatory Peritoneal Dialysis (CAPD)

The results showed that the average quality of life of respondents who underwent CAPD was (80.23 ± 7.95) with a minimum-maximum value of 67-98. The results of quality of life in CAPD respondents concluded that there were 50% of respondents who had a good quality of life using the cut of point, the mean value.

CAPD is a dialysis technique using the peritoneal membrane as a dialysis membrane that separates the dialysate in the peritoneal cavity and blood plasma in the peritoneal blood vessels during the CAPD process, which aims to eliminate uremia, excess body fluids and control the electrolyte balance experienced by patients with Chronic Kidney Disease (CKD), this dialysis requires patients to be independent and active in carrying out their actions and treatments (Kallenbach, et all. 2005). The results of the study also state that respondents who use the most CAPD are in the range of less than one year and between 1-3 years, this is also possible as a factor that influences the quality of life of respondents using CAPD because of the need for himself.

Failure of kidney function will have an impact on the decrease in the amount of hemoglobin in the blood, this is due to decreased kidney function in producing erythropoitin. Physiologically, erythropoetin is a hormone synthesized by peritubular kidney cells, which functions to stimulate precursor cells in the bone marrow to develop into adult red blood cells (Black and Hawks, 2009). Damage to peritubular cells causes disruption of erythropoietin production, so that the erythropoesis process to form red blood cells decreases. This causes low hemoglobin levels and the emergence of anemia in patients with chronic kidney failure. The results also obtained an average value of Hb obtained (9.98 ± 2.72) g / dL with a minimum value (6.9-18.9) g / dL. The average results of the hemoglobin of the respondents also found a decrease in the normal value, this can lead to reduced energy for patients to move so that the productivity and quality of life of patients decreases.

When hemoglobin levels can be maintained more than 11 g / dL, the physiological responses of anemia such as vasodilation, increased venous return, enlarged heart and decreased cardiac output can be prevented (Snyder et al, 2004). This condition allows patients to maintain their physical health within the optimal limits, so that the quality of life can be maintained.

Identifying the quality of life of patients with Chronic Kidney Failure with Hemodialysis (HD)

The results showed that the average quality of life of respondents who underwent HD was (84.52 ± 11.37) with minimum grades (64-130). The results of the questionnaire also stated that 63 respondents had poor quality of life and the remaining 41 respondents had good quality of life based on the cut of point value of the mean.

Chronic kidney failure is a decrease in kidney function that cannot recover and progressively progresses. Kidneys that are still functioning but unable to maintain the body's internal environment, end-stage kidney failure will occur. The role of the kidney will be replaced by a dialysis machine called hemodialysis therapy. Hemodialysis cleanses the rest of metabolic products and excess electrolyte fluid from the blood through an artificial kidney called a dialiser. This therapy aims to maintain fluid and electrolyte balance such as potassium, sodium and chloride and maintain blood pressure within normal limits (Black and Hawks, 2009). This causes respondents to depend on lifelong HD therapy that can have a good impact on the physical and psychological conditions of the respondents that will affect the quality of life of the respondents.

In the study, almost half of respondents 40% underwent HD therapy in the span of 1-3 years, this is possible for respondents to adaptation to the condition is still not so good that it also affects the quality of life of patients. A similar study conducted by Anees, et al (2011) proved that patients who had undergone hemodialysis more than 8 months had a higher quality of life on the dimensions of physical health and social relationships than those who had undergone hemodialysis for less than 8 months.

In chronic kidney failure undergoing HD, there will be some unstable laboratory blood values that are also related to the patient's quality of life, namely hemoglobin levels. Decreased hemoglobin in CRF patients is caused by inadequate production of kidney erythropoietin (Foley, Curtis & Parfrey, 2009). The results showed that the average value of Hb in the responses undergoing HD was obtained (8.61 ± 1.79) g / dL with a min value (6-12.6) g / dL. This average value shows a value that is lower than the normal value. It is also possible to affect the quality of life of respondents because the decrease in hemoglobin causes the emergence of symptoms of anemia such as pale, weak body and easily tired. Research shows that anemia is associated with enlargement of the left ventricle of the heart which causes a decrease in heart contractions and a decrease in blood supply to body tissues. The decrease in blood supply to body tissues further aggravates the symptoms of anemia that are felt by patients (Druce et al., 2006).

