Indonesian Journal of Global Health Research
Volume 5 Number 4, November 2023
e-ISSN 2715-1972; p-ISSN 2714-9749
http://jurnal.globalhealthsciencegroup.com/index.php/IJGHR

ANALYSIS OF FACTORS RELATED TO THE INCIDENT OF CHRONIC KIDNEY FAILURE IN HYPERTENSION PATIENTS

Maria Agustina Making[1]*, Yulianti Kristiani Banhae[1], Febtian C Nugroho[1], Antonia Hamu[1], Israfil[2]
[1]Poltekkes Kemenkes Kupang, Jl. Piet A. Tallo, Liliba, Oebobo, Kupang, Nusa Tenggara Timur 85361, Indonesia
[2]Institut Teknologi dan Kesehatan Bali (ITEKES Bali), Jl. Tukad Balian No.180, Renon, South Denpasar, Denpasar, Bali 80227, Indonesia
*maria.agustinamaking02@gmail.com

ABSTRACT
Chronic kidney failure is a global health problem with increasing incidence, prevalence and mortality rates. Hypertension is one of the causes of kidney failure. So far there is no known research conducted regarding factors related to the prevalence of kidney failure. The aim of this study was to analyze various factors related to the incidence of chronic kidney disease in hypertensive sufferers. This research method is descriptive analytical with a cross sectional approach, this research was conducted in the inpatient room of Prof Dr WZ Johannes Hospital in April-August 2023. The sample size was 100 respondents using consecutive sampling technique. Statistical tests are univariate, bivariate and multivariate. The result is that the relationship between age and kidney failure shows a p value = 0.129 > 0.05. relationship with gender p value = 0.687 > 0.05, relationship with blood pressure p value = 0.356 > 0.050, cholesterol level with p value = 0.374 < 0.05, relationship with LDL levels p value = 0.783 > 0.05, The relationship with HDL levels is p value = 0.096 > 0. Meanwhile, the education factor has a relationship with kidney failure with a p value = 0.002 < 0.05 and the treatment history factor has a relationship with p value = 0.356 > 0.050. The conclusion is that educational factors and treatment history are the dominant factors in controlling blood pressure, thus preventing the occurrence of complications of chronic kidney failure in hypertensive patients.

Keywords: blood pressure ; chronic kidney failure; hypertensive patients

First Received	Revised	Accepted
18 August 2023	29 August 2023	24 September 2023
Final Proof Received		**Published**
20 October 2023		18 November 2023

How to cite (in APA style)
Making, M. A., Banhae, Y. K., Nugroho, F. C., Hamu, A., & Israfil, I. (2023). Analysis of Factors Related to the Incident of Chronic Kidney Failure in Hypertension Patients. *Indonesian Journal of Global Health Research*, *5*(4), 749-762. https://doi.org/10.37287/ijghr.v5i4.2412.

INTRODUCTION

The World Health Organization (WHO) states that chronic kidney disease is one of the non-communicable diseases with the largest contribution and death rate of 850,000 people per year. Data from the 7th Annual Report of the Indonesian Renal Registry shows that the death data for hemodialysis patients in 2014 in Indonesia was 2,221 people with cardiovascular disease as the highest cause of death (59%). The prevalence of chronic kidney failure cases in Indonesia according to basic health research in 2018 was 0.38%, while the prevalence of cases in East Nusa Tenggara was 0.33%. This shows that the prevalence of chronic kidney failure cases in East Nusa Tenggara is still quite high(Ministry of Health, 2018). Several risk factors that influence the occurrence of chronic kidney failure include diabetic nephropathy (52%), hypertension (24%), congenital abnormalities (6%), gout (1%), lupus (1%) and others.(Vallianou et al., 2019). Thus, it shows that the incidence of hypertension in NTT is close to the national average(Ministry of Health, 2018).

The high and increasing prevalence of subjects with CKD stages 1 to 3a and mild to moderate declines in estimated GFR (e.g. above 45 mL/min/1.73 m2), are due in part to the aging population but also to the increasing prevalence of hypertension(Hannan et al., 2021). The risk of cardiovascular risk increases further as kidney function decreases. Therefore, patients with advanced CKD are at greater risk of dying from cardiovascular events than progression to end-stage renal disease (ESKD)(Teo et al., 2021). Data from the World Health Organization (WHO) in 2015 shows that around 1.13 billion people in the world have hypertension, meaning that 1 in 3 people in the world are diagnosed with hypertension.(Hofmeyer & Taylor, 2021). There are factors that can trigger the occurrence of chronic kidney failure in hypertensive patients, some of which are age, gender, education level, marital status, employment status, economic status, history of diabetes mellitus, history of kidney stones, obesity status, cholesterol levels. total, LDL levels, HDL levels, and triglyceride levels(Chen et al., 2019). Based on the facts described above, this study aims to analyze various factors related to the incidence of chronic kidney disease in hypertension sufferers at Prof Dr WZ Johannes Hospital, Kupang City.

