

Description of Comorbid Diseases in Outpatients on Hemodialysis at Hospital X, Kediri Region 2024

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ABSTRACT

Chronic kidney disease is a progressive condition that affects more than 10% of the general population worldwide or more than 800 million people (National Kidney Foundation, 2021). of this study was to determine the description of comorbidities in hemodialysis outpatients at Hospital X in the Kediri area. This research method uses a quantitative non-experimental analytical descriptive design. Sampling was conducted using the Purposive Sampling technique and obtained a sample of 52 hemodialysis patients at Hospital X. The conclusion of this study is expected to provide a picture of comorbidities in hemodialysis outpatients, so that comprehensive nursing care can be carried out to minimize complications and improve the quality of life of hemodialysis outpatients

INTRODUCTION

Chronic kidney disease is a global public health problem with increasing prevalence and incidence of chronic kidney failure, poor prognosis and high costs (Kemenkes RI, 2019). Chronic kidney disease is a progressive condition that affects more than 10% of the general population worldwide or more than 800 million people (National Kidney Foundation, 2021). The results of the 2018 Basic Health Research (Riskesdas, 2018) showed that the prevalence of chronic kidney disease in the population over 15 years of age in Indonesia in 2013-2018 was 3.8% and in Central Java Province it was 4%, higher than the national prevalence rate (Kemenkes RI, 2018). The kidneys can fail at a certain stage r

equiring hemodialysis therapy to help remove uremic toxins and fluids and regulate fluid, electrolyte and acid-base balance (Tjokroprawira et al., 2015). The Indonesian Renal Registry (IRR) reported that the number of chronic kidney failure patients undergoing hemodialysis in 2018 was 36,975 people (Indonesia Renal Registry, 2018).

Chronic kidney failure occurs due to a decrease in the kidney's ability to maintain balance in the body. Kidney damage occurs in the nephrons including the glomerulus and renal tubules, damaged nephrons cannot return to normal function. Decreased kidney function disrupts the balance of fluids in the body, resulting in the accumulation of metabolic waste, especially urea (causing uremia), fluid balance disorders, accumulation of fluids and electrolytes in the body (Siregar, 2020). Research on excess fluid in chronic kidney failure patients shows that the most weight changes (IDWG or Interdialytic Weight Gain) in chronic kidney failure patients undergoing hemodialysis are > 3.5% as many as 37 respondents (37.7%) (Kurnia E, 2021). These results exceed good weight gain, which is around 2.5% -3.5%. Melianna's research (2019) stated that of 84 chronic kidney failure patients, 45 people (54%) had excess fluid or overload (Melianna & Wiarsih, 2019).

Comorbidity is referred to as the occurrence of other conditions/diseases besides ESRD or CKD, where these conditions affect other organs, but can also cause kidney failure and have a negative impact on the survival of hemodialysis patients. Comorbid conditions associated with CKD mortality undergoing hemodialysis are age, coronary heart disease, congestive heart failure, stroke, sepsis, tuberculosis and pneumonia (Artiany & Gamayana Trimawang Aji, 2021).

According to the study "Risk Factors Chronic Renal Failure on Hemodialysis Unit in RSUD Wates Kulon Progo", it also states that gender, age, history of diabetes mellitus disease, history of hypertension risk factors, history of use of analgesic drugs, NSAIDs, history of smoking and history of use of energy supplement drinks are related to the occurrence of CKD (Pranandari & Supadmi, 2015). Mardana, (2015) explains that the management of patients with chronic kidney disease includes therapy for the underlying disease, namely by preventing therapy for comorbid conditions, slowing down the deterioration (progression) of kidney function.

