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ANALYSIS OF RISK FACTORS FOR CHRONIC KIDNEY FAILURE

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ABSTRACT
The background of this study focused on the increasing incidence of chronic renal failure at Kudungga Sangatta Hospital, East Kutai Regency, which is a serious concern in an effort to improve the quality of public health services. The general objective was to analyze the risk factors of chronic renal failure in Kudungga Sangatta Hospital, East Kutai Regency. This type of research is an analytic observational research with case control design or case control study. The non-random sampling method is purposive sampling as many as 140 people, as for data collection techniques, namely, the preparation stage (preparing a research permit, and conducting a preliminary study), after that there is an implementation stage (collecting respondent data, sorting samples according to sample criteria in two sample groups, filling out questionnaire data, and collecting research instruments). The data analysis techniques in the study were editing, coding, shorting, data entry, and data cleaning. Age was significantly associated with the incidence of acute renal failure ($P < 0.001$). Family history of hypertension is significantly associated with the incidence of acute renal failure ($P < 0.001$, OR = 69.750). Family history of diabetes mellitus was not significantly associated with the incidence of acute renal failure ($P = 0.806$). Taking Analgesic and NSAID drugs were not significantly associated with the incidence of acute renal failure ($P > 0.05$). The conclusion is that there is a relationship between age and family history of hypertension with the incidence of chronic renal failure and there is no relationship between family history of diabetes mellitus, and using analgesic drugs and NSAIDs is not significantly related to the incidence of acute renal failure at Kudungga Sangatta Hospital, East Kutai Regency.

Keywords: age; anlgesic and nsaid medications; diabetes mellitus; family history of hypertension

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INTRODUCTION

Chronic renal failure disease is a pathophysiological process with various causes that can cause progressive decline in kidney function and a decrease in glomerular filtration rate (GFR) of less than 60 which is characterized by a slow decline in glomerular filtration rate over a long period of time. Failure of kidney function causes disruption of meta-bolism and fluid balance resulting in a buildup of metabolic products.Chronic kidney disease is a disease that is closely related to the aging process. As the age increases, the possibility of developing chronic kidney disease will increase, this happens because physiologically the kidneys will experience a decrease in function due to the reduction in the number of neufrons at the age of 50 years. So suffering from chronic kidney disease in adulthood has a high risk of death (CDC, 2019).

The number of people suffering from renal failure in East Kalimantan Province has increased from 0.10% in 2013, taking into account the total population of 3,331,000, resulting in approximately 3,331 people diagnosed with chronic renal failure. This figure became 0.42% in 2018, taking into account the total population of 3,620,000 people so that about 15,204 people in Indonesia were diagnosed with chronic kidney failure (Ministry of Health, 2018). East Kutai is an expansion district from Kutai Kartanegara Regency in 1999. As a new district, East Kutai is improving in terms of services to the community. East Kutai Regency has a Regional General Hospital which is a type B hospital based on the Decree of the Minister of Health No. Hk.0203/i: HK.0203/I/0552/2015. Data on patients with chronic

kidney failure at Kudungga Sangatta Hospital, obtained in 2019 as many as 37 cases, in 2020 21 cases 2021 as many as 16 cases, in 2022 as many as 48 cases and in 2023 the period January to August as many as 70 cases (Kudungga Hospital medical record data, 2023) Source: Kudungga Hospital medical record data, 2023. The general objective of this study is to analyze the risk factors for the incidence of chronic renal failure at Kudungga Sangatta Hospital, East Kutai Regency.

METHOD

This type of research is analytic observational research with a case control design or case control study which is an epidemiological study design that studies the relationship between exposure (research factors) and disease based on exposure status (Dahlan, 2017). The study was conducted from February 2024 to April 2024 at Kudungga Hospital Sangatta, East Kutai Regency.The population in this study were outpatients who sought treatment at the internal medicine clinic recorded until the period January to June 2023 as many as 1553 people. The sample size was calculated using data on the number of patients with chronic renal failure in the case group of 70 people and the control group was also 70 people with a ratio of 1: 1. By using matching outpatients at the internal medicine clinic so that the total sample size is 140 people, as for data collection techniques, namely, the preparation stage (preparing a research permit, and conducting a preliminary study), after that there is an implementation stage (collecting respondent data, sorting samples according to sample criteria in two sample groups, filling out questionnaire data, and collecting research instruments). The data analysis techniques in the study were editing, coding, shorting, data entry, and data cleaning.