METHOD

Research design:This research is a non-experimental study with a cross-sectional design to determine the risk of complications of kidney failure in hypertensive patients at Prof Dr WZ Johannes Regional Hospital, Kupang City. Population, Sample and Sampling: The population in this study was 292 people. The sample size was 100 people who met the following inclusion criteria: Suffering from hypertension, able to read and write and willing to be research respondents by signing informed consent. The sampling technique is carried out in this way co-secutive sampling.Research Instruments:The instrument used was a questionnaire regarding risk factors for complications of kidney failure in hypertensive patients. Research Location and Time: The research was carried out in the inpatient room at Prof Dr WZ Johannes Regional Hospital, Kupang City.

RESULTS

Characteristics of Research Subjects

Table 1.
Age Characteristics of Respondents

Respondent's Age	f	%
< 50 Years	26	26.0
≥ 50 Years	33	33.0
≥ 60 Years	41	41.0
Gender		
Man	61	61.0
Woman	39	39.0
Education		
No school	4	4
Elementary school graduate	11	11
Graduated from junior high school/junior high school	13	13
High school/high school graduate	52	52
PT/Academic graduates etc	20	20
Marital status		
Marry	76	76.0
Single	11	11.0
Widow widower	13	13.0
Work	Frequency	Percent
Doesn't work	10	10.0
IRT	34	34.0
Civil servants	19	19.0

Entrepreneur/Private	16	16.0
Retired	14	14.0
Farmer	4	4.0
Etc.	3	3.0

Table 1 above is a distribution table of the number of respondents based on age who are research subjects. The data above shows that the majority of respondents were respondents aged ≥ 60 years, namely 41 respondents (41.0%). The number of respondents is based on gender, where the data above shows that the majority of respondents were male, namely 61 respondents. Characteristics of respondents based on educational background of respondents in this study were dominated by respondents with high school/high school graduates, namely 52 respondents. Most of the respondents were married, with the number of married respondents being 76 respondents. Respondents who work as housewives are the respondents with the most research subjects, namely 34 respondents.

Table 2.
The characteristics of respondents based on the respondent's blood pressure

Blood pressure	f	%
< 110/70 mmHg	4	4.0
110/70 – 130/90 mmHg	29	29.0
> 140/90 mmHg	67	67.0

Table 2.
The characteristics of respondents based on the respondent's blood

Characteristics	Good Category	Border Category	Danger Category	Total
Total cholesterol	55	34	11	100
LDL	14	40	46	100
HDL	61	13	26	100
Triglycerides	39	43	18	100
Temporary Blood Glucose	f		%	
Normal	64		64.0	
Abnormal	36		36.0	
Medical Diagnosis				
Hypertension	21		21.0	
GGK	19		19.0	
GGA	2		2.0	
Hypertension and Kidney Failure	58		58.0	
Complications				
HIV	1		1.0	
Cardiomegaly	1		1.0	
Coronary heart disease	1		1.0	
Uremium + SNH Syndrome	1		1.0	
Hyponatrium	1		1.0	
Gout	2		2.0	
Uric Acid + Cholesterol	1		1.0	
Stomach	5		5.0	
Heart + Stomach	1		1.0	
Susp. Pericardial effusion + CHF	1		1.0	
Mild Pleural Effusion	1		1.0	
Hyponatrium + Hyperkalemia + Hyperchloride	1		1.0	
Polyarthralgia	1		1.0	

Syphilis	1	1.0
Hemiplegia + SNH + Hypokalemia	1	1.0
Anemia + Hypokalemia	1	1.0
Hepatitis B	1	1.0
NSTEMI	1	1.0
Uric Acid + Shrinking Kidneys	1	1.0
There isn't any	76	76.0

History of Diabetes Mellitus	History of Kidney Stone Disease	History of Kidney Failure	History of Hypertension	Total
28	18	79	90	126
72	82	21	10	174
100	100	100	100	400

The table above explains the characteristics of respondents based on the respondent's blood pressure. Thus, it can be concluded that the majority of respondents had blood pressure > 140/90 mmHg, namely 67 respondents and the lowest were respondents who had blood pressure < 110/70 mmHg. The table above shows that respondents' total cholesterol is highest inin the good category, namely 55 respondents and the lowest in the danger category, namely 11 respondents. The highest LDL of respondents was in the danger category, namely 46 respondents and the lowest was in the good category, namely 14 respondents. HDL in the good category had the most respondents, namely 61 respondents, and the lowest was in the border category, namely 13 respondents. Meanwhile, respondents with borderline triglycerides were the most research subjects, with 43 respondents having borderline triglycerides and the lowest in the danger category, namely 18 respondents The table above shows that the majority of respondents had normal blood sugar, namely <200, 64 respondents and 34 respondents who had abnormal blood sugar. Abnormal blood sugar is blood sugar > 200.

