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THE PREVALENCE OF INCREASING TOTAL CHOLESTEROL AND BODY MASS INDEX IN ELDERLY PEOPLE AT PANTI JOMPO WERDHA TRENA IN GIANYAR BALI (PRELIMINARY STUDIES)

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ABSTRACT

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Cholesterol is a type of fat that is found in our blood, which is produced by liver. Hereby this research will be done on elderly in an old folk home called as Panti Jompo Werdha Tresna. The samples that was taken was both female and male, age varies around 60 years old to 80 years old. Blood was taken together with height and weight to make the correlation between all this two variables.The study design for this research is descriptive study. 20 blood samples have been taken. From the data that obtained in the results it is concluded that if the elderly with high body mass index (BMI) tend to have high total cholesterol. Mean serum cholesterol in the study population was 195.25 ± 32.48 mg/dL(>199 mg/dL) in 60% of the investigated men and 53.3% of the investigated women. As a conclusion, in this study found that the prevalence of excess body weight and age is not associated with the prevalence off increasing total cholesterol compare to other studies. Maybe it is because of total population that is taken in this study is very less compare to others. So the results do not really show the prevalence in population. It is advisable to do some research on the elderly with a higher number of samples so that it can represent the condition within population.

Keywords: Cholesterol, Body Mass Index, Age

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INTRODUCTION

Cholesterol can be defined as substance that can be found in all cells which have the characteristic of wax like fat-substance. Most of us do not know the importance of cholesterol in our body. Hormones and vitamin D are produced by cholesterols. Not only our body but even the food that we consume contains cholesterol.[1]Cholesterol is packed in small packages which will travel in our bloodstream. These packages contain fat in the inner surface and protein in the outer surface. These packages are called lipoproteins. Lipoproteins are divided into two categories which are low-density lipoproteins (LDL) and high-density lipoproteins (HDL). LDL is called as bad cholesterol while HDL is called as good cholesterol. The reason LDL is called bad because it will build up in the arteries whereas HDL will bring the cholesterol back to the liver so that liver can get rid of it.[2]

Cholesterol that is consumed from food that contains saturated fat can be reduced. The prevalence of elderly men and women with cholesterol increases with age. As we know age can be very important factor for cholesterol level. There are studies in US shows that if an elderly man above 45 years old and women above 55 years old have the higher risk for cholesterol. Studies also show women have better cholesterol level than men. According to the statistics shown around 71 million elderly adults between 30-35% in America have high LDL. Despite of having high LDL only 1 out of 3 adults has the condition under control. On top of that only half of it will get proper treatment. Individuals with high total cholesterol have the higher chance to suffer from heart diseases.[9]

Besides that how we correlates total cholesterol with body mass index in elderly individuals? What is ideal weight for elderly people? If we want to know the healthy weight of a community we should check the body mass index (BMI). BMI is derived from height and weight. In an elderly people it is advisable to have BMI between 25 and 27. For example if the person is older than 65 it is advisable to have BMI slightly higher to prevent osteoporosis. The correlation between BMI and blood pressure will be weaker as the age increases in both men and women. Even the correlation between BMI and total cholesterol will be weaker as the age increases after 30 years in men and after 40 years in women. Usually in men age dependent changes is more prominent. The last decade the prevalence for obesity in elderly is increasing excessively. Whereas the prevalence for excess body weight is lower among adolescents than elderly.

Exposure to obesity in early life will increase the complications during elderly such as cholesterol. Study on elderly individuals is very important to see the transition from their young adulthood in parallel to changes in their diet and activity.[4]

This study therefore designed to give recent prevalence of body mass index, as well as rose in total cholesterol level in selected elderly individuals. This study also aimed to determine the results between the body mass index and total cholesterol with other studies that have same variables.

METODE

The study design for this research is descriptive study. The research is done on both male and female subjects. 20 blood samples have been taken.Research was carried out in Panti Jompo Tresna Werdha with the help from Laboratorium Klinik Mantra Medika. The research was done from February till June.Criteria of the sample are male and female elderly population in the age of range 60-80 years old from the area of research stated above.

The minimal sample size required is 18.29, which rounded off to 19 samples. The sample selection method will be random sampling. Extra samples are taken just in case any error occurs.

