OVERWEIGHT AND OBESITY AS SOCIATE FACTORS WITH HYPERTENSION IN MALANG, EAST JAVA

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ABSTRACT

Background: Overweight and obesity are global health problem, with increased cardiovascular risk, a major contributor to the global burden of disease financing. Obesity causes expansion of extracellular fluid volume and increased blood flow to tissues which can increase venous return and cardiac output, causing hypertension. Obese adolescents throughout their life have a higher risk of suffering from a number of serious health problems such as diabetes, heart disease and stroke. Hypertension in obesity tends to be more difficult to control so that it requires anti-hypertensive medication therapy. This study aimed to analyze the risk factors of hypertension among obese and overweight adolescent in Malang, East Java.
Subjects and Method: A cross sectional study was conducted in Malang, East Java, Indonesia. A total of 60 respondents was selected for this study. The dependent variable was hypertension. The independent variables were obesity/overweight, family history of hypertension, and family history of obesity. The data of obesity were collected using body mass index (BMI) and hypertension by blood pressure. Data were analyzed using logistic regression.
Results: Obesity/overweight increased the risk of hypertension (OR = 5.8; p< 0.001) and it was statistically significant. The obesity, family history of hypertension, and family history of obesity, were simultaneously associated with the risk of hypertension among adolescent.
Conclusion: The obesity/overweight, family history of hypertension, and family history of obesity, are simultaneously associated with the risk of hypertension among adolescent.

Keywords: overweight, obesity, hypertension, adolescents

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BACKGROUND

Obesity in childhood and adolescence is linked to cardiovascular disease risk factors and speeds up the atherosclerotic process, such as high blood pressure, atherogenic dyslipidemia, atherosclerosis, and metabolic syndrome. Adiposity increases the cardiovascular risk clustering during childhood and adolescence (Raj, 2012).

Obesity is a growing global health problem, with increased cardiovascular risk and early cardiovascular morbidity thus increasing the burden of health costs, hypertension is a major contributor to the global burden of disease, both direct and indirect financing for hypertension care (Leggio, 2017).

The prevalence of obesity in 2013 in the world amounted to 2.1 billion. In Indonesia, Basic Health Research in 2013 shows that the prevalence of obesity for adolescents aged 16-18 years is 7.3% consisting of 5.7% overweight and 1.6% obesity. The trend of obesity prevalence increased from 1.4% (in 2010) to 7.3% (in 2013). The province with the highest obesity prevalence is DKI Jakarta (4.2%), while East Java is included in the 7th place in Indonesia where the obesity prevalence rate exceeds the national rate of 1.6% while in East Java is 2%.

The prevalence of obesity in urban areas is higher than in rural areas, namely 1.8% in cities and 0.9% in rural areas

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(Ministry of Health, 2013). Obese adolescents throughout their life have a higher risk of suffering from a number of serious health problems such as diabetes, heart disease and stroke. Obesity causes injury to vital organs such as kidneys. Hypertension in obesity tends to be more difficult to control so that it requires anti-hypertensive treatment therapy. Obesity causes expansion of extracellular fluid volume and increased blood flow to tissues which can increase venous return and cardiac output, causing hypertension (Hall, 2015). Malang City Health Profile in 2014 shows a prevalence of 3,099 people who experience obesity with an age range above 15 years, and as many as 2,315 people who suffer from hypertension. This study aimed to analyze the risk factors of hypertension among obese and overweight adolescent in Malang, East Java.

SUBJECTS AND METHOD

1. Study Design

This was a cross-sectional study conducted in Malang, East Java, Indonesia, from July to September 2020.

2. Population and Sample

The study population was all adolescents who were obese Malang city. A total of 60 obese adolescent were involved in this study.

3. Study Variables

The independent variable in this study was body mass index (BMI). The dependent variables in this study were blood pressure, family history of hypertension, and family history of obesity.

4. Study Instruments

Data collection in this study was carried out with a survey using a questionnaire sheet with a door-to-door system.

5. Data Analysis

The data obtained were analyzed using bivariate analysis with error score was 5%.

RESULTS

The characteristic of total of 50 study subjects was showed in Table 1.

