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ANALYSIS OF RISK FACTORS RELATED TO RECURRENCE OF CORONARY HEART DISEASE

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ABSTRACT

Background: Coronary heart disease (CHD) was the biggest contributor to mortality and morbidity in the world. Patients with coronary heart disease were prone to recurrent cardiac events, so it was necessary to control the risk factors for coronary heart disease, including history of hypertension, dyslipidemia, diabetes mellitus, obesity and compliance with taking medication. **Objective:** This study aimed to analyze the risk factors associated with recurrence of coronary heart disease in one hospital. **Methods:** Observational analytic with a retrospective cohort approach was used with total sampling technique. The sample size is 189 medical records of CHD patients. Data analysis used logistic regression. **Results:** The results showed that risk factors of CHD were the history of hypertension (42.3%), dyslipidemia (59.8%), diabetes mellitus (17.5%), obesity (0%), adherent in taking medication (69.3%) and experienced recurrence of CHD (72.5%). The results of statistical tests using the chi-square test with $\alpha = 0.05$ were known to have a significant relationship with CHD recurrence, including diabetes mellitus ($p = 0.009$), medication adherence ($p = 0.033$). Multivariate results using logistic regression showed that the most influential factor for CHD recurrence was diabetes mellitus with a value ($p= 0.02$, OR = 4.489). **Conclusion:** Patients suffering from diabetes mellitus were at risk of experiencing recurrence of CHD.

KEYWORDS: Risk Factors, Recurrence, Coronary Heart Disease.

INTRODUCTION

Coronary heart disease (CHD) is the biggest contributor to mortality and morbidity in the world. Data from the National Household Health Survey investigated that mortality due to CHD was 26% in 2010. The results of the Basic Health Research (Riskesdas) in 2013 showed the prevalence of CHD by 1.5% or around 2,650,340 people in Indonesia. Coronary heart disease in the East Java region is close to the National prevalence, which reaches 1.2%. The results of the 2013 Riskesdas showed that CHD was the 7th highest category of non-communicable diseases in Indonesia, with the highest prevalence of East Java at 375,127 people.[1]

Non-modifiable risk factors are family, age, gender and medical record. Other risk factors which can be changed or modifiable factors are high blood pressure (hypertension), smoking, high blood sugar (diabetes mellitus), dyslipdemia (abnormal metabolism of fat), obesity, reducing physical activity, diet, drinking alcohol and stress.[2]

Preliminary studies showed that 398 patients with CHD were treated in the hospital monthly. While those who experienced recurrence and rehospitalization of CHD were 42% or around 167 patients per month. This study aimed to describe and analyze risk factors for history of hypertension, dyslipidemia, diabetes mellitus, obesity and compliance with taking medication with CHD recurrence, and to determine the risk factors which had a strong association with CHD recurrence.

MATERIALS AND METHODS

This study was carried out in a hospital which was located in Surabaya, East Java, Indonesia during January-June 2018. This was an analytic observation with a retrospective cohort approach. The sample size in this study was 189 medical records. The sampling technique was total sampling technique. The inclusion criteria of the study were all patient medical records at the hospital with period of January-June 2018 diagnosed with CHD and complete medical record data; includes patient register numbers, age, gender, total cholesterol, hypertension (systolic and diastolic blood pressure),

diabetes mellitus (fasting blood sugar levels), diagnosis of CHD and not CHD. The exclusion criteria are uncomplete medical record data. The independent variables of this study included: history of hypertension, dyslipidemia, diabetes mellitus, obesity and medication compliance. The dependent variable is recurrence of coronary heart disease.

Data collected includes secondary data taken from medical record data. The analysis used was univariate analysis, bivariate analysis with Chi Square statistical test and multivariate analysis using logistic regression. The whole process of processing and analyzing SPSS program data.

RESULTS AND DISCUSSION

Based on medical records retrospectively, 189 medical records were obtained.

Table 1: Frequency distribution of respondents based on risk factors: History of Hypertension, Dyslipidemia, Diabetes Mellitus, History of Obesity, and Compliance with Medication.

		Frequency	Percentage
History of Hypertension	Absent	109	57.7%
	Present	80	42.3%
	Total	189	100.0%
Disiplidemia	Absent	76	40.2%
	Present	113	59.8%
	Total	189	100.0%
Diabetes Mellitus	Absent	156	82.5%
	Present	33	17.5%
	Total	189	100.0%
History of obesity	Absent	189	100.0%
	Present	0	.0%
	Total	189	100.0%
Compliance with medication	Comply	131	69.3%
	Non comply	58	30.7%
	Total	189	100.0%
Recurrence of CHD	No recurrent	52	27.5%
	Recurrent	137	72.5%
	Total	189	100.0%

Based on table 1 it can be seen that out of 189 data obtained with history of hypertension (42.3%), dyslipidemia (59.8%), diabetes mellitus (17.5%), obesity (0%), adherent taking medication (69.3%) and experienced recurrence of CHD (72.5%).

