DESCRIPTION OF TRIGLYCERIDE LEVELS IN MEN WHO CONSUME ALCOHOLIC BEVERAGES IN BONGOIME VILLAGE, TILONGKABILA DISTRICT, BONE BOLANGO REGENCY, GORONTALO PROVINCE

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ABSTRACT

Alcohol consumption is often associated with increased plasma triglyceride concentrations and has relevance to the risk of cardiovascular disease and pancreatitis. Ethanol consumed, as much as 90%, will be metabolized by the body, especially in the liver. Ethanol metabolism in the liver results in an increase in *cytosolic and mitochondrial nicotinamide adenine dinucleotide dehydrogenase* (NADH), leading to disruption of normal metabolism in the liver. The purpose of this study is to find out the picture of thyrglyceride levels in men who consume alcoholic beverages. The method in this study uses a quantitative approach with a descriptive type of research. The sampling technique in this study uses *a purposive sampling* technique, assuming the number of samples is 20 samples. Using univariate data analysis techniques. The results of the study showed that in people who consumed alcohol seen from the frequency distribution based on age, at the age of 20-30 years had a thyricide level of (35%), at the age of 31-40 years there was a total (45%), at the age of 41-50 there was a total (10%), and 51-60 a total (10%), the results showed that the most presentation was at the age of 31-40 years with a percentage (45%) based on the results of triglyceride tests in alcohol consumers, Normal results were obtained from 13 respondents and abnormal results for 7 respondents, with an average normal result of 105 mg/dl and an average abnormal result of 231 mg/dl and there was an influence on the number of alcohol consumers with triglyceride levels.

Keywords: Triglycerides, Alcohol, Smoking, Hypertiglycerides

INTRODUCTION

Alcoholic beverages contain ethanol which can cause unconsciousness. Alcohol can be dependence. If alcohol is consumed excessively and continuously, it can have a negative impact on the body directly or indirectly [8] Alcohol consumption causes a reaction of chemical compounds that cause necrosis that increases the likelihood of kidney failure [26]

The National Narcotics Agency (BNN) reports that 3.2 million people, or 1.5% of the population, have a history of abuse of drugs, alcohol, psychotropics, or other addictive substances (NARZ), and 46% of them have the habit of drinking alcohol [9]. Alcohol is now a global problem. According [9] around 87% of British people have drunk alcohol in recent years. This compares to 85% of people in the United States who have ever drunk alcohol and 51% of people who drink alcohol today. Alcohol consumption in Indonesia in 2018 was 3.3% nationwide. As the 6th in Indonesia, Gorontalo residents consume an average of 8.55 liters of liquor a month, according to tribungorontalo.com. Data shows that during the operation to turn on Otanaha in 2023, all ranks of the Gorontalo Police confiscated 3,305 liters of alcoholic

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beverages (Mihol). In addition, the Gorontalo Police destroyed thousands of liters of liquor in Gorontalo West City Regency. At the time, many liquors were banned, including star beer, rat prints, pinaraci, and freshness.

Data shows that in 2023, the number of people in Gorontalo Province who drink liquor will increase. Alcohol consumption poses a common health risk. Bone Bolango Regency is in second place with a percentage between 11% and 12%. Alcohol has many negative effects. Liver disease, from the mildest to the most dangerous, damages liver tissue, interferes with the absorption of nutrients, causes malnutrition, high blood pressure, abnormal heart rate, decreased libido, and problems with the absorption of nutrients. Brain disorders can lead to loss of self-control, staggering, difficulty speaking, decreased intellectual ability, memory loss, amnesia, and nerve tissue damage. In addition, alcohol consumption increases triglycerides, LDL, and fibrinogen [2]

Most ethanol is metabolized in the body when alcohol or ethanol enters, especially in the liver. This causes an increase in cytosolic nicotinamide, adenine dinucleotide dehydrogenase (NADH) and mitochondria in the liver, which interfere with the normal metabolism of the liver. In the reaction mechanism, alcohol dehydrogenase (ADH) in the cytosol is converted into harmful acetaldehyde. Aldh then oxidizes this acetaldehyde in the mitochondria. After being released from the liver, the triglycerides then enter the blood vessels. Of the fifty samples of alcohol drinkers, a study conducted by [8] found that 29 samples (58%) had normal triacylglycerol levels; 9 samples (18%) had high threshold levels; 11 samples (22%) had high levels; and one sample (2%) had very high levels. In almost the same study, individuals who had been drinking alcohol for more than 15 years [21]

According to research and surveys conducted in October 2019 by the Central Statistics Agency (BPS) and the Gorontalo Provincial Regional Planning and Development Agency (Bappeda) team, Gorontalo Province ranks fourth out of all Indonesia in the amount of liquor consumed. Regional Regulation Number 16 of 2015 in Gorontalo stipulates a law that regulates and supervises the use of liquor. Research in Bongoime Village in Tilongkabila District, Bone Bolango Regency, found that adults and adolescents in the area are used to drinking alcoholic beverages without realizing its negative effects on their health.

This research is important because it will inform the people of Bone Bolango, especially Bongoime Village, about the dangers and side effects of alcohol. This is because Bone Bolango people are the second person who drinks the most alcohol, according to the study, with a percentage of 11-12%. Therefore, the researcher would like to give the title "Overview of triglyceride levels in men who consume alcoholic beverages in Bongoime Village, Tilongkabila District, Bone Bolango Regency, Gorontalo Province".

[29] showed that alcohol belongs to the group of organic compounds consisting of hydrocarbons. A number of biochemical processes occur when alcohol enters the body. The liver metabolizes the enzyme alcohol dehydrogenase (ADH) and the coenzyme nicotinamide adenine dinoclotide (NAD) for most of the 90% of alcohol consumed by humans. In this process, ADH converts acetaldehyde into the enzyme aldehyde dehydrogenase (ALDH), which then oxidizes acetic acid into carbon dioxide and water. During this process, the metabolism of pyruvate, fructose, glyceraldehyde, and alanine is also accelerated.

[10] states that the general term for organic matter with an OH- hydroxyl group is alcohol. According to the way it

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works, alcohol is divided into many groups. Side effects can arise from the simplest types of ethanol and methanol. For most of the 90% of alcohol consumed by humans, the liver metabolizes the enzyme alcohol dehydrogenase. During this process, ADH converts acetaldehyde into aldehyde dehydrogenase (ALDH) enzyme, which then oxidizes acetic acid into