The table above shows the characteristics of respondents based on medical diagnosis, where the majority of respondents were diagnosed with hypertension and kidney failure, where the number of respondents was 58 respondents. Meanwhile, the lowest number of respondents were respondents who suffered from acute kidney failure, namely 2 respondents. The table above explains the characteristics of respondents based on treatment history where the majority of respondents are compliant in taking medication. The number of respondents who adhered to taking medication was 64 respondents, while the lowest number of respondents who did not take medication was 11 respondents. The table above shows that the majority of respondents complied with the control, namely 69 respondents. Meanwhile, the lowest were patients who were sometimes controls, namely 15 respondents.

The table above shows that the majority of respondents did not have complications. The number of respondents who did not have complications was 76 respondents. There were 24 respondents who had complications. Above is the number of respondents who had complications, where the most respondents who had complications were gastric diseases, namely 5 respondents. The table above shows that 72 respondents did not have a history of diabetes mellitus and 28 respondents had a history of diabetes mellitus. 82 respondents had no history of kidney stones and 18 respondents had this history. There were 79 respondents who had a history of kidney failure and 21 other respondents had no history of kidney failure. Meanwhile, there were 90 respondents who had a history of hypertension and 10 other respondents did not have a history of hypertension.

Table 4.
Analysis of the Relationship between Age and the Incidence of Kidney Failure in Hypertension Patients

Respondent's Age	Kidney Failure		P value	r
	Yes	No		
< 50 Years	22	4		
≥ 50 Years	28	5	0.129	0.153
≥ 60 Years	29	12		
Gender				
Man	49	12		
Woman	30	9	0.687	0.041
Education				
No school	2	2		
Elementary school graduate	6	5		
Graduated from junior high school/junior high school	9	4	0.002	-0.311
High school/high school graduate	43	9		
PT/Academic graduates etc	19	1		
Blood pressure				
< 110/70 mmHg	3	1		
110/70 – 130/90 mmHg	25	4	0.356	0.093
> 140/90 mmHg	51	16		
Treatment History				
Yes: Obedient	58	6		
Yes: Sometimes/Often Forgot	19	6	0,000	0.452
Do not consume drugs	2	9		
Control History				
Obedient	66	3		
Sometimes	11	4	0,000	0.676
Never	2	14		
Total Cholesterol Levels				
Good	42	13	0.374	-0.090
Border	27	7		
Danger	10	1		
LDL				
Good	11	3	0.783	-0.028
Border	31	9		
Danger	37	9		
HDL				
Good	52	9	0.096	0.168
Border	8	5		
Danger	19	7		
Triglycerides				
Good	31	8	0.884	-0.015
Border	33	10		
Danger	15	3		
Temporary Blood Glucose				
Normal	51	13	0.824	0.023
Abnormal	28	8		

The data above shows that the highest number of respondents suffered from kidney failureage ≥ 60 years, namely 29 respondents and the lowest in the age range < 50 years, namely 22 respondents. Meanwhile, the highest number of respondents who did not suffer from kidney failure were aged ≥ 60 years, namely 12 respondents. The results of statistical testing in this study show the p value = 0.129 > 0.05. Thus, it can be concluded that there is no relationship between the age of the respondents and the kidney failure suffered by the majority of respondents. The table above shows that 49 respondents who suffered from kidney failure were male. Thus, most of the respondents with kidney failure were male. Meanwhile, there

were 30 female respondents. The majority of respondents who did not have kidney failure were also men, namely 12 respondents and 9 women. The statistical test results above show the p value = 0.687 > 0.05. This shows that there is no relationship between gender and the kidney failure suffered by the respondent.

The table above shows that the majority of respondents who suffered from kidney failure were high school/high school graduates, namely 43 respondents out of 79 respondents who were diagnosed with kidney failure.Meanwhile, the lowest number of kidney failure patients was in patients who did not attend school. Meanwhile, the highest number of patients who were not diagnosed with kidney failure was high school/high school graduates and the lowest was in tertiary institutions. The statistical test results show the p value = 0.002 < 0.05. Thus, it can be concluded that there is a relationship between the respondent's education and the kidney failure suffered by the respondent. The relationship between the independent and dependent variables is negative, where the higher the respondent's education level, the lower the cases of kidney failure. The r value in this study is -0.311 which indicates the strength of a weak relationship. Meanwhile, the results of the R calculation found a value of 9.67%. This shows that there is an influence of the education variable of 9.67% on kidney failure and 90.33% outside the variable.

The data above shows that as many as 51 respondents who suffered from kidney failure had blood pressure > 140/90 mmHg, while the lowest were patients with blood pressure < 110/70 mmHg, namely 3 respondents. Respondents who were not diagnosed with kidney failure also mostly had blood pressure > 140/90 mmHg, namely 16 respondents and the lowest was also found in respondents with blood pressure < 110/70 mmHg, namely 1 respondent. The statistical test results above show the p value = 0.356 > 0.050.This shows that there is no relationship between blood pressure and kidney failure in respondents. The table above is a table that describes the relationship between treatment history and kidney disease. It is known that the majority of respondents who adhere to taking medication are diagnosed with kidney failure. There were 58 respondents who adhered to taking medication and were diagnosed with kidney disease. The lowest 2 respondents actually suffer from kidney disease but do not take medication. Meanwhile, respondents who were not diagnosed with kidney failure were also highest among respondents who did not take medication.

