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CORRELATION BETWEEN CORONARY HEART DISEASE (CHD) AND PERIPHERAL ARTERY DISEASE (PAD)

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ABSTRACT

Background: Peripheral Artery Disease (PAP) is a disease of the blood vessels. Peripheral Artery Disease (PAP) occurs due to the formation of atherosclerosis which causes the reduction of blood flow to the extremities. Peripheral arterial disease (PAP) is also common in patients with coronary heart disease (CHD) because in patients with coronary heart disease (PJK) has a pathophysiology of atherosclerosis similar to atherosclerosis occurring in peripheral artery disease (PAP).
Aims: This study aims to determine the relationship between Coronary Heart Disease (CHD) with Peripheral Artery Disease (PAP) at Sultan Agung Islamic Hospital.
Methods: The study was an analytic observational study with cross sectional design and was conducted at Sultan Agung Semarang Islamic Hospital in November-December 2014. Diagnosis of Peripheral Artery Disease (PAP) was known by using primary data that was by measuring Ankle Brachial Index (ABI).
Results: The results showed that 42% of patients with Coronary Artery Disease (CHD) had Peripheral Artery Disease (PAP) and 10% of patients with Coronary Artery Disease (PAP) did not have Peripheral Artery Disease (PAP). Forty pecent of Non-Coronary Heart patients did not have Arterial Disease Peripheral (PAP), and 8% of patients with Non Coronary Heart Disease Peripheral Artery (PAP)
Conclusion: This study showed that patient with Coronary Heart Disease (CHD) most likely will develop Peripheral Artery Disease (PAD)

Keywords: Heart disease, Coronary Heart Disease, Peripheral Artery Disease

INTRODUCTION

Heart disease is the number one cause of death in the world. As many as 60% of all causes of death in the world due to heart disease is ischemic heart disease. At least 30% of deaths worldwide are caused by heart disease.[1] By 2030 it is estimated that 23.6 million people will die due to cardiovascular disease.[1]Coronary Heart Disease (CHD) is thought to be closely related to the occurrence of Peripheral Artery Disease (PAP). Both are caused by atherosclerosis, but current research on the relationship of Coronary Heart Disease (CHD) with Peripheral Artery Disease (PAP) has not widely conducted.[2]Based on doctor's diagnosis, the prevalence of coronary heart disease in Indonesia in 2013 is 0,5% or estimated about 883,447 people, while based on doctor / symptom diagnosis 1.5% or estimated about 2,650,340 people.[3] Central Java is the third highest of prevalence of coronary heart disease (120,447).[3]

Based on preliminary survey data at Sultan Agung Islamic Hospital, patients with Coronary Heart Disease (CHD) up to 30% of all inpatients and outpatients. Several studies have found a high prevalence of Coronary Heart Disease (CHD) in Peripheral Artery Disease (PAP) patients. During 5 years found the mortality rate

of patients with Peripheral Artery Disease (PAP) as much as 30%, with 75% of them died because of Coronary Heart Disease (CHD).[4]

Most of (80%) of coronary heart disease (CHD) is caused by atherosclerotic occlusion of the coronary artery. Atherosclerotic occlusion of the coronary arteries can lead to several other diseases such as cerebrovascular disease, Peripheral Artery Disease (PAP), stroke and several other diseases[5] Atherosclerotic caused by several risk factors. Risk factors for atherosclerotic in Coronary Heart Disease (CHD) are similar to risk factors of Peripheral Artery Disease (PAP). The Framingham study has proven that smoking, diabetes mellitus, age, dyslipidemia, and hypertension are proven risk factors for Peripheral Artery Disease (PAP).[4] Diabetes mellitus 42,5%, age 42,7%, dyslipidemia 92,5%, hypertension 85%, and smoking 27,5% can cause atherosclerotic.[4]

Atherosclerosis in coronary heart disease (PJK) that occurs over a long period of time can cause thrombus and cause embolism. Macro and micro embolism that will cause atherosclerosis in the arteries in the periphery or called Peripheral Artery Disease (PAP).[6]Peripheral Artery Disease (PAP) 47.3% occurs at the age above 40 years.[7] One method to make a diagnosis of Peripheral Artery Disease (PAP) is by measuring ABI (Ankle Brachial Index). ABI results is normal if in 1.0 to 1.3, but ABI less than 0.9 are abnormal and have a risk of Peripheral Artery Disease (PAP).[8]

Based on the description above needs to be proven by research to determine whether there is a relationship between atherosclerosis that occurs in the coronary artery with atherosclerosis in the peripheral artery. The study was conducted at Sultan Agung Moslem Hospital. There were many patients of Coronary Heart Disease (PJK) in the Polyclinic of Disease of Sultan Agung Hospital, both inpatient and outpatient which all data were recorded in medical record. This result conducted to prove there is a relationship between Coronary Heart Disease (CHD) andtehadap incident Peripheral Artery Disease (PAP). Seeing that in Indonesia cardiovascular disease is still likely to be the first cause of death, the incidence of cardiovascular disease is also still found in some inpatients and outpatients.

