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Prevalence of Metabolic Syndrome among the Elderly in the Work Area Health Center of Langsa Barat

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Abstract: ***Background: Metabolic syndrome is a cluster of conditions which includes increased waist circumference, increased blood triglyceride levels, decreased levels of high density lipoprotein (HDL) cholesterol, high blood pressure, and glucose intolerance. The World Health Organization (WHO) states that any individual having at least three of these five conditions can be declared to be suffering from metabolic syndrome. Increasing life expectancy affects the style of the elderly to live in a healthier and more productive life. Objective: To identify the potential prevalence of metabolic syndrome in the elderly group in the West Langsa Community Health Center working area. Method: This study was a cross sectional study with a descriptive approach. The sample of this study included 30 elderly patients who visited the West Langsa Health Center in May 2018. Results: Based on the diagnosis criteria of the NCEP ATP II, 53% of the elderly suffered from metabolic syndrome. Conclusion: There is still a high proportion of the elderly with metabolic syndrome, and thus, more intense attention and supervision within the elderly groups are needed.***

Keywords: Metabolic Syndrome, Elderly

1. Introduction

Metabolic syndrome is a cluster of conditions which includes increased waist circumference, increased blood triglyceride levels, decreased levels of high density lipoprotein (HDL) cholesterol, high blood pressure, and glucose intolerance. The World Health Organization (WHO) states that any individual having at least three of these five conditions can be declared to be suffering from metabolic syndrome.[1] The National Cholesterol Education Program (NCEP) modified for the Asian region identifies that metabolic syndrome is present in an individual with three of five conditions, including waist circumference (>90 cm for men or >80 cm for women), triglyceride level (>150 mg/dl), high density lipoprotein (HDL) cholesterol (<45 mg/dl for men or <50 mg/dl for women), blood pressure (>130/85 mmHg), and fasting blood sugar (>110 mg/dl).[2]

The prevalence of metabolic syndrome in the adult population was estimated to be at 15% in Europe, at 14.2% in South Korea, and at 24% in the United States. Indonesia, in this case, had a proportion of 23.34% of the total population suffering from metabolic syndrome (26.2% men and 21.4% women).[2] Genetics is believed to play a 50% role in the emergence of metabolic syndrome, while obesity causes a risk for people with chronic diseases, such as diabetes mellitus, hypertension, coronary heart disease, cancer, and can also shorten life expectancy. Obesity is also influenced by the lifestyle that rarely involves intense physical activity which can burn calories in the body. When excessive calorie intake is imbalanced with the physical activity, it will be easier for an individual to become fat.[3]

The general Asian, including Indonesian, populations have smaller body shapes than the Caucasian population. This will put the Asian people at a higher risk of abdominal obesity; having a smaller body mass index (BMI) with a higher LiPi. Other risk factors of metabolic syndrome include psychosocial stress through the mechanism of the hypothalamic hormone balance disorder-pituitary-adrenal axis (HPAaxis). Increased fat in the visceral area in central obese patients will elevate the risk of insulin resistance. Inadequate physical activity and excessive calorie intake are also risk factors for metabolic syndrome. Individuals with low physical activity are at risk of suffering from metabolic syndrome twice greater than those with adequate physical activity.[6] Research in Canada found that the odds ratio (OR) of having good physical activity for the metabolic syndrome was 0.73 (95% CI = 0.54-0.98; *p*-value<0.05) compared to that of poor physical activity. Another study in the United Kingdom showed that moderate and high physical activities reduced the risk of getting the metabolic syndrome with the OR for moderate physical activity of 0.78 (95% CI = 0.63; 0.96) and for high activity of 0.52 (95 % CI = 0.40; 0.67).[7] The increase in the population of the elderly will have an impact on various aspects of life. The major impact is the high dependence of the elderly, largely caused by the physical, psychological, and social deterioration of the elderly. This dependence can be described through four stages: weaknesses, functional limitations, incompetence, and inhibition, which will be experienced along with the body decline due to the aging process. The aging process is a reasonable and inevitable phase of life. However, this process still causes problems either physically, biologically, mentally, or socio-economically. The issues that arises due to various changes in the elderly, if not resolved properly, tend to completely affect their health. The elderly will slowly and progressively lose resistance to infection and undergo many degenerative diseases such as hypertension, arteriosclerosis, diabetes mellitus, and cancer. The other diseases also include stroke, myocardial infarction, acidotic coma, and metastatic cancer, among others.