The statistical test results show that the p value = 0.000 < 0.05 so it can be concluded that there is a relationship between treatment history and kidney failure. The relationship between medication history and kidney failure is positive, meaning that the more respondents adhere to taking medication, the higher the incidence of kidney failure. The r value = 0.452 which indicates the strength of the relationship is weak. The results of the r calculation show an R value of 20.43%. This shows that the treatment history variable has an effect on kidney failure by 20.43%. while the other 79.57% came from outside the model. The data above shows that there were 66 respondents who complied with being diagnosed with kidney failure. Meanwhile, 2 respondents who were diagnosed with kidney failure never had control. Respondents who did not have kidney failure most often never had control. There were 14 respondents out of 21 respondents who did not have kidney failure. Meanwhile, 3 respondents complied with control and did not have kidney failure.

The statistical test above shows the p value = 0.000 < 0.05, which means there is a relationship between history of control and kidney failure suffered by the patient. The correlation between history of control and kidney failure showed a positive correlation. This means that if more respondents comply with the control, the cases of kidney failure will also increase, and vice versa, if the control history variable decreases, the cases of kidney failure

will also decrease. The r value = 0.676, which means the correlation between these two variables is moderate. The r calculation found a value of 45.69%. This shows that the control history variable has an influence on the incidence of kidney failure by 45.69%. Around 54.31% of the remainder is the influence of external variables. The data above shows that the majority of kidney failure sufferers have total cholesterol in the good category, namely 42 respondents. While the lowest is atThe total cholesterol level in the danger category was 10 respondents. Respondents who did not have kidney failure mostly had good total cholesterol levels, namely 13 respondents and 1 respondent was in the danger category. The statistical test above shows the p value = 0.374 < 0.05. Thus, it can be concluded that there is no relationship between total cholesterol levels and kidney failure.

Most kidney failure sufferers had LDL in the danger category, namely 37 respondents. Meanwhile, the lowest number of kidney failure sufferers had LDL in the good category, namely 11 respondents. Meanwhile, respondents who were not diagnosed with kidney failure had the highest LDL in the borderline and dangerous categories, namely 9 respondents each and the lowest in the good category, namely 3 respondents. The statistical test value above shows the p value = 0.783 > 0.05. So, it can be concluded that there is no relationship between LDL and the kidney failure suffered by the respondents. It can be seen in the table above that many respondents who were diagnosed with kidney failure had HDL in the good category. There were 52 respondents who suffered from kidney failure with good HDL category. Meanwhile, the 8 lowest kidney failure sufferers had an HDL category on the border between good and dangerous. Meanwhile, 9 respondents who were not diagnosed with kidney failure were in the good category. Meanwhile, the lowest is in the border category. The statistical test above shows the p value = 0.096 > 0.05 so it was concluded that there was no relationship between HDL and kidney failure suffered by the majority of respondents.

The data above found that many respondents diagnosed with kidney failure had borderline triglycerides, namely 33 respondents. Meanwhile, the lowest was in the danger category, namely 15 respondents. Apart from that, the highest number of respondents who did not have kidney failure were those who had triglycerides in the borderline category, namely 10 respondents, the lowest number of respondents in the danger category was 3 respondents. The table of statistical test values above shows the p value = 0.884 > 0.05. So, it was concluded that there was no relationship between the triglyceride variable and kidney failure in hypertensive patients. The data above shows that there were 51 kidney failure patients who had normal GDS. Meanwhile, 28 other patients had abnormal GDS. Most respondents who did not suffer from kidney failure had normal GDS, namely 13 respondents and 8 other respondents were abnormal. The statistical test results above show the p value = 0.824 > 0.05. It can be concluded that there is no relationship between GDS and kidney failure suffered by the patient.

DISCUSSION

Relationship between age and the incidence of kidney failure

The ongoing aging process at the age of over 40 years results in changes in the anatomy, physiology and biochemistry of a person's body. These changes often start at the cellular level, progress to the tissue level and ultimately to the organ level, which can influence homeostatic function. As a result of these changes, age is often used as a variable studied. One of them is kidney failure. Chronic renal failure is a condition of damage to the kidneys for ≥3 months in the form of structural or functional abnormalities of the kidneys, with/without a reduction in the glomerular filtration rate (GFR), including an imbalance in the composition of substances in the blood or urine and the presence or absence of disturbances in the results of imaging examinations.(Yelvita, 2022). Meanwhile, acute renal

failure is a rapid decrease (within hours to weeks) of glomerular filtration rate (GFR) which is generally reversible, followed by failure of the kidneys to excrete nitrogen metabolic waste, with/without fluid and electrolyte balance disorders.(Pitabuana, 2021).