Patients undergoing hemodialysis have a high prevalence of comorbidities, including Atherosclerosis Cardiovascular Disease (ACVD), Congestive Heart

Failure (CHF), hypertension, diabetes mellitus (DM), and cognitive disorders, where these comorbidities are one of the risk factors for death (Kan, CW et al., 2013). In a study conducted by Pakpour et al., (2010) it was found that 66% of 250 hemodialysis patients had comorbidities. The presence of various comorbidities will increase the symptoms experienced by patients, and will have an impact on hospital visits, Length of Stay (LOS), treatment costs, and death (Beddhu et al., 2000). From the description above, it is known that comorbidities have a negative impact on the lives of hemodialysis patients. However, in reality, comorbidities in hemodialysis patients have not been given much attention. Therefore, researchers want to know the description of comorbidities in homodialysis patients.

The introduction is a little different from the short and concise abstract. The reader needs to know the background to your research and, most importantly, why your research is important in this context. The purpose of the Introduction is to stimulate the reader's interest and to provide pertinent background information necessary to understand the rest of the paper.

LITERATUR REVIEW

1. Hemodialysis

1.1 Definition of Hemodialysis.

Hemodialysis is one of the kidney replacement therapy methods due to kidney failure. When the kidneys are impaired, the filtration, absorption-secretion, and excretion functions will be disrupted, resulting in the accumulation of toxic metabolites in the body that are usually excreted through the kidneys (called uremic toxins). The kidneys can experience acute or chronic dysfunction, which at a certain stage will require dialysis to help remove uremic toxins (Tjokroprawira et al., 2015).

According to the K/DOQI recommendations, dialysis is considered when GFR or CRC is 0.15 mL/minute per 1.73 m² (Stage 5). Several things other than GFR that need to be considered when deciding on dialysis are as follows: (1) nutritional status: persistent anorexia, nausea and vomiting, weight loss (patients who are not edematous), fatigue, decreased serum albumin levels. (2) Electrolyte, acid-base and fluid status: repeated disturbances in electrolyte/acid-base balance, tendency to experience excess fluid, shortness of breath, etc. (3) Conditions of other organs and metabolites: uncontrolled hypertension, congestive heart failure, pericarditis, nerve deficits, pruritus, etc. (Tjokroprawira et al., 2015).

The dialysis process prescription is carried out by a nephrologist (internal disease specialist, kidney consultant) to determine various parameters of the dialysis process such as frequency (how many treatments per week), duration of HD, and blood flow rate and dialysate fluid, as well as the type of dialyzer membrane and dialysate concentrate used (Tjokroprawira et al., 2015).

1.2. Hemodialysis Components

1.2.1. Semipermeable membrane or dialyzer.

The dialyzer is part of the equipment for filtering blood. It is shaped like a tube consisting of 2 compartments (rooms), namely the blood

compartment and the dialysate compartment. Each dialysate has an inlet and outlet. There are various types of membrane dialyzers, the difference between each dialyzer is determined by the pore size (flux), membrane material, surface area, membrane efficiency. (Tjokroprawira et al., 2015).

1.2.2. Dialyzer reuse or reprocessing

is reuse after going through procedures starting from cleaning, assessing damage and measuring membrane performance and the disinfection process. Reuse of the dialyzer should not be used for other patients but can only be used by the same patient. Some countries still use this method to reduce the cost of HD procedures (Tjokroprawira et al., 2015).

1.2.3. Concentrate Dialysate.

Consists of 2 parts, namely acidic fluid and basic fluid/powder. Each part has a different electrolyte composition. There are various types of dialysate concentrates with different electrolyte compositions such as calcium levels, potassium levels, glucose levels, magnesium levels, etc. The selection of dialysis concentrate depends on the patient's needs. (Tjokroprawira et al., 2015).

1.2.4. Blood hose.

Consists of several parts: (1) the hose area on the blood flow pump, (2) the anti-coagulant hose, (3) the bubble trap for protection against air embolism, (4) the pressure monitor hose, (5) the port for drugs (Tjokroprawira et al., 2015).

2.2.5. Anticoagulant.

There are various choices such as heparin, LMWH, citrate (Tjokroprawira et al., 2015).