Relationship between Hypertension Dislipidemia, Diabetes Mellitus, History of Obesity, and Compliance with Medication with Recurrence of Coronary Heart Disease.

Table 2: History of Hypertension with CHD Recurrence.

			Recurrence		Total
			Absent	Present	
History of Hypertension	Absent	n	34	75	109
		%	31.2	68.8	100.0
	Present	n	18	62	80
		%	22.5	77.5	100.0
Total		Σ	52	137	189
		%	27.5	72.5	100.0
Chi square		Sig.Pearson Chi Square = 0.186			

Based on table 2, it was known that those who did not have a history of hypertension, most experienced recurrence of CHD (68.8%), while respondents who had a history of hypertension almost all experienced recurrence of CHD (77.5%). Sig.Pearson Chi-Square value is 0.186 which is greater than the error tolerance value (α) = 5%. So it was concluded that the variable history of hypertension was not significant or there was no association with the risk of CHD recurrence.

Table 3: Dyslipidemia with recurrence of CHD.

			Recurrence		Total
			Absent	Present	
Dyslipidemia	Absent	n	24	52	76
		%	31.6	68.4	100.0
	Present	n	28	85	113
		%	24.8	75.2	100.0
Total		Σ	52	137	189
		%	27.5	72.5	100.0
		Sig.Pearson chi Square = 0.305			

Based on table 3, most patients experienced recurrence of CHD (75.2%), while most respondents who did not meet the criteria for dyslipidemia experienced recurrence of CHD (68.4%). Sig. Pearson Chi-Square is 0.305 which is greater than the error tolerance value (α) = 5%. So it was concluded that the variable dyslipidemia was not significant or there was no relationship with recurrence of CHD.

Table 4: Diabetes Mellitus with CHD Recurrence.

			Recurrence		Total
			Absent	Present	
Diabetes Militus	Absent	n	49	107	156
		%	31.4	68.6	100.0
	Present	n	3	30	33
		%	9.1	90.9	100.0
Total		Σ	52	137	189
		%	27.5	72.5	100.0
		Sig.Pearson chi Square = 0.009			

Based on table 4, more than half respondents experienced recurrence of CHD (68.6%), almost all respondents who suffered from diabetes mellitus experienced recurrence of CHD (90.9%). Sig.Pearson Chi-Square value is 0.009 which is much smaller than the error tolerance value (α) = 5%. So it was concluded that the variable diabetes mellitus had a significant relationship to recurrence of CHD.

Table 5: History of obesity with CHD Recurrence.

			Recurrence		Total
			Absent	Present	
History of obesity	Absent	n	52	137	189
		%	27.5	72.5	100.0
Total		Σ	52	137	189
		%	27.5	72.5	100.0
		Sig.Pearson chi Square = a (constant)			

Based on table 5, it was known that those who did not have a history of obesity, experienced recurrence of CHD (72.5%), while respondents with a history of obesity were not found. So that referring to the data, statistically, the value of the relationship between the obesity history factor and the risk of CHD recurrence is statistically calculated, because the variable history of obesity is not having variance values or variants with zero. Sig. Pearson Chi-Square is a constant.

Table 6: Compliance with medication and CHD Recurrence.

			Recurrence		Total
			Absent	Present	
Compliance	Comply	n	30	101	131
		%	22.9	77.1	100.0
	Not comply	n	22	36	58
		%	37.9	62.1	100.0
Total		Σ	52	137	189
		%	27.5	72.5	100.0
		Sig.Pearsonchi Square = 0.033			

Based on table 6, it was known that from respondents who obediently took medication had experienced recurrence of CHD (77.1%), while respondents who did not adhere to taking medication had experienced recurrence of CHD (62.1%). Sig. Pearson Chi-Square value is 0.033 which is smaller than the error tolerance value (α) = 5%. So it was concluded that the variable adherence to taking medication had a significant relationship to recurrence of CHD.

Table 7: Multivariante analysis.