The age variable in this study was grouped into age < 50 years, ≥ 50 years, and ≥ 60 years, where the distribution of chronic and acute kidney failure disease was dominated by those aged ≥ 60 years and not much different from those aged ≥ 50 years. In researchYelvita (2022)showed that the majority came from the middle adult age group (41-60 years). The results of this study show that there is no relationship between age and kidney failure in the inpatient room at Prof. Hospital. Dr. WZ Johannes Kupang City. This is in line with research conducted byBaroleh et al. (2019)at RSU Pancaran Kasih Manado. Meanwhile, other research. Other research conducted using the Chi-square test shows that there is a relationship between age and chronic kidney failure(Seli & Harahap, 2021).

Relationship between gender and the incidence of kidney failure

Gender is a condition of biological characteristics that defines humans as male or female (WHO, 2021). Gender differences between men and women in relation to kidney failure are influenced by the role of hormones in the body. This can occur because testosterone causes podocyte apoptosis induction which is associated with the development of glomerulosclerosis(Goldberg & Krause, 2016). In this study, it was found that there was no relationship between gender and the incidence of kidney failure. In line with research conducted byBaroleh et al. (2019)which shows that there is no relationship between gender and the incidence of kidney failure. Other research found a relationship between gender and chronic kidney failure in people aged >18 years in Indonesia in 2018 with the distribution mostly occurring in men (63.7%)(Yelvita, 2022).Seli and Harahap (2021)showed a relationship between gender and kidney failure.

Relationship between education and the incidence of kidney failure

Education is the result of a person's formal studies. Education level is often associated with a person's knowledge. People with a high level of education tend to have extensive knowledge, especially knowledge about health. Good knowledge about health can make someone more careful in maintaining health through a clean and healthy lifestyle. Education is also often associated with economic level. Good education with a good economy enables a person to live more prosperously in a livable house with better sanitation. These two things help a person reduce health problems, especially kidney failure. This is in line with various studies which show a strong correlation between education level and health status. Ross and Mirowsky in their research concluded that there is a positive effect of the length (years) of education on consistent health, arguing that the length of the school year can develop the capacity for effective life which will ultimately influence health, including working full-time, being able to carry out work efficiently. good, improving welfare, economy, self-control, greater social support, and a healthy lifestyle (Ross, 1999). This argument is based on "Human capital theory and status attainment model" (Gary S. Becker, 1964). School provides general skills, especially those related to cognitive, specific skills that are useful for work, social values, behavior and having important dispositions for achieving a goal (Sewell WH, 1975). Higher education teaches people to think more logically and rationally, to be able to see an issue from various sides so that they can better analyze and solve a problem. In addition, higher education improves the cognitive skills needed to be able to continue learning outside of school (Laflamme L, 2004). The results of this study show that there is a relationship between education level and the incidence of kidney failure in hypertensive patients.

Relationship between blood pressure and the incidence of kidney failure

Hypertension has an important role in the process of kidney failure. This can occur due to the intake of fat which is transferred by the blood to the cells through the blood vessels, which can cause thickening and narrowing of the blood vessel walls, which can lead to chronic kidney failure.(Making et al., 2022). Hypertension can also cause the blood vessels around the kidneys to constrict so that the flow of nutrients to the kidneys is disrupted and results in damage to kidney cells. If this condition persists for a long time, it can cause severe damage to the kidneys or what is usually called end-stage kidney failure which cannot be cured so sufferers can only be treated with hemodialysis or a kidney transplant.(Burnier & Damianaki, 2023). Long-term increased pressure and tension in the arterioles and glomeruli can cause the blood vessels in the kidneys to harden. Sclerotic lesions of small arteries, arterioles and glomeruli cause nephrosclerosis. The formation of lesions begins with plasma leakage through the intimal membrane of the vessel. This leak then leads to the formation of fibrinoid deposits on the medial membrane of the vessels, accompanied by progressive thickening of the vessel walls. The thickening that occurs makes the blood vessels become narrow and blocked. Blockage of arteries and small arteries can cause glomerular damage and renal tubular atrophy, damage all nephrons, and cause chronic kidney failure (Adhiatma et al., 2017). Research conducted using data from the Non-Communicable Disease Cohort Study aged 25-65 years showed that people with hypertension had a 3.71 times greater risk of developing chronic kidney failure than non-hypertension sufferers. Hypertension is also a risk factor for chronic kidney failure with a risk of around 5.652 times greater than that of non-hypertensive sufferers. The results of this study show that there is no relationship between blood pressure and the incidence of kidney failure(Liu et al., 2014).

