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RESEARCH ARTICLE

COMPARISON OF POSTOPERATIVE MORBIDITY AND MORTALITY BETWEEN PATIENTS WITH OR WITHOUT METABOLIC SYNDROME WHO UNDERWENT CORONARY ARTERY BYPASS GRAFTING (CABG) AT HAJI ADAM MALIK GENERAL HOSPITAL MEDAN

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ABSTRACT

Background: Diabetes Mellitus and obesity are increasing in the population undergoing Coronary Artery Bypass Graft, and these conditions are major factors in the development of Metabolic Syndrome. Metabolic syndrome is a group of factors that associated with an increased cardiovascular risk. The purpose of this study was to determine postoperative morbidity and mortality in patients with metabolic syndrome compared to patients with metabolic syndrome who undrewent Coronary Artery Bypass Grafting (CABG) surgery at H. Adam Malik General Hospital Medan. **Patients and Methods**: This study is an analytical study with a cross-sectional design, by taking secondary data from the medical records of patients who underwent CABG at H. Adam Malik General Hospital Medan, with total of 74 patients. Analysis of the data was using the Chi-Square test, which must be obtained p <0.05, the difference is statistically significant. **Results**: From 74 patients, we found statistically significant difference (p <0.05) on duration of intubation, and post-CABG surgery wound infection, there were longer postoperative CABG stay and intubation in the patient groupwith the metabolic syndrome and higher number of patient with post surgery wound infection in the group of patients with the metabolic syndrome compared to the group without the metabolic syndrome. **Conclusion**: Duration of stay, duration of intubation, and minimalizing of surgical wound infection, especially in patients with metabolic syndrome contributed in postoperative morbidity of CABGsurgery.

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INTRODUCTION

Metabolic syndrome is a complex metabolic disorder promoted by insulin resistance, central obesity, hypertriglyceridemia, decreased high-density lipoprotein cholesterol, hypertension and glucose intolerance. (Ozkan, 2017) The criteria for patients with metabolic syndrome measure 3 of the 5 following criteria are the following criteria: abdomen (body mass index>25 kg/m2); glucose intolerance (fasting glucose level>100 mg/dL); hypertension, systolic>130 mmHg and/or diastolic> 85 mmHg; hypertriglyceridemia,>150 mg/dL; or high-density lipoprotein cholesterol <40 mg/dL in men or <50 mg/dL in women. (Ozkan, 2017). Diabetes Mellitus (DM) patients was found increased in the population underwent Coronary Artery Bypass Grafting (CABG), and these conditions are major factors in the development of Metabolic Syndrome (MS). The metabolic syndrome is a group of factors associated with an increased cardiovascular risk. (Chen, 2019). Low-grade inflammatory processes act as the underlying pathophysiology by manifesting increased levels of inflammatory cytokines in the blood circulation, suggesting that MS can have detrimental effects on coronary interventions, including CABG. The prevalence of MS has been reported to be approximately 35 - 40% in industrialized countries. (Ozkan, 2017). The prevalence of metabolic syndrome varies from 16% in black men to 37% in Hispanic women. (Harrison, 2014 and Silbernagl, 2012) In Indonesia, there is no health service center that examines the effect of metabolic syndrome on postoperative outcome in patients who have undergone CABG. The aim of this study was to determine postoperative morbidity and mortality in patients with metabolic syndrome compared to patients with metabolic syndrome who had undergone Coronary Artery Bypass Grafting surgery at H. Adam Malik General Hospital Medan.

METHODS

This study is an analytical study with a cross-sectional design, by taking secondary data from the medical records of patients who have underwent CABG at H.

Adam Malik General Hospital Medan. The research was conducted at the Division of Thoracic, Cardiac and Vascular Surgery, Department of Surgery, Faculty of Medicine, University of North Sumatra / RSUP H. Adam Malik Medan. The research was conducted since the research proposal was approved by the Ethics Committee of the FK USU. The study sample was 74 patients who underwent Coronary Artery Bypass Grafting (CABG) surgery at RSUP H. Adam Malik Medan from January 2018 to December 2019, totaling 74 samples that met the inclusion criteria, namely patients who underwent the Coronary Artery Bypass Grafting (CABG) procedure at RSUP H Adam Malik Medan and patients who underwent CABG with an indication of Coronary Artery Disease 3-Vessel Disease (CAD 3VD) and the exclusion criteria were postoperative CABG patients at RSUP H. Adam Malik Medan who returned at their own request, patients who had an Ejection Fraction (EF) <30%, patients who underwent surgery in an emergency as well as patients who did not participate in the study. Analysis of the data in this study using the Chi-Square test, which must be obtained p <0.05, the difference is statistically significant.

RESULTS

Demographic characteristics of the total sample in this study, it was found that the mean age was 54.55 (41.00-69.00) years, whereas many as 65 people (87.8%) were men, compared to 9 people (12.2%).) is a girl. In a study of age and the incidence of metabolic syndrome, the median age of patients with metabolic syndrome was 51 years with a minimum and maximum age range of 41-69 years, while the median age of a sample without metabolic syndrome was 57 years with a minimum age range and a maximum of 52-67 years. Obtained p-value <0.001 which shows the statistics shown in table 1.

Characteristics and Incidence of Metabolic Syndrome: In table 2, which shows the characteristics of sex and the incidence of metabolic syndrome, 33 people with metabolic syndrome were found to be male, and 7 people with the female gender. In patients without metabolic syndrome, 32 people were male and 2 were female. Obtained p-value = 0.128 which is not significantly related statistically.