METHODS

This research is observational analytic research with cross sectional design. The population in this study were all inpatients and outpatients in the Polyclinic of Internal Medicine of Sultan Agung Islamic Hospital Semarang in November-December 2014 (50 patients). The sampling technique is consecutive sampling. The research instrument comes from secondary data that is medical record data.

The sample size was 50 patients, 50 patients were divided into two groups. The first group with 25 patients with diagnosis of Coronary Heart Disease (CHD) and second group of 25 patients with diagnosis of Non Coronary Heart Disease.

Research begins with the provision of informed consent, to explain the intent and purpose of research to the sample by requesting a sample's approval signature. Researcher observed the measurement of blood pressure and the value of ABI (Ankle Brachial Index) that was conducted by health practitioner in the hospital. ABI (Ankle Brachial Index) measurements were obtained from a comparison of systolic blood pressure of the dorsal artery of the pedis and the posterior tibial artery in the lower limb with a brachial artery.

The collected data were analyzed using computerized system with SPSS 20 program using statistical analysis. After the data is processed, then did tabulation of data in data analysis by using Chi-square test with the help of computer program SPSS Windows 20 followed by Contingency Coefficient analysis to determine the closeness of the relationship between independent and dependent variables.

RESULT

Table 1. Cross-tabulation of patients with Coronary Heart Disease (CHD) with Peripheral Artery Disease

		PAP		
		+	-	**Total**
PJK	+	21 (42%)	5 (10%)	26 (16%)
	-	4 (8%)	20 (40%)	24 (48%)
Total		25 (50%)	25 (50%)	50 (100%)

Hypothesis is obtained by performing chi square test (X2) with p result 0.000 (p <0,05) so that null hypothesis is rejected and simple hypothesis accepted. This means that patients with diagnosis of Coronary Heart Disease (CHD) has a significant correlation with the occurrence of Peripheral Artery Disease (PAP).

DISCUSSION

The results showed that patients with Peripheral Artery Disease (PAP) were found in patients with a diagnosis of Coronary Heart Disease (CHD). Chi square test results (X2) also showed a significant relationship between Coronary Heart Disease (CHD) with Peripheral Artery Disease (PAP). This is supported by the results of research Leong[3] in Kuala Lumpur which states that the prevalence of Coronary Artery Disease (PJK) in Peripheral Arterial Disease (PAP) is high at 45.1% of patients with ST segment of myocardial infarction elevation and 40.2% of patients with non-segment ST elevation of myocardial infarction and 14,7% Patients with angina pectoris were unstable in 102 total patients in the study.

Research on the correlation between Coronary Heart Disease (CHD) and Peripheral Artery Disease (PAP) has not been widely conducted in Indonesia, several studies have been conducted abroad showing there is a correlation between Coronary Heart Disease (PFS) and Peripheral Artery Disease (PAP). Research Serge et al in France showed that of 1340 patients that diagnosed Coronary Heart Disease (CHD) 21.3% had Peripheral Artery Disease (PAP). Diagnosis of Peripheral Artery Disease (PAP) is conducted by measuring ABI (Ankle Brachial Index) with result <0.90.[9] Research conducted by Mark et al in Canada, showed that of 28,649 male patients over the age of 40 that diagnosed coronary heart disease (CHD) 2,509 patients had Peripheral Artery Disease (PAP). Patients with Coronary Heart Disease (CHD) with Peripheral Artery Disease (PAP) have a high mortality.[10]

This study showed that patients that diagnosed Coronary Heart Disease (CHD), 42% of them have Peripheral Artery Disease (PAP). This does not rule out the possibility that many other risk factors that accompany, such as the history of smoking, lipid levels, diabetes mellitus, hypertension that all three can not be controlled and exclusion simultaneously.