Independent Variabel	P value	OR
History of Hypertension	.739	1.129
Dyslipidemia	.279	1.461
Diabetes Mellitus	.020	4.489
Compliance with medication	.039	.483

Based on table 7 above, there are 4 independent variables included in the model: history of hypertension, dyslipidemia, diabetes mellitus, and medication compliance. While the history of obesity is not included in the model, so that based on statistical tests it is known that this variable does not form a regression model of CHD recurrence.

There are four risk factors for recurrence of CHD, it is known that the most dominant independent variable affecting recurrence of coronary heart disease is the variable diabetes mellitus, because it has the highest OR value (OR = 4,489.

Relationship Between Hypertension Factors and Recurrence of Coronary Heart Disease

Based on Chi square test results, it is known that the Sig.Pearson Chi-Square value is 0.186 which is greater than the error tolerance value (α) = 5%. So it was concluded that the variable history of hypertension was not significant or there was no association with CHD recurrence. This is not in accordance with previous study which stated that high blood pressure causes CHD, because blood pressure causes increased pressure on the arterial wall, and causes endothelial damage, which triggers atherosclerosis in the walls of blood vessels causing an increase in blood vessels. So that there is a synergy between blood pressure and atherosclerosis.[3]

High blood pressure continuously causes damage to the arterial system slowly. The artery undergoes hardening caused by fatty deposits on the wall, thus narrowing the lumen contained in the blood vessels which will prevent the blood flow. If the coronary arteries are affected, it causes coronary heart disease.[4,5]

Relationship Between Dyslipidemia Factors and Recurrence of Coronary Heart Disease

Respondents who either had dyslipidemia and those who did not have it were found to have no significant difference between the incidences of the risk of relapse and risk or recurrence of CHD. Based on Chi square test results, the value of Sig. Pearson Chi-Square of 0.305 which is greater than the error tolerance value (α) = 5%. So it was concluded that the variable dyslipidemia had a significant but not significant effect on the risk of CHD recurrence.

The results of the study showed that the presence of dyslipidemia had a risk of 2.88 times greater for CHD compared to those who did not experience dyslipidemia (OR = 2.88; 955% CI = 11.1-77.11). Dyslipidemia also had a statistically significant association for CHD at <45 years of age (p = 0.029).[6]

High cholesterol levels in the blood cause cholesterol deposits in the blood vessel walls or are called plaque cholesterol. The deposition of calcium ions in the plaque cholesterol causes the pIaque that has been softened to become thick and stiff. This causes the blood vessel walls to become stiff and inelastic. In addition, with the presence of hardened plaque cholesterol causes the inner walls of the blood vessels to become narrow and not slippery, so that the blood supply to these organs becomes reduced. If hardening occurs in the arteries that supply blood to the heart (coronary arteries), coronary heart disease (CHD) occurs.[7]

Relationship Between Diabetes Mellitus With Recurrence of Coronary Heart Disease

Respondents, who did not suffer from diabetes mellitus or those suffering from diabetes mellitus, were known to have a large difference between the incidence of the risk of relapse and not experiencing recurrence of CHD. Based on Chi square test results, it is known that the Sig.Pearson Chi-Square value is 0.009 whereas it is smaller than the error tolerance value (α) = 5%. So it was concluded that the variable diabetes mellitus had a significant effect on the risk of CHD recurrence.

DM referred to in this study is a condition experienced by respondents with a level of GDP> 126 mg / dl when declared suffering from CHD and before the respondents did not have a history of GDP> 126 mg / dl. People with diabetes mellitus tend to have atherosclerosis at an earlier age and the disease that is caused is faster and more severe in diabetics than in non-diabetes. Insulin plays a major role in lipid metabolism and abnormalities in lipids are often found in people with diabetes. Serum cholesterol and low density lipoprotein cholesterol are often higher in diabetic patients as well as lower high density lipoproteins in diabetic patients.[4]

Relationship Between Obesity and Recurrence of Coronary Heart Disease

Based on data, all respondents did not have history of obesity experienced recurrence of CHD. So it cannot be calculated the value of the relationship between the history of obesity factors to the risk of CHD recurrence, because the variable data on obesity history is not having a variance value or variance with zero. Based on Chi square test results, the value of Sig. Pearson Chi-Square is a constant.