Table 3 shows that there is a statistically significant difference between patients with metabolic syndrome and patients without metabolic syndrome post CABG associated with length of stay (p-value <0.05). Regarding the differences between patients with metabolic syndrome and non-metabolic syndrome in the length of intubation, Table 4 shows that there is a statistically significant difference between patients with metabolic syndrome and patients without metabolic syndrome post CABG associated with intubation time (p-value <0.05).

Whereas table 5 shows the difference between metabolic syndrome and non-metabolic syndrome patients in surgical wound infection, which also shows that there is a statistically significant difference between patients with metabolic syndrome and patients without metabolic syndrome post CABG associated with surgical wound infection (p-value < 0.05).

In analyzing the differences between patients with metabolic syndrome and non-metabolic syndrome in perioperative mortality, it was shown that there was a statistically insignificant difference between patients with metabolic syndrome and patients without metabolic syndrome post CABG associated with perioperative mortality (p-value = 0.077).

Table 1. Age Characteristics and Incidence of Metabolic Syndrome

	Age(years)		p-value
	Mean ± SD	Median (min-max)	
Metabolic syndrome patients (n=40)	54,55 ± 8,14	51,00 (41-69)	*<0,0001
Non metabolic syndrome patients (n=34)	55,5 ± 8,44	57,00 (52-67)	

Table 2. Characteristics of Gender and Metabolic Syndrome

Gender		Metabolic syndrome		Total	p-value
		(+)	(-)		
	Male	33	32	65	0,128
	Female	7	2	9	
Total		40	34	74	

Table 3. Metabolic Syndrome and Duration of Stay

Metabolic Syndrome	Duration of stay (days) Mean±SD	p-value
(+)	9,44±1,501	0,027
(-)	7,31±1,132	

Table 4. Metabolic Syndrome and Duration of Intubation

Metabolic syndrome	Duration of intubation (days) Mean±SD	p-value
(+)	2,62 ± 0,590	<0,0001
(-)	1,40 ± 0,497	

*Statistical test using independent T test, p value <0.05 indicates statistically significant results.

Table 5. Metabolic Syndrome and Surgical Wound Infections

Metabolic syndrome	Surgical wound infections		Total	p-value
	(+)	(-)		
(+)	8	31	39	0,025
(-)	1	34	35	
Total	9	65	74	

*Statistical test using the chi-square test, p value <0.05 indicates significant results.

Table 6. Metabolic Syndrome and Perioperative Mortality

Metabolic syndrome	Peri operative mortality		Total	p-value
	(+)	(-)		
(+)	6	33	39	0,077
(-)	1	34	35	
Total	7	67	74	

DISCUSSION

In another study by Wang et al (2018), subjects were divided into three groups: control, metabolic syndrome of three factors together with diabetes, and metabolic syndrome of three factors together without diabetes. There were no criteria for truth between groups in postoperative hospital complications, epinephrine use, atrial fibrillation stroke, renal failure, coma, myocardial infarction, and recurrent revascularization. Patients in the metabolic syndrome group with diabetes, metabolic syndrome without diabetes and the control group, respectively, showed differences in the major adverse cerebral cardiovascular events (30.3% vs. 21.2%, 16.7%, P = 0.0071) and mortality (11.8% vs. 2.7%, 3.11%, P = 0.0003). Brackbill et al. (2009) also compared the clinical outcome between patients with MS (n = 333 people) and without MS (n = 324). As a result, patients with MS experienced significantly more prolonged ICU stay and postoperative hospitalization than patients without MS. Postoperative ICU care was obtained in the MS group with a mean of 2.8+ 4.3 days, and in the non-MS group with a mean of 1.9+ 2.8 days (p = 0.003). Meanwhile, for hospitalization in the MS group, it was obtained an average of 8.3+ 7.8 days and in the group without BC, an average of 6.6+ 6.0 days (p = 0.003).

In another study by Kajimoto DKK (2009), it was found that the incidence of stroke and acute kidney failure was higher in the group of patients with MS (551 people / 46.6%) compared to the group of patients without MS (632 / 53.4%). Postoperative stroke occurred in 4.7% of patients with MS and in 2.1% of patients without MS (p <0.0001). Postoperative renal failure occurred in 3.8% of patients with MS and in 1.1% of patients without MS (p = 0.008). This is consistent with the results of the study, based on the incidence of metabolic syndrome that can occur post-CABG surgical wound infection, found a statistically significant difference between patients with metabolic syndrome compared to those without metabolic syndrome post-CABG. A study by Echahidi et al (2007), found that operating mortality was higher (p <0.0001) in patients with MS (2.4%) working those without MS (0.9%). When unbeaten with age, MS was associated with a 2.8-fold increase in the risk of mortality. This is consistent with the results of the study, which was based on the incidence of metabolic syndrome managed with post-CABG mortality, it was found that there was a difference between patients with metabolic syndrome compared with post-CABG metabolic syndrome, but it was not statistically significant (p-value = P 0.077). One of the weaknesses of this study is the MSaller number of samples compared to previous studies.

In addition, all of the comparators of this study come from abroad, so it is not possible to see the effect of post-CABG metabolic syndrome nationally. From another point of view, this study can develop other studies that are consistent in order to assess the results achieved more closely, and be useful in the prevention of post-CABG morbidity.

Conclusion

Significant differences between patients with metabolic syndrome and without metabolic syndrome with a length of stay intubation, and post-CABG surgical wound infection, which means the longer length of stay and postoperative CABG intubation in the metabolic syndrome group of patients compared to the group without metabolic syndrome, and the number of patients who had more surgical wound infections in the group of patients with the metabolic syndrome than the group without the metabolic syndrome.

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