Relationship between drug consumption and the incidence of kidney failure

Almost all (81.67%) CKD clients have no history of consuming drugs and a small portion (18.33%) have a history of consuming drugs, namely Paracetamol. Based on the results of data regarding the causes of CKD based on the history of previous drug use, it was found that some A small number of clients suffer from CKD caused by previous use of drugs. Drugs that affect kidney damage are drugs that are nephrotoxic. One of the drugs that have nephrotoxic properties is analgesic drugs. Analgesic drugs are dose dependent, which means that the more frequently you consume the larger the dose, the more damage it can cause to kidney tissue. Consuming this drug in the long term, every day for several years can make a person suffer from analgesic nephropathy, which is chronic kidney disease caused by the drug, which gradually leads to the end stage of kidney disease and requires permanent treatment such as hemodialysis to kidney transplantation. Non-prescription analgesic drugs are usually used for acute pain and are often also used as additional therapy for chronic diseases accompanied by pain. However, it has not been proven that this drug can cure neuropathic pain. There are three classes of non-prescription analgesics currently available on the market, namely the paracetamol group, the salicylate group including aspirin/acetylsalicylate, sodium salicylate, magnesium salicylate, choline salicylate, and the ibuprofen, nepraxon and ketoprofen derivatives (Kumala, 2016).

Because they have similar pharmacological properties to the salicylates and propionic acid derivatives, they are classified as non-steroidal anti-inflammatory drugs (NSAIDs). This drug is available in various brands, including as a generic drug and is often combined with additional medications or ingredients such as caffeine. These drugs are also often found in the composition of cough, cold and flu medicines. NSAID drugs have analgesic (pain relieving), antipyretic and anti-inflammatory properties. With different doses different effects can be obtained. There are several health conditions that must be considered when selecting

analgesic drugs (Kumala, 2016). A history of excessive use of analgesic drugs can cause analgesic nephropathy. Analgesic nephropathy is nephron damage due to analgesics. The use of analgesic drugs to relieve pain and suppress inflammation with a mechanism of action that suppresses prostaglandin synthesis. As a result, inhibition of prostaglandin synthesis causes renal vasocontraction, reducing blood flow to the kidneys and potentially causing glomerular ischemia. Analgesic drugs also induce interstitial nephritis which is always followed by glomerular damage and nephropathy which will accelerate the progression of kidney damage, papilla necrosis and chronic kidney failure (Kumala, 2016).

Based on research conducted by Restu Pranandari (2009), the results of the analysis show that a history of using analgesic drugs and NSAIDs is statistically related to the incidence of chronic kidney failure and the risk factors for using analgesic drugs and non-steroidal anti-inflammatory drugs are smaller than other risk factors in clients. hemodialysis (OR=0.160, $p<0.05$, Cl=0.074-0.347). Some epidemiological evidence shows that there is a relationship between excessive use of analgesic drugs and NSAIDs and the incidence of kidney damage or nephropathy. Analgesic nephropathy is nephron damage due to the use of analgesics. The use of analgesic drugs and NSAIDs to relieve pain and suppress inflammation (swelling) with a working mechanism of suppressing prostaglandin synthesis. As a result, inhibition of prostaglandin synthesis causes renal vasoconstriction, reduces blood flow to the kidneys, and potentially causes glomerular ischemia. Analgesic drugs and NSAIDs also induce interstitial nephritis which is always followed by mild glomerular damage and nephropathy which will accelerate the progression of kidney damage, papilla necrosis and chronic kidney failure. Analgesic drugs and NSAIDs cause nephrosclerosis which results in glomerular ischemia thereby reducing compensated GFR and non-compensated GFR or chronic kidney failure which in the long term can cause terminal kidney failure. This research shows that the cause of CKD in the hemodialysis room at the Jemursari Islamic Hospital in Surabaya is partly due to a history of previous drug consumption. It was found that men aged 40-60 years often consumed these drugs. The results of statistical testing in this study show that there is a relationship between drug consumption and the incidence of kidney failure.

Relationship between cholesterol, LDL, HDL and triglyceride levels with the incidence of kidney failure

Lipids are compounds containing carbon and hydrogen that are insoluble in water (hydrophobic) but soluble in organic solvents. The main lipid components that can be found in plasma are triglycerides, cholesterol and phospholipids. The most relevant serum lipid measurements are total cholesterol, triglycerides, HDL cholesterol, and LDL cholesterol. Increased cholesterol is closely related to increased cardiovascular disease. A number of studies have identified potential risk factors for cardiovascular disease including increased total cholesterol, triglycerides, LDL cholesterol, and decreased HDL concentrations which are associated with vascular abnormalities including blood pressure, where it is also known that high blood pressure is a risk of chronic kidney failure (Riswanto , 2010). Cholesterol is a fatty substance produced by the liver. Cholesterol can be found throughout the body and plays an important role in daily body functions (Simple Guide Cholesterol, 2007). Apart from that, cholesterol is a waxy substance and is like fat which is actually needed for our health. Cholesterol is an essential component of every cell and is needed by the body to perform many basic functions.