2.2.6. Vascular access.

(1) Central venous catheter (CVC): generally temporary, often used in patients who require hemodialysis in cases of acute or chronic kidney disorders before having permanent access, (2) AV fistula: generally permanent, used in patients with chronic kidney disease. Radiocephalic fistula by connecting arteries and veins through anastomosis. The advantages of using AV fistula are lower infection rates, as no foreign material is involved in their formation, higher blood flow rates and lower incidence of thrombosis, (3) Artery graft: A graft implanted under the skin to connect an artery and vein, usually made of synthetic material, and must be replaced if the graft is damaged. Used in patients with chronic kidney disease (Tjokroprawira et al., 2015).

2. Comorbidities

Chronic kidney disease (CKD) is often accompanied by other pathological conditions that occur simultaneously (comorbid conditions). Several studies have shown that the comorbid conditions of CKD patients are related to the level of CKD patients undergoing hemodialysis. Based on research by Ismatullah (2015), one of the comorbidities in CKD patients undergoing hemodialysis is anemia. Anemia in CKD most often occurs due to erythropoietin (EPO) deficiency, but there are other factors that cause anemia,

the most common of which is iron and folate deficiency. Anemia that occurs in CKD can reduce the patient's quality of life.

Impaired kidney function has an impact on changes/balances in several important minerals in the body. One of the important minerals is calcium. Calcium is the most abundant mineral needed at the biological stage. Calcium plays a role in regulating blood pressure, namely reducing the activity of the renin-angiotensin mechanism, sodium and potassium balance, and preventing blood vessel constriction (Izzah et al., 2021).

RESEARCH METHODOLOGY

This study is a non-experimental type of quantitative research with a descriptive analytical approach. The research design is cross-sectional. The population of this study were all outpatients undergoing hemodialysis at Hemodialysis Hospital X in the Kediri area. The inclusion criteria for this study were age over 40 years; outpatients who underwent hemodialysis routinely in the last 3 months; hemodialysis patients with chronic kidney disease who underwent hemodialysis and also suffered from comorbidities; patients willing to be respondents. The exclusion criteria consisted of patients with mental disorders; patients with decreased consciousness; hearing impairment. Sampling used the consecutive sampling method and 52 patients were obtained as research samples. This study was conducted in January-March 2024. The study was conducted at Hospital X in the Kediri area.

RESULT AND DISCUSSION

Table 1. Respondent Characteristics Based on Gender, Age and Length of Hemodialysis

Patient characteristics	Amount	Percent (%)
Gender		
Man	23	44.23
Woman	29	55.77
Age		
45-54 years	17	32.69
55-64 years	26	50
65-74 years	9	17.31
Long Time Running HD		
<1 year	8	15.38
1-5 years	29	55.77

Patient characteristics	Amount	Percent (%)
6-10 years	13	25
>10 years	2	3.85

Based on table 1, the majority of male respondents were 23 patients (44.23%) and female respondents were 29 respondents (55.77%). Based on age level, the majority of patients were in the 56-64 years age group, 26 respondents (50%), followed by the 45-54 years age group, 17 respondents (32.69%), and the least age group >65 years, 9 respondents (17.31%).

Based on the length of time patients underwent hemodialysis, the data obtained showed that the most time undergoing hemodialysis was in the time span of 1-5 years as many as 29 respondents, followed by a time span of less than 6-10 years as many as 13 respondents, a time span of <1 year as many as 8 respondents and the least in the time span of >10 years as many as 2 respondents.

Table 2. Respondent Characteristics Based on Type, Number and Duration of Comorbidities

Comorbid	Amount	Presentation (%)
Hypertension	19	36.54
Diabetes Mellitus	8	15.38
Anemia	3	5.77
Infection Urinary Tract Infection (UTI)	10	19.23
Coronary heart disease (CHD)	6	11.54
Malnutrition	6	11.54
Amount Comorbid		
1 comorbid	34	65.38
>1 comorbid	18	34.62

Based on table 2, the highest comorbid type data was obtained, namely Hypertension as many as 19 respondents (36.54%), followed by Urinary Tract Infection (UTI) as many as 10 respondents (19.23%), Diabetes Mellitus as many as 8 respondents (15.38%), Coronary heart disease (CHD) and malnutrition as

many as 6 respondents (11.54%), and the lowest comorbidity was Anemia as many as 3 respondents (1.92%). Likewise with the results of a study conducted by Rohenti, et al (2019) the most common type of comorbidity in chronic kidney patients undergoing hemodialysis at RS X in the Bekasi area was anemia. Other comorbidities in the results of this study were urinary tract infection (UTI), gout due to impaired kidney function, kidney failure, bone metabolism disorders, etc.