Analyzing the differences in CAPD and Hemodialysis on the quality of life of patients during dialysis therapy

The results of the analysis showed that the P value of quality of life (0,000) compared with the value of α (0,05) was found to be less than (α) which means accept H1, which means there is a significant difference in quality of life in patients who get HD and CAPD. This difference is caused by several factors involved including the duration of dialysis therapy. In the study, respondents with CAPD tended to be earlier in undergoing therapy compared to respondents who underwent HD therapy.

Another difference found in respondents is the difference in hemoglobin levels that affect quality of life, this is because dialysis therapy only maintains kidney excretion function, while the non-excretory function of one of them is erythropoetin hormone production, cannot be replaced (Price and Wilson, 2002). Kidney failure patients undergoing dialysis therapy are still anemic (Lewis, 2011). Based on this mechanism, patients receiving dialysis therapy need erythropoietin therapy to maintain blood hemoglobin levels. On the results of the study found the average HB in CAPD respondents is higher than the average Hb on respondents with HD, this can be assumed that the physical condition of CAPD respondents is better than HD.

The results showed a greater number of male patients than women could be caused by several things, including enlarged prostate in men can cause obstruction and infection that can develop into kidney failure. In addition, the formation of kidney stones is more common in men because the urinary tract in men is longer so that the precipitation of more rock-forming substances than women. Men also have more habits that can affect health such as smoking, drinking coffee, alcohol, and

supplement drinks that can trigger systemic diseases that can cause a decrease in kidney function and have an impact on their quality of life (Black, J. M., & Hawks, J. H. (2009).

Analyzing the differences in CAPD and Hemodialysis on the physiology of the kidneys (urea and creatinine) of patients during dialysis therapy

The results of the analysis obtained P values of creatinine (0.130) and urea (0.083) above the value of α (0.05) which was significantly accepted by H0, which means there was no significant difference in kidney function in patients who received HD and CAPD. This is because the two treatments show that the levels of urea and creatinine are increasing and not so far apart. However, clinically the average value of urea and creatinine in CAPD respondents is lower than for respondents who undergo HD. The results showed that the average value of the respondents who underwent CAPD was equal to (10.32 ± 4.1) mg / dL, while the average value of urea could be obtained (104.18 ± 48.2) mg / dL when compared with HD respondents the results showed creature mean values (12.93 ± 4.53) mg / dL, while the mean urea values were obtained (144.89 ± 44.73) mg / dL. The results of this study can be concluded that CAPD action can prevent the increase in urea and creatinine levels better than HD.

Ureum is the largest nitrogen product that is excreted through the kidneys. Ureum comes from the metabolism of food proteins and endogenous proteins in the body. The kidneys function to maintain urea levels within normal limits in the blood. In healthy kidney conditions, the urea will be released from the body continuously through the process of filtration and excretion. This process will help maintain the balance of urea levels in the blood. The balance of urea levels is very necessary to maintain physical conditions in patients with kidney failure. Patients with chronic kidney failure often experience elevated blood urea levels. This increase is caused by impaired kidney function in filtering and removing urea from the blood. Increased urea will cause various symptoms in the multisystem body called uremic syndrome. A collection of symptoms due to an increase in urea will worsen the physical condition of patients with kidney failure, thus reducing the quality of life of patients (Yamana, 2009). The level of urea, blood creatinine level is also one of the important indicators for determining kidney excretion function (Black & Hawk, 2009) and affects the quality of life of patients with CRF who undergo hemodialysis therapy (Yamana, 2009).