Table 1. Characteristics of Study Subjects

Characteristic	Category	n	%
Nutritional Status	Normal	16	26.70%
	Obese	44	73.30%
Blood Pressure	Normal	27	45%
	Prehypertension	33	55%
History of Hypertension	Had no history	24	40%
	Had history	36	60%
History of Obesity	Had no history	21	35%
	Had history	39	65 %

2. Bivariate Analysis

Table 2. The study results

Category	p
BMI	0.004
Family History of Hypertension	0.533
Family History of Obesity	0.408
All variables	0.040

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The results of the analysis above indicate that BMI had a relationship with hypertension in obese adolescents, whereas family history of hypertension and family history of obesity did not have a relationship with adolescent hypertension. Meanwhile, the three-variable discriminant test on hypertension shows that the three variables have a significant effect on adolescent hypertension.

DISCUSSION

The results showed that there was a correlation between BMI and blood pressure in obese adolescents with a significance value of 0.004, where adolescents with a range of age 14-18 years had 55% pre-hypertension, this indicates that at a young age there is a greater risk of hypertension in adulthood. This study is in accordance with the results of Suglia's study, 2013 which conducted a study in the adolescent and adult age group who were overweight, where a higher risk of hypertension was noted for all genders and races as well as those who were overweight / obese had more hypertension risk high.

Another study from Cheung, 2017 states that obesity is a risk factor for premature hypertension. Another supporting study was put forward by Sorof (2002) which states that obese children have a risk of hypertension about 3 times higher than children who are not obese. Sorof conducted a study on school children to distinguish the heart rate of adolescents with obesity and those with normal weight, obtained results obese children have a faster resting heart rate than those of normal body weight.

The three-variable discriminant test on blood pressure shows that the three variables have a significant effect on adolescent blood pressure with a significant value of 0.040. Adolescents with obesity, family history of hypertension, and cannot maintain a healthy lifestyle increase the risk of developing prehypertension at a young age and continues. in adulthood will increase. Another study also states that the prevalence of prehypertension and hypertension in adolescents increases in line with the increasing prevalence of obesity. Some researchers say there is a strong correlation with the increase in BMI and cases of hypertension, this is related to modifiable and non-modifiable factors (Kelly, 2015).

The results of this study reported that 60% of study subjects had families with hypertension. The risk factor for hypertension that cannot be modified is genetics, where the results of the study of the Surveillance of Non-Communicable Diseases in Purworejo District, Central Java stated that 25% of respondents who suffer from hypertension carry a genetic risk, genetic risk carriers have a risk of developing hypertension by 1.36 times compared to not carrying it. genetic risk (Ministry of Health, 2007).

Dickson (2006) states that essential hypertension is the cause of 90% of hypertension cases and the number 13 cause of death in America, genetics has a strong risk factor for the occurrence of essential hypertension. Family history with hypertension not only in parents but also grandparents who occur before the age of 55 years will increase the risk of reducing hypertension to the family (Patel, 2017).

In addition to a family history of hypertension, a family history of obesity also has an influence on the incidence of hypertension in adolescents where adolescents with genetic obesity will increase the risk of obesity apart from genetics, it is also obtained from family consumption patterns. These results are in accordance with study from Febriani (2018), which states that genetics has a direct risk factor for adolescents with over nutritional

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status. Leptin or metabolic hormone dysregulation affects the occurrence of obesity, which in this case can be the same as family members because they have the same chromosome, families with obesity can be passed on to the next generation, if one parent is obese then has a 40% risk, if both parents having obesity eating children has an 80% risk of becoming obese (Salam, 2010; Rhee, 2012). Even so, a family history of obesity and hypertension is a risk factor that can be modified by maintaining a healthy lifestyle and regulating nutritional intake, this is in accordance with research from Febriani, (2018) and Suyanto (2015) which states that diet has a positive impact on losing weight consistently. adopting a healthy diet and in accordance with the condition of the body, adjusting a diet that consumes too much fat, carbohydrates affect weight gain.

Family history and genetic variables were obtained only based on the respondent's knowledge, so the potential for invalid data was greater. BMI has a significant effect on blood pressure which shows the results of prehypertension in adolescents, the risk will increase when obese adolescents have a family history of obesity and hypertension.

Maintaining a healthy lifestyle by regulating a balanced consumption pattern and controlling body weight is an implementation that must be done by adolescent in order to reduce risk factors for hypertension or complications due to obesity as an adult. The role of families in changing healthier lifestyles and collaboration with the health office are important to carry out regular health screening for adolescents, especially adolescents with obesity.

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