Based on the number of comorbidities, data showed that the majority of respondents had one comorbidity, as many as 34 respondents (65.38%) and those who had more than one comorbidity were 18 respondents (34.62%).

DISCUSSION

Gender is one of the variables that can provide differences in incidence rates in men and women. This is in line with research by Saputra et al., (2020) and the results of the 2018 Riskesdas that most CKD patients undergoing hemodialysis are male. Likewise with the results of research by Kristina et al., (2021) that the number of men undergoing hemodialysis is greater than women and reaches 57.14%. The large percentage shows that more men experience decreased kidney function. This large incidence rate can be caused by the habit of smoking which is one of the factors that can worsen kidney function. Another factor that shows that the decrease in glomerular filtration rate is slower in women than in men is due to hormonal differences (Fauziah et al., 2015). This is in line with research Rohenti et al., (2019) that male patients are more likely to suffer from chronic kidney disease undergoing hemodialysis, namely 59.46%.

Age is a risk factor for CKD. The older a person is, the lower their kidney function. Normally, this decrease in kidney function occurs at the age of over 40 years (Sidharta et al., 2016). Clinically, patients aged >60 years have a 2.2 times greater risk of experiencing chronic kidney disease compared to patients aged <60 years. This is a normal process for every individual as they age, where there will be a decrease in kidney function that occurs very quickly and progressively so that it can cause complaints from mild to severe to the point of chronic kidney disease (Pranandari & Supadmi, 2015).

The results of the study related to the duration of hemodialysis are supported by research (Insani & Putu Ristyaning Ayu, 2019), not much different based on the duration of hemodialysis divided into two groups, namely <2 years as many as 60 patients (65.2%) and >2 years as many as 32 patients (34.8%). The results are not much different from the study (Josen, 2020) the majority of respondents who have undergone hemodialysis are more than 12 months (66.1%), for 6-12 months (24.22%), and <6 months (9.7%). Where patients undergo hemodialysis for a longer time, the lower the level of depression felt by the patient, which is likely due to the success of the patient's adaptation to their condition. Comorbidity is defined as the occurrence of other conditions/diseases besides ESRD/chronic kidney disease that affect other organs, so that comorbidity can have a negative impact and affect the survival of patients undergoing hemodialysis.

Hypertension is the highest type of comorbidity in the research results. Supported by research at the Hemodialysis Unit of RS X in the Kediri area, the

first highest comorbidity is hypertension with 19 patients. In line with research (Artiany & Gamayana Trimawang Aji, 2021), kidney failure patients undergoing hemodialysis at RSAU dr. Esnawan Antariksa mostly have hypertension comorbidity with a percentage (54.61%). Hypertension is closely related to kidney health, where hypertension is the main trigger for kidney disease and failure. And vice versa, when kidney function is impaired, blood pressure will increase and cause hypertension. Hypertension can worsen kidney damage by increasing intraglomerular pressure which triggers structural and functional disorders in the glomerulus. High intravascular pressure is channeled through the afferent artery into the glomerulus, where the afferent artery constricts due to hypertension. Hypertension then causes the heart to work harder and damages the renal blood vessels, resulting in filtration disorders and increasing the severity of hypertension.

Urinary tract infection is the second highest comorbidity. The prevalence of chronic kidney failure at RSUP dr. Mohammad Hoesin Palembang with trigger disease / history of UTI is 26 cases (14.2%) (Hervinda, 2014). Urinary tract infection is also one of the causes of CKD. The occurrence of urinary tract infection accompanied by vesicoureteral reflux will increase the formation of scars in the kidneys which will cause decreased kidney function. A person with a history of urinary tract infection is 5 times more at risk of developing CKD than someone without a history of urinary tract infection. The prevalence of UTI is higher in women than in men because the anatomy of the female urethra has a short urethra of 2-3 cm, in addition, because the location of the female urinary tract is closer to the rectum, making it easier for germs to enter the urinary tract.