Peripheral Artery Disease (PAP) generally occurs due to the atherosclerosis of the blood vessels. This disease usually occurs at the age above 40 years. Atherosclerosis that occurs in the coronary arteries as a cause of Coronary Heart Disease (CHD) occurs due to several risk factors of Coronary Heart Disease (CHD) such as diabetes mellitus, hypertension, lipid levels, and smoking where it can cause endothelial vascular damage in the heart. Diabetes mellitus becomes the most important risk factor of Coronary Heart Disease (CHD), microangiopathy is common in coronary arteries and peripheral arteries in which it is characterized by the occurrence of atherosclerosis. Arterial endothelial cell layer is the most biologically active organ, because its ability to produce vasodilators known as endothelium derived relaxing factors (EDRF) or commonly known as Nitric Oxide (NO).

Patients with Coronary Heart Disease (CHD) as well as Peripheral Artery Disease (PAP) patients show a lesion in the vascular endothelium. The most important cause is a disturbance in the bioavailability of Nitric Oxide (NO). Nitric Oxide (NO) is the most important stimulus of vasodilation and plays a role in reducing

inflammation through the modulation of leukocyte and blood vessel interactions and further Nitric Oxide (NO) limits the migration and proliferation of vascular smooth muscle cells (VSMC) and limits the activation of cells blood vessel. This is why the loss of Nitric Oxide (NO) will disrupt the blood vessels that will cause atherosclerosis.[11]

The explanation of atherosclerosis occurring in Coronary Heart Disease (CHD) is strongly suspected to affect atherosclerosis in Peripheral Artery Disease (PAP) due to the same pathophysiology of atherosclerotic.[9]

CONCLUSION

Based on the results of the study "Correlation Between Coronary Heart Disease (CHD) and Peripheral Artery Disease (PAP)" a cross sectional study in patients with Coronary Heart Disease (CHD) at Sultan Agung Islamic Hospital Semarang, it can be concluded as follows : patients with Peripheral Artery Disease (PAP) has over 40 years old, of all samples of 100% of patients of male sex and has a history of Coronary Heart Disease (CHD). The level of closeness of the relationship between Coronary Heart Disease (CHD) with Peripheral Artery Disease (PAP), indicates the intermediate relationship between the two.

In the subsequent study, needs a larger number of samples and sufficient for randomized sampling, the design better using case control or cohorts, and ankle brachial index (ABI) determination for PAP patients (Arterial Disease Peripheral) by using more accurate tools such as doppler ultrasound. In addition, for health workers or hospitals is about the need for more comprehensive treatment management for patients with Coronary Heart Disease (CHD) with attention to the possibility of the emergence of the risk of Peripheral Artery Disease (PAP) in these patients.

REFERENCES

1. Organization WH. World Health Organization Report 2010. Genewa: WHO; 2011.
2. Dieter RS. C, WW., Pacanowski,JP., McBride,PE., Tanke TE. The Significance of Lower Extremity Peeripheral arterial Disease. Journal of Clin Cardiol. 2001;25:3-10.
3. RI KK. Situasi Kesehatan Jantung. Jakarta: Kementrian Kesehatan RI; 2013.
4. Leong B. ZA, FRCS., Chuah J.A., Voo SY. Prevalence of Peripheral Arterial Disease and Abdominal Aortic Aneurism Among Patienets with Acute Coronary Syndrome. Malaysia2012.
5. Munther K HM. UK: Tufts; 2008.
6. Norgren l. HW, Dormandy JA. Inter-Society Consensus for Management of Peripheral Arterial Disease (TASC II). The Society for Vascular Surgery. 2007:5-67.
7. Pande RL. PT, Beckman JA., Creager MA. Secondary prevention and mortality in peripheral artery disease: National Health and Nutrition Examination Study, 1999 to 2004. Circultion. 2011;124:17-23.
8. Rino MS. PC, P Cambou, Belliard, P Beregi, A.Branchereau, F.Luizy, E.Michi. Prevalence of Peripheral Arterial Disease in High Risk Patients Using Ankle-Brachial Index in General Practice. Clinical Practice International Journal. 2012.
9. Serge K. PC, Cacoub P., Leger P., Luizy F., Marie A., Priollet. Prevalence of unknown peripheral arterial disease in patient with coronary arterial disease. France2009.
10. Mark J. FA, Diane P., Danielle A., William A., Merril L., Ross T. lower extremity peripheral arterial disease in individuals with coronary artery disease. 2004.
11. Murray KR. GD, Rodwell V. Biokimia. Jakarta: EGC; 2009.