The data was collected from any of the male and female individual at the range of age from 60-80 years old who have given the consent. Individual are taken randomly and their weight in kilograms and height in metres square are calculated to obtain the BMI. The value of BMI of the individual is noted and using the table above the value is compared to which category the individual belongs. It is to see whether the individual at the category normal.

Distribution of BMI and age

An important characteristic of our study population is described in table 1 in appendix. The mean age of the included 20 male and female was 69.9±6.51 years (57-80 years) and

their mean BMI was 24.08 ± 5.53 kg/cm^2. Overall BMI was <18.5 kg/cm^2 in 2 (10 %), 18.5-24.9 kg/cm^2 in 9 (45%), 25.0-29.9 kg/cm^2 in 3 (15%), 30.0-34.9 kg/cm^2 in 4 (20%), 35-40 kg/cm^2 in (10%) conscripts.

BMI and serum cholesterol
Mean serum cholesterol in the study population was 195.25 ± 32.48 mg/dL; itwas >199 mg/dL in 60% of the investigated men and >199 mg/dL in 53.3% 0f the investigated women. Serum cholesterol increased through increasing categories of BMI in table 2.

Table 1. Important characteristic of study population.

Samples	Age (years)	Body Mass Index [kg/cm^2]	Total Cholesterol
1	68	20.7	226
2	68	19.6	242
3	70	20.2	116
4	75	17.9	170
5	70	21.8	170
6	62	24.2	166
7	75	19.2	190
8	80	18.3	203
9	66	34.9	163
10	71	26.2	217
11	60	31.2	211
12	75	19.1	181
13	79	25.7	234
14	70	24.3	149
15	57	25.3	213
16	70	21.0	251
17	60	30.1	201
18	67	38.4	215
19	80	21.0	193
20	75	22.5	194

DISCUSSION
From the data that obtained in the results it is concluded that if the elderly with high BMI tend to have high total cholesterol. Overweight and obesity are very serious issues in worldwide and mostly of them are suffering from diseases like heart disease and stroke.Moreover, the data also shows that prevalence of obesity in elderly considered geographical variation. The analysis that was done referring few journals from the period of 2010 to 2014 total cholesterol does increase with excess bodyweight.[8] Of note, shows obesity is associated with increased total cholesterol but only increased in LDL not in HDL. The study population found was similar to this study which is total cholesterol is the dependent factor, age and BMI is the independent factor. BMI in elderly is an important predictor of both chronic heart disease and stroke which is explained in this study. As we know high level of total cholesterol in elderly is a major risk for cardiovascular disease. Around 55% of total cholesterol was obtained in this study and out of that only 45% was obese and overweight.[7]

There been discussion whether cholesterol is increased with age or changes in lifestyle. Based on some study says that increasing production of LDL is one of the important factor in rise of total cholesterol with age. But it is still not clear on how mechanism is related to changes in lifestyle and how it is influenced. For example, communities seem to not have increase in total cholesterol with age.[5] In fact total cholesterol in some elderly is under control. The theory says women tend to have high LDL than men seem to be proven wrong in this study. But if there is interaction between age and changes in lifestyle like excess bodyweight can be explained. Even in this study some of the elderly which is obese have normal cholesterol level so mechanism on how total cholesterol affects in our body still unclear. Only 45% of the elderly adults with excess bodyweight have high cholesterol level.[8]

Total cholesterol is caused by several risk factors. It is divided into modifiable and non-modifiable risk factors. Some of the modifiable risk factors are blood pressure, body mass index, temperature, myocardial infarction, smoking, alcohol intake, lack of physical activity and diet. Examples of non-modifiable risk factors are race, gender, age, and heredity. These risk factors usually interact with each other especially body mass index and blood pressure and eventually lead to cholesterol. All these risk factors will have different effect on each of the individual depending on their age since we only tested on elderly patient age from 60-80 years old to know whether these patients undergo high level of cholesterol. During old age, access to medical care, social support and resilience might be the cause of heart disease due to high level of cholesterol.[7]

CONCLUSION
As a conclusion, in this study found that excess body weight and age is less prevalent with total cholesterol compare to

other studies. Maybe it is because of total population that is taken in this study is very less compare to others. So the results do not really show much prevalence. According to the theory, increased BMI in elderly adults will show association with total cholesterol. Based on this, study increased cholesterol in asgselderly adults with increased of BMI cannot be firmly proven because of the limitation of the population.

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