Diabetes Mellitus is the third highest comorbidity. DM affects various organs of the body, impaired vision, heart disease, kidney damage, cerebrovascular disease and peripheral vascular disease, to amputation and physical health disorders. This causes limitations in carrying out daily activities and the ability to work (El-Shaded et al., 2013). In addition, insulin or oral antidiabetic drugs, continuous blood sugar monitoring, and dietary restrictions affect the patient's quality of life.

Coronary Heart Disease is the fourth highest comorbidity along with malnutrition. According to the study "The Relationship Between Comorbid Conditions and Mortality in Chronic Kidney Failure Patients Undergoing Hemodialysis at Dr. Soedarso Hospital Pontianak", there is a relationship between comorbid coronary heart disease and mortality in chronic kidney disease patients undergoing hemodialysis, which is 28 patients. It is interpreted that chronic kidney disease patients who have comorbid coronary heart disease have a 24.55 times higher risk of death compared to chronic kidney disease patients who do not have comorbid coronary heart disease (Lida, 2015). For comorbid diseases, malnutrition is comparable to the study of Jaber et al., (2024), Globally, studies have used various tools or classifications to measure the risk of malnutrition but consistently show that the prevalence of malnutrition exceeds 50% in most cases. Malnutrition in patients undergoing hemodialysis can be associated with iatrogenic factors, such as nutritional loss and

inflammation due to dialysis and/or noniatrogenic factors, such as loss of appetite, changes in taste, and insulin resistance. Furthermore, common comorbid conditions, such as heart failure, can contribute to worsening malnutrition in patients undergoing hemodialysis. Given the impact of malnutrition on mortality, psychological conditions, and cognitive function, optimizing the nutritional status of patients undergoing hemodialysis is key to improving health outcomes. Therefore, nutritional assessment and management, preferably by a dietitian, should be an integral part of hemodialysis care.

Anemia is a comorbidity with the lowest frequency in the research results. Anemia is caused by EPO (erythropoietin) deficiency. Erythropoietin is a hormone that plays an important role in the maturation and production of red blood cells. Because the kidneys are inadequate in producing erythropoietin, anemia occurs and affects the glomerular filtration rate $<50\text{ml/minute}$ or serum creatinine levels $> 2\text{mg/dL}$. In patients with kidney failure, anemia can also be caused by several things such as iron or vitamin deficiency (folate, vitamin B-12), hyperparathyroidism, hypothyroidism, and decreased erythrocyte survival (Widiana, 2013; Artiany & Gamayana Trimawang Aji, 2021)).

Amount comorbid as much as One is results research. This is compared to backwards with research on comorbidities patient hemodialysis at the Indonesian Air Force Hospital (RSAU) dr. Esnawan Antariksa, namely most have > 1 comorbidity as many as 82 patients (78.09 %) and the fewest with have 1 comorbid as many as 23 patients (21.91%) (Artiany & Gamayana Trimawang Aji, 2021).

CONCLUSION

Research result show majority type sex male (55.77%), age highest that is range age 55-64 years (50%), for the length of time undergoing hemodialysis highest namely 1-5 years (55.77%), type comorbid highest that is hypertension and the majority amount comorbid as much as One disease. Research conclusion This expected give description comorbidities in patients hemodialysis, so that can done care comprehensive nursing care For minimize complications and increase quality life patient hemodialysis.

RECOMENDATIONS FOR FURTHER STUDY

1. It is expected that other researchers can continue research in other hospitals to find out the comorbid picture of hemodialysis patients. so that we get a broader picture of hemodialysis patient comorbidity.
2. It is expected to be able to conduct further research related to hemodialysis patients such as: medical costs related to comorbidity. and can relate the influence of comorbidity to hemodialysis disease.

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