RESULT

Table 1.
Frequency Distribution of Respondents (n=140)

	Variable	f	%
Age	16-25	9	6.4
	26-35	13	9.3
	36-45	27	19.3
	46-55	50	35.7
	56-65	28	20
	66-75	12	8.6
	76-85	1	0.7
Gender	Male	71	50.7
	Famale	69	49.3
Education	Elementary school graduate	26	18.6
	Junior high school graduate	26	18.6
	High school graduate	71	50.7
	Bachelor's degree	13	9.3
	Not in school	4	2.9
Work	Private employee	55	39.3
	ASN/TNI/POLRI	4	2.9
	Retired	3	2.1
	Farmer	14	10
	Laborer	2	1.4
	Housewife	52	37.1
	Not working	10	7.1
	Tribes		
	Jawa	37	26.4
	Bugis	31	22.1
	Banjar	14	10
	Kutai	4	2.9
	Dayak	6	4.3
	Lainnya	48	34.3

Based on the table above, it is known that the frequency distribution of respondent charac eristics, the most respondents were 50 respondents (35.7%) had an age category of 46 to

55 years, the frequency distribution of gender obtained 71 respondents (50.7%) were male and 69 respondents (49.3%) were female, the frequency distribution of education level obtained 71 respondents (50.7%) had a high school education, the frequency distribution of the type of work as many as 55 respondents (39.3%) answered that they worked as private employees, the frequency distribution based on ethnicity obtained 37 respondents (26.4%) Javanese.

Table 2.
Relationship between Age and Acute Renal Failure in Respondents

Variable	Age	Acute Kidney Failure
Age	1.000	
Correlation	.	0.249
CoefficientPvalue		<0.001
Acute Kidney Failure		
Correlation	0.249	1.000
CoefficientPvalue	<0.001	.

Based on the table, the P value <0.001 (P value <0.05) indicates that there is a significant relationship between age and the incidence of acute renal failure.

Table 3.
Relationship between Hypertension History and Acute Kidney Failure in Respondents

History of Hypertension	Acute Kidney Failure						P value	OR
	Yes		No.		Total			
	f	%	f	%	f	%		
Available	63	88.7	8	11.3	71	100	<0.001	69.750
Not Available	7	10.1	62	89.9	69	100		

Based on the table, it is known that among respondents who have a family history of hypertension, the highest proportion is among respondents who experience acute kidney failure (88.7%), then among respondents who do not have a family history of hypertension, the highest proportion is among respondents who do not experience acute kidney failure (89.9%). The results of chi-square analysis showed a p value of <0.001 (p < 0.05) which means that there is a significant relationship between family history of hypertension and the incidence of acute renal failure.

Table 4.
Relationship between Diabetes Mellitus History and Acute Kidney Failure in Respondents

Diabetes Mellitus History	Acute Kidney Failure						P value	OR
	Yes		No		Total			
	f	%	f	%	f	%		
Available	10	45.5	12	54.5	22	100	0.816	0.806
Not Available	60	50.8	58	49.2	118	100		

Based on the table above, it is known that among respondents who have a family history of diabetes mellitus, the highest proportion is among respondents who do not experience acute kidney failure (54.5%), then among respondents who do not have a family history of diabetes mellitus, the highest proportion is among respondents who experience acute kidney failure (50.8%). The results of chi-square analysis showed a p value of 0.806 (p> 0.05) which means that there is no significant relationship between family history of diabetes mellitus and the incidence of acute renal failure.

Table 5.
The Relationship of Taking Analgesic and NSAID Drugs with Acute Kidney Failure in Respondents

Taking Medication	Acute Kidney Failure						P value	OR
	Yes		No		Total			
	f	%	f	%	f	%		
Yes	4	50	4	50	8	100	1.000	1.000
No	66	50	66	50	132	100		

Based on the table, it is known that among respondents who took Analgesic and NSAID

drugs, the highest proportion of respondents who experienced acute kidney failure and did not experience acute kidney failure had the same proportion (50%), then among respondents who did not take Analgesic and NSAID drugs, the highest proportion of respondents who experienced acute kidney failure and did not experience acute kidney failure had the same proportion (50%). The results of chi-square analysis showed a p value of 1,000 (p> 0.05) which means that there is no significant relationship between taking Analgesic and NSAID drugs with the incidence of acute renal failure.