Cholesterol helps the liver produce bile, which is needed to digest fats, and is a building block of the adrenal glands and sex hormones. Cholesterol also forms a protective cloak around cell walls and the myelin sheath of nerves, and works as a lubricant on artery walls,

helping blood flow smoothly. Cholesterol in balanced amounts is very important for the body. Low cholesterol levels or below 135 are a sign of adrenal gland stress, severe liver damage, and auto-immune disorders. Low cholesterol levels have also been linked to cancer and general impaired immune function manifested through fatigue. Meanwhile, increasing cholesterol is closely related to increasing cardiovascular disease. A number of studies have identified potential risk factors for cardiovascular disease, including an increase in total cholesterol, triglycerides, LDL cholesterol, and a decrease in 35 HDL concentrations which are associated with vascular abnormalities including blood pressure (Hasdianah, 2014). Cholesterol is carried through the bloodstream in 2 protein components: LDL and HDL. LDL is considered "bad" cholesterol, or damaging, because it carries cholesterol from the liver to the body's cells and blood vessels where it then resides in the cells lining the walls of the arteries. Meanwhile, HDL is considered "good", or protective, because it carries cholesterol from the walls of the arteries to the liver, where it is broken down to be removed from the body. If cholesterol levels in the body exceed normal values, it will cause narrowing and hardening of the blood vessels, known as atherosclerosis. which disrupts blood circulation, causing hypertension (Suprapto, 2014).

HDL (high density lipoprotein) is often referred to as good cholesterol. Experts say that HDL can prevent arterial disease, so HDL is actually the opposite of LDL. HDL can take excess cholesterol from body cells to be returned to the liver. Once in the liver, this cholesterol can be broken down into other substances, for example bile which will be excreted from the body during the process of digesting fat from food (Kurniawan, 2012). Because HDL itself is part of cholesterol, when a person's cholesterol is high, HDL tends to decrease while LDL increases and triglycerides increase. It is recommended that HDL cholesterol levels should be higher than LDL cholesterol. Because HDL cholesterol is an aid in preventing fatty plaque deposits caused by LDL cholesterol (Hasdianah, 2014). LDL is a type of lipoprotein that we often call bad cholesterol. LDL is responsible for transporting cholesterol from the liver to body cells to be used as a basic material for building and maintaining cell walls. If too much cholesterol is transported, or too much for the body's cells to use, a dangerous condition will arise due to the excessive amount of LDL in the body. This type of LDL lipoprotein can increase the risk of arterial blood vessel disease (Kurniawan, 2012). In people who have high cholesterol, this is usually accompanied by an increase in LDL levels, a decrease in HDL, and an increase in triglycerides. Decades of research have shown that cholesterol only hides in the cells lining the arteries. It is now thought that the oxidation process is what makes the LDL component of cholesterol so dangerous. Oxidation occurs when the antioxidant system in the body cannot neutralize unstable molecules that change negatively and are called free radicals. Free radicals occur naturally in the body or can be initiated by exposure to environmental pollutants such as cigarette smoke, chemicals, drugs, heavy metals and stress (Suprapto, 2014).

Triglycerides are fats found in meat and productsmilk, and cooking oil, and is the main source of energy for the body. Triglycerides are also found in body fat stores and come from fat breakdown in the liver. Like cholesterol, triglycerides are fats that circulate in the blood. Like LDL cholesterol, high triglieride levels are also associated with an increased risk of other vascular diseases. People with high triglyceride levels often have high cholesterol levels, high LDL cholesterol and low HDL cholesterol. This is like an interrelated triad, although high triglyceride levels carry their own risks, these risks increase when accompanied by low HDL cholesterol levels. Triglycerides at normal levels are very necessary for the body. High triglyceride levels are usually caused by obesity and a lifestyle of lack of exercise. Diabetes, kidney disorders and certain medications can also increase

triglyceride levels. Triglyceride levels of 200 mg/dL or more are one of the risk factors for metabolic syndrome which increases the risk of heart disease, diabetes and stroke (Suprapto, 2014).

Kidney disease and hypertension are related, kidney failure can cause hypertension and vice versa. If not treated, it will progress to terminal kidney failure which requires kidney replacement therapy in the form of dialysis or a kidney transplant. One of the causes of hypertension is an increase in lipid profile levels. Lipid profile is lipoprotein in blood serum which consists of total cholesterol, HDL, LDL, and TG. The results of this study show that there is no relationship between total cholesterol, LDL, HDL and triglycerides with kidney failure. The results of other studies also show that there is no relationship between total cholesterol, HDL, LDL and triglycerides with the incidence of kidney failure(Arifa et al., 2017)

The relationship between blood sugar and kidney failure

Increased glucose levels in the blood caused by the amount of insulin or insulin damage. Diabetes mellitus is a disorder of carbohydrate, protein and fat metabolism. Glucose will bind to protein, causing structural changes and causing protein leakage into the urine. This situation which continues continuously will cause macroalbuminoria, namely the release of more protein in the urine which will lead to advanced stage nephropathy where the glomerular filtration rate decreases and can only be helped by hemodialysis or kidney transplantation.(Smeltzer, 2016).

CONCLUSION

There is no relationship between the factors age, gender, blood pressure, cholesterol levels, LDL levels, HDL levels and the incidence of chronic kidney failure in hypertensive patients in the inpatient ward of Prof. Dr. WZ Johannes Regional Hospital, Kupang City. There is a relationship between educational factors and treatment history with the results of statistical testing of the relationship between age and kidney failure with the incidence of chronic kidney failure in hypertensive patients in the inpatient ward of Prof. Dr. WZ Johannes Regional Hospital, Kupang City.