2. Methods

This study was a cross sectional study with a descriptive approach to identify the prevalence of metabolic syndrome in the work area of West Langsa Community Health Center

(Puskesmas). The subjects of the study were selected from the elderly patients who visited the Health Center, with a total of 30 people. They were given an informed consent prior to the study, which took place for two weeks in May 2018. The elderly were checked based on the age category.

Table 4.1: The characteristics of research subjects in the area of West Langsa Puskesmas (n=30)

Subject characteristics	Frequency	Percentage (%)
Age (years)		
Early elderly (46-55)	15	50
Late elderly (56-65)	11	37
Senior (> 65)	4	13
Gender		
Male	13	43
Female	17	57
Latest Education		
Elementary school	7	23
Junior high school	4	13
Senior high school	8	27
Undergraduate	11	37
Occupation		
Housewife	7	23
Civil servant	11	37
Entrepreneur	9	30
Retired	2	7
Farmers/fishermen	1	3
Ethnicity		
Acehnese	25	83
Javanese	3	10
Bataknese	2	7

3. Results

Of 30 subjects, the early elderly took the highest number with 15 people (50%). The youngest was 46 years old, while the oldest was 80 years old. The biggest proportion in terms of gender was female at 57% (17 people). The subjects were mostly Bachelor's degree holders with 11 people (37%). Also, the elderly were mostly civil servants with 11 people (37%). The largest percentage for ethnicity was 83% (25 people) coming from the Acehnese.

Table 4.2: The distribution of metabolic syndrome criteria

No	Examination	Criteria Value	Frequency (f)	Percentage (%)
1	Blood sugar level (random)	< 160 mg/dL	21	70
		> 160 mg/dL	9	30
2	Triglyceride level	< 150 mg/dL	24	80
		> 150 mg/dL	6	20
3	Cholesterol level	< 200 mg/dL	18	60
		> 200 mg/dL	12	40
4	Blood pressure	< 130 mmHg	7	23
		> 130 mmHg	23	77
5	Waist circumference	Men		
		< 90 cm	6	20
		> 90 cm	7	23
		Women		
		< 80 cm	2	7
		> 80 cm	15	50

Based on the criteria of the National Cholesterol Education Program (NCEP), the highest blood sugar level was in the range of >110 mg/dL with 21 people (70%), the highest level of triglycerides was at <150 mg/dL with 24 people (80%), the highest cholesterol level was at <200 mg/dL with 18 people (60%), the highest blood pressure was at >130 mmHg with 23 people (77%), and the largest waist circumference was in men with 7 people (23%) and women with 15 people (50%). Figure 1 below shows that the elderly diagnosed with metabolic syndrome were 16 people (53%).

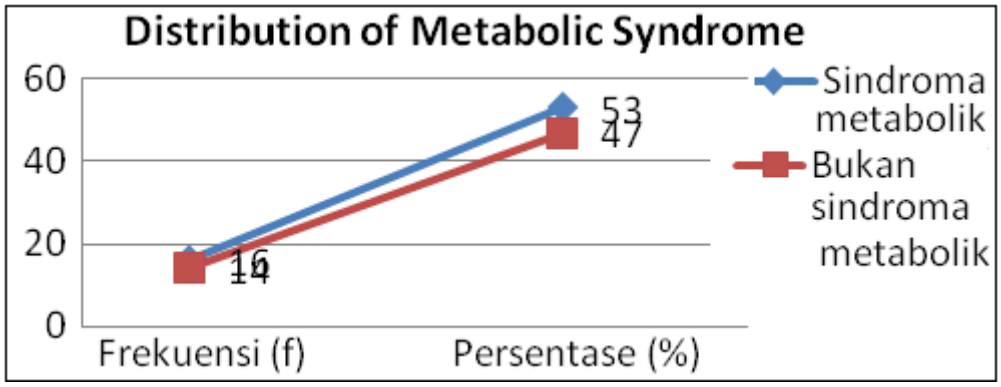

Figure 1: Distribution of metabolic syndrome patients

4. Discussions

4.1 Based on the research subjects

This study revealed that the early elderly group had the largest proportion of people with metabolic syndrome of 50%. This finding was in line with the study conducted by Pade D et al., 2011 which found that the age group of 50–69 years old mostly experienced the metabolic syndrome.[16] Similarly, the study by Sehaema, 2015 also stated that the syndrome was largely found in the age group of 40-64 years of 29.5%, and the study by the WHO reported that the age between 55-64 years had the high prevalence of the syndrome.[17]