DISCUSSION

In line with other body systems, the kidneys undergo significant structural and consequent physiological changes with age. These changes affect all parts of the kidney, including the glomerulus, tubules, and renal vasculature with resulting changes in renal function including decreased filtration, decreased vascular response, and changes in fluid and sodium balance. In addition to decreased glomerular filtration, kidney mass also decreases. Normally, kidney mass is 400 grams and will decrease by 25%, or as low as 300 grams by the age of 90 years. Other research states that those aged 45 years and below are more at risk of kidney failure due to lifestyle patterns and frequent consumption of glucose. At a young age and the late elderly have the same portion of the incidence of chronic kidney failure due to frequent consumption of stamina drinks which contain caffeine and glucose which are not good for the body (Harahap, 2018). The ageing process is associated with molecular, structural and functional changes in various organ systems, including the kidneys. During the aging process, the kidney undergoes a progressive decline in function as well as macroscopic and microscopic histologic changes. This leads to the possibility that age is one of the factors in chronic kidney disease.

A person is diagnosed with hypertension if their blood pressure is measured on two different days, systolic blood pressure ≥140 mmHg and systolic ≥90mmHg (WHO, 2019). Hypertension is one of the signs of chronic kidney disease. In addition, hypertension is the leading cause of chronic kidney disease in all high-income and middle-income countries, and many low-income countries. Several studies have consistently reported an increased risk of chronic kidney disease and progressive development of chronic kidney disease with worsening blood pressure control (Webster et al., 2017).Hypertension is both a risk factor and a powerful effect of chronic kidney disease. One of the main target organs damaged by hypertension is the kidney which is caused by hypertensive nephrosclerosis. Malignant nephrosclerosis can cause ischemic glomeruli and damage to the kidneys. In the study of Saminathan et al. (2020) in Malaysia, those with hypertension have a 3.7 times risk of getting chronic kidney disease compared to those without hypertension. This is in line with the high prevalence of hypertension which is also around 30% in Malaysia. Research conducted by Hussien et al. (2020), Xue et al. (2014), Okwuonu et al. (2017), Anupama and Uma (2014) showed that hypertension is one of the main risk factors for the incidence of chronic kidney disease.

High blood sugar levels in the blood cause the kidneys to work harder to filter blood in the kidneys, which then if it happens continuously will cause the kidneys to leak. The initial stage that occurs is the leakage of albumin protein that comes out through the urine, then develops and causes a decrease in the filtering function of the kidneys (Pongsibidang, 2017). In the studies of Poudyal et al. and Olanrewaju et al., diabetes mellitus was the strongest risk factor for the incidence of chronic kidney disease with an AOR of 3.2 and 6.41. Meanwhile, in the study of Xue et al. in China, diabetes mellitus was an independent factor for the incidence of chronic kidney disease. The risk factor of diabetes mellitus has a very strong association in the study of Anupama et al. where the results of logistic regression analysis showed that diabetes has a 2 times higher risk of getting chronic kidney disease.Use of analgesic drugs and drug abuse The use of analgesic drugs and

NSAIDs to relieve pain and suppress inflammation (swelling), if used excessively will cause damage to the kidneys. The way analgesic drugs and NSAIDs work is by suppressing the synthesis of prostatglandins, thus causing renal vasoconstriction, reducing blood flow to the kidneys, and can cause glomerular ischemia. Analgesic drugs and NSAIDs also induce intertitial nephritis which is always followed by mild glomerular damage and netropathy that will accelerate kidney damage, papilla necrosis, and progressive chronic kidney disease.The consumption of drugs for a certain period of time will trigger the occurrence of chronic kidney disease. This is caused by decreased kidney function or kidney damage. Exposure to nephrotoxins often occurs in hospitalized patients (Luyckx et al., 2017). There are about 26 types of nephrotisin drugs that can cause kidney problems, namely drugs with antibiotics, analgesics, inferon (IFN), Proton Pump Inhibitors (PPIs), and so on (Sari, 2016).

CONCLUTION

Based on the results of research conducted at Kudungga Sangatta Hospital, East Kutai Regency in 2024, it is known that there is a significant relationship between age and family history of hypertension with the incidence of chronic renal failure. This indicates that advanced age and family history of hypertension increase the risk of chronic renal failure. Meanwhile, the variables of family history of diabetes and consumption of analgesic and NSAID drugs did not show a significant association with the incidence of chronic renal failure at the location and period of this study. These findings are expected to be the basis for prevention efforts and early detection of risk factors for chronic renal failure in the community, especially in the East Kutai region.

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