REFERENCES

Arifa, SI, Azam, M., & Handayani, OWK (2017). Factors Associated with the Incidence of Chronic Kidney Disease in Hypertension Sufferers in Indonesia. Indonesian Public Health Media, 13(4), 319. https://doi.org/10.30597/mkmi.v13i4.3155

Baroleh, JM, Ratag, TB, G, FLF, & Langi. (2019). Factors Associated with Chronic Kidney Disease in Patients in the Outpatient Installation of RSU Pancaran Kasih Manado. Public Health, 8(7), 8.

Burnier, M., & Damianaki, A. (2023). Hypertension as Cardiovascular Risk Factor in Chronic Kidney Disease. Circulation Research, 132(8), 1050–1063. https://doi.org/10.1161/CIRCRESAHA.122.321762

Chen, T. K., Knicely, D. H., & Grams, M. E. (2019). Chronic Kidney Disease Diagnosis and Management: A Review. JAMA, 322(13), 1294–1304. https://doi.org/10.1001/jama.2019.14745

Goldberg, I., & Krause, I. (2016). The Role of Gender in Chronic Kidney Disease. European Medical Journal, April, 58–64. https://doi.org/10.33590/emj/10312319

Hannan, M., Ansari, S., Meza, N., Anderson, A.H., Srivastava, A., Waikar, S., Charleston, J., Weir, M.R., Taliercio, J., Horwitz, E., Saunders, M.R., Wolfrum, K., Feldman, H.I., Lash, J.P., & Ricardo, A.C. (2021). Risk Factors for CKD Progression: Overview of Findings from the CRIC Study. Clinical Journal of the American Society of Nephrology : CJASN, 16(4), 648–659. https://doi.org/10.2215/CJN.07830520

Hofmeyer, A., & Taylor, R. (2021). Strategies and resources for nurse leaders to use to lead with empathy and prudence so they understand and address sources of anxiety among nurses practicing in the era of COVID-19. Journal of Clinical Nursing, 30(1–2), 298–305. https://doi.org/10.1111/jocn.15520

Ministry of Health. (2018). Health Research. https://kesmas.kemkes.go.id/assets/upload/dir_519d41d8cd98f00/files/Hasil-riskesdas-2018_1274.pdf

Liu, M., Li, X.-C., Lu, L., Cao, Y., Sun, R.-R., Chen, S., & Zhang, P.-Y. (2014). Cardiovascular disease and its relationship with chronic kidney disease. European Review for Medical and Pharmacological Sciences, 18(19), 2918–2926.

Making, M.A., Betan, Y., Israfil, I., & Tuesday, P. (2022). Factor Analysis of Interdialytic Weight Gains (IDWG) of Hemodialysis Patients at RSUD Prof. Dr. WZ Johannes Kupang City. NURSING UPDATE: Scientific Journal of Nursing P-ISSN: 2085-5931 e-ISSN: 2623-2871, 13(3), 192–205.

Pitabuana, AR (2021). Incidence, Risk Factors and Outcomes of Acute Kidney Disorders in Children in the Pediatric Intensive Care Unit at RSUP Dr. Wahidin Sudirohusodo 2020 (Vol. 10).

Seli, P., & Harahap, S. (2021). The Relationship Of Risk Factors With The Incident Rate Of Chronic Kidney Disease In Hospitals. Haji Medan In 2020 Relation Of Risk Factors With Chronic Kidney Disease At Haji Hospital Medan 2020. Stm Medical Journal, Vol. 4 No.(II), 129–136.

Smeltzer, Facebook. &. (2016). Textbook of Medical-surgical Nursing. Lippincott Williams & Wilkins Pty, Limited. https://books.google.co.id/books?id=FobljwEACAAJ

Teo, BW, Chan, GC, Leo, CCH, Tay, JC, Chia, Y.-C., Siddique, S., Turana, Y., Chen, C.-H., Cheng, H.-M., Hoshide, S., Minh, H. Van, Sogunuru, G. P., Wang, T.-D., & Kario, K. (2021). Hypertension and chronic kidney disease in Asian populations. Journal of Clinical Hypertension (Greenwich, Conn.), 23(3), 475–480. https://doi.org/10.1111/jch.14188

Vallianou, N.G., Mitesh, S., Gkogkou, A., & Geladari, E. (2019). Chronic Kidney Disease and Cardiovascular Disease: Is There Any Relationship? Current Cardiology Reviews, 15(1), 55–63. https://doi.org/10.2174/1573403X14666180711124825

Yelvita, F.S. (2022). Factors Associated with Chronic Kidney Failure in Population Aged > 18 Years in Indonesia in 2018. In הארץ (Issue 8.5.2017).

WHO. 2021 https://www.who.int/westernpacific/health-topics/sexual-health