Data from Framinghamm shows that if each individual has optimal body weight there will be a 25% decrease in the incidence of CHD and a stroke / cerebrovascuIar accident (CVA) of 3.5%. Weight loss is expected to reduce blood pressure, improve insulin sensitivity, burn glucose and reduce dyslipidemia. The goal is to reduce calorie intake and increase physical activity. Besides giving a list of food compositions, patients are also expected to consult with nutritionists regularly.[8]

The Relationship Between Compliance With Medication With Recurrence of Coronary Heart Disease

Based on the results of table 6, almost all respondents experienced recurrence of CHD. Respondents who both comply with the treatment and did not comply with the treatment had a big difference between the incidence of the risk of relapse and the relapse of CHD. Based on Chi square test results, it is known that the Sig.Pearson Chi-Square value is 0.033 which is smaller than the error tolerance value (α) = 5%. So it was concluded that the variable adherence to taking medication had a significant effect on the risk of CHD recurrence.

Recurrence of coronary heart disease and being treated again at the hospital occurs because patients do not fulfill the recommended therapy and treatment therapy is not appropriate. Compliance with medical therapy must be implanted in patients with coronary heart disease. Non-

compliance increases hospital mortality, morbidity and care.[9]

The results of this study are in line with previous study of factors related to the incidence of re-hospitalization in CHD patients at Arifin Achmad Pekanbaru Hospital, resulting in a correlation between treatment adherence (p-value = 0.014) and hospitalization.[10]

Risk Factors Associated With Recurrence of Coronary Heart Disease

Based on four causes of recurrence of CHD, it was found that the greatest influence on the cause was diabetes mellitus (4.49), and then compliance with medication (2.08), whereas dyslipidemia (1.46) and hypertension (1.13) did not have significance results.

Diabetics suffer from CHD that is more severe, more progressive, and more complex, and more diffuse. Diabetes mellitus is associated with changes in physical pathology in the cardiovascular system. Among them can be in the form of endothelial dysfunction and vascular disorders which ultimately increases the risk of coronary artery diseases (CAD). This condition can lead to microangiopathy, heart muscle fibrosis, and abnormal heart muscle metabolism.

Diabetes mellitus, although an independent risk factor that affects CHD recurrence, is also associated with abnormalities of lipid metabolism, obesity, systemic hypertension and increased thrombogenesis (increased platelet adhesion and increased fibrinogen levels). Long-term results of coronary artery bypass grafting (CABG) are also not very good in diabetics, and diabetic patients have an increased early mortality and the risk of recurrent post-angioplasty coronary stenosis.[11]

CONCLUSIONS

It can be concluded that the risk of diabetes mellitus had a strong association with CHD recurrence.

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REFERENCES

1. Kemenkes RI. Riskesdas 2013. Jakarta: Kementerian dan Kesehatan Republik Indonesia, 2014.
2. Indrawati L. Analisis Faktor Yang Berhubungan Dengan Kemampuan Pasien PJK Melakukan Pencegahan Sekunder Faktor Risiko Di RSPAD Gatot Soebroto Jakarta. Diakses tanggal 8 Agustus 2018 dari http://lontar.ui.ac.id /file?file =digital/ 20313795-T%2031743-Analisis faktor text.pdf, 2012.
3. Hermawatirisa. *Penyakit jantung Koroner*. Jakarta: Kandas media (Imprint agromedia pustaka), 2014.
4. Soeharto I. Penyakit Jantung Koroner dan Serangan Jantung edisi kedua. Jakarta: PT Gramedia Pustaka Utama, 2004.
5. Sitorus RH. 3 Jenis Penyakit Pembunuh Utama Manusia. Bandung: Penerbit Yrama Widya, 2008.
6. Supriyono M. Faktor-Faktor Risiko Kejadian Penyakit Jantung Koroner (PJK) Pada Kelompok Usia < 45 Tahun. (Studi Kasus di RSUP Dr. Kariadi Semarang dan RS Telogorejo Semarang). Jurnal Epidemiologi, 2008.
7. Davey P. At a Glance Medicine. Jakarta: Penerbit Erlangga, 2005.
8. Norhasimah D. Faktor Risiko Penyakit Jantung Koroner. Jakarta: Widya Medika, 2010.
9. Smeltzer CS, Bare GB. Buku Ajar Keperawatan Medikal Bedah Brunner & Suddarth, Edisi, Alih Bahasa: al, W.A, Jakarta: Penerbit Buku Kedokteran EGC, 2(8): 2012.
10. Fatoni. Faktor-Faktor yang Berhubungan dengan Kejadian Rawat inap Ulang pada Pasien PJK di RSUD Arifin Achmad Pekanbaru. http://www.fatoni.Online.com (diakses pada tanggal 10 September 2018), 2012.
11. Karikaturijo. Penyakit Jantung Koroner. Universitas Pembangunan Nasional Veteran. Jakarta. Hal, 2010; 11.