While Creatinine is the result of muscle cell metabolism which is excreted into the blood after doing activities. Creatinine comes from food and biosynthesis of various organs, especially the liver. A diet source absorbed through the intestine will be synthesized into creatine by the liver. Creatinine is then used for muscle cell metabolism. Muscle cell metabolism constantly converts creatine to creatinine which diffuses out of muscle cells. Creatinine in the blood will be excreted by the kidneys through urine. Increased creatinine levels in the blood occur when the kidney excretion function has decreased. This is because most creatinine is removed through the kidneys and there is no reabsorption process in the kidneys to restore creatinine. Therefore creatinine is a blood chemical that is important for determining the glomerular filtration rate as an indicator of kidney excretion function (Wyss, 2000).

Excess urea levels cause conditions of acidity in the blood to increase which causes a disruption of the acid base balance in the body. Patients often experience metabolic acidosis under severe uremia. Metabolic acidosis causes various symptoms such as rapid and shallow breathing even to a decrease in consciousness. In addition, increased levels of urea in the blood also cause systemic symptoms in various body systems. Uremia causes multi-system disorders including gastrointestinal, respiratory, nerve, and so on. In the digestive system, uremia causes an increase in stomach acid production, resulting in symptoms of nausea, vomiting and anorexia. In the respiratory system, uremia causes complaints of shortness of breath, shallow and fast breathing. This is as part of the body's compensation for maintaining normal pH in the blood by increasing CO2 excretion through the lungs.

DISCUSSION

Patients who are able to maintain urea levels within normal limits will show better physical health and general health perceptions than patients who fail to maintain normal urea levels. Urea levels can be maintained within normal limits by running a low-protein diet and routine hemodialis

therapy. The duration and frequency of hemodialysis adjusted to the excretion needs of patients will maintain urea levels within normal limits. The diffusion and ultrafiltration processes that occur in the dialiser are able to transfer excess urea from the blood into the dialysate solution, so that after undergoing dialysis the patient's urea level can be lowered. The condition of kidney failure patients who require using lifelong dialysis therapy requires the respondent to comply with all lifestyles that are in accordance with the conditions of kidney failure so that the quality of life increases.

CONCLUSION

There are differences in quality of life in patients with kidney failure who get HD and CAPD therapy and there is no difference in kidney function in patients who get HD and CAPD statistically but clinically different, namely urea and creatinine in CAPD respondents lower than HD respondents.

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REFERENCE

Aness, M. (2011). Dialysis-related factors affecting quality of life in patients on hemodialysis. Iranian Journal of Kidney Diseases, 5, 9-14.

Black, J., M., & Hawks, J., H. (2009). Medical surgical nursing: Clinical management for positive outcomes (8th ed) Elsevier. Inc.

Druce, T., B., et al. (2006). Normalization of hemoglobin level in patients with chronic kidney disease and anemia. N Engl J Med. 355, 2071-84.

Foley, R., N., Curtis, B., M., & Parfrey, P., S. (2009). Erythropoietin therapy, hemoglobin targets, and quality of life in healthy hemodialysis patients: A randomized trial. Clin J Am Soc Nephrol, 4, 726-733.

Kallenbach, J., Z., Gutch, C., F., Martha, S., H., & Corca, A., L. (2005). Review of hemodialysis for nurse and dialysis personel (7 th ed.). St. Louis : Elsevier Mosby.

Lewis, S., L., et al. (2011). Medical surgical nursing: Assessment and management of clinical problems (8th ed). Elsevier. Inc.

Price, S., A., & Wilson, L., M. (1995). Patofisiologi konsep klinis proses-proses penyakit. Jakarta: EGC.

Snyder, J., J., (2004). Hemoglobin levels and erythropoietin doses in hemodialysis and peritoneal dialysis patients in the United States. J Am Soc Nephrol. 15, 174–179.

Wyss, M., & Daouk, R., K. (2000). Creatine and creatinine metabolism, physiological Reviews. Vol. 80, No. 3, July 2000. http://physrev.physiology.org/content/80/3/1107.full.pdf.

Yamana, E. (2009). The relationship of clinical laboratory parameters and patient attributes to the quality of life of patients on hemodialysis. Japan Journal of Nursing Science, 6, 9–20.