In terms of gender, this study identified that the number of women suffering from metabolic syndrome was higher than that of men with 57%. The finding was supported by the study of Suhaema, 2015 which also revealed that women outnumbered men with 27% in the case of metabolic syndrome. On the contrary, research by Hendra K, 2107 indicated that there were more men diagnosed with the syndrome than women with 68% as well as research by the WHO in France which showed that the prevalence of metabolic syndrome was larger in men than in women.[18]

In this study, most respondents (37%) had undergraduate education which made it easy for them to adapt and accept changes of their surroundings. One's education is very likely to influence one's learning process; the higher the education, the easier it is to receive information, including the information on health services. The information can be obtained from other people or from the media; thus, the awareness in the use of health services will be much higher. Therefore, the higher the level of education is, the better the socio-economic and independence will be (Wahyunasari, 2012).[19] Education and work are interconnected in which education can help determine the type of work someone does. Further, most of the elderly in this study were civil servants, suggesting that the type of work they had required less physical movements and more indoor activities. Such working conditions would eventually contribute to generate excess fat, to elevate cholesterol, sugar blood and triglyceride levels, and to increase waist circumference. As a consequence, hypertension and obesity might be triggered.

4.2 Based on the prevalence of the metabolic syndrome of the research subjects

Of all research subjects examined, 53% (16 people) of them were found to be diagnosed with metabolic syndrome, suggesting that the prevalence of this syndrome was high among the elderly. There were three major indicators for the syndrome in this study, including sugar blood levels, blood pressure levels, and waist circumference.

This result shared a similarity with Mega's finding in 2013, which stated that 71.6% of the respondents were patients with metabolic syndrome.[20] Metabolic syndrome is a group of body function disorders which involves central obesity (obesity based on excessive waist circumference), high blood pressure (pre-hypertension or hypertension), dyslipidemia (increased cholesterol especially LDL and triglyceride, and low HDL), insulin resistance disorder, and diabetes mellitus.[21] The syndrome is a clustering of abnormalities in both lipids and non-lipids in an individual which is considered a risk factor for coronary disease (Bodhy et al.,2011)

The prevalence of metabolic syndrome varies between countries. The study by Cameron et al. reported that the prevalence of metabolic syndrome reached 15-30% which was widely occured in developing countries. Several studies on metabolic syndrome in Indonesia showed that in Makassar of 227 men aged between 21-81 years, 56.4% of them met the criteria set by the NCEP ATP III (National Cholesterol Education Program Adult Treatment Panel III), and in Semarang among 297 type 2 diabetes inpatients of Endocrinology Polyclinic of dr. Kariadi Hospital, 52.2% of them met the criteria set by the WHO and 73% met the criteria of NCEP ATP III. [22]

Metabolic syndrome, in principle, is a pre-disease condition characterized by a set of abnormalities with various clinical consequences, in which if not treated early the condition will result in various degenerative diseases, such as type 2 diabetes. This degenerative disease is indicated by high levels of blood sugar as a result of a disturbance in the body's metabolic system, in which the pancreas is unable to produce the hormone insulin to meet the body's needs. If not properly handled, this disorder can cause various chronic complications, involving macrovascular and microvascular complications. In people with diabetes mellitus, the microvascular complications include diabetic retinopathy, diabetic nephropathy, and diabetic neuropathy.

In addition, increasing central obesity will cause visceral fat to develop, leading it to behave like an endocrine organ that is able to secrete pro-inflammatory adipokine (TNFα dan IL-6) accompanied by a decrease in adiponectin adipokine anti-inflammatory. Such conditions will trigger the occurrence of oxidative stress, of which the stress will enhance the possibility to damage the DNA, cells, and tissues, and will have an impact to the development of insulin resistance and cardiovascular complications.[23]

5. Conclusion and Suggestion

The high prevalence of the elderly with metabolic syndrome requires more supervisory actions and preventive measures to avoid further complications of a new epidemic of cardiovascular diseases and other degenerative diseases that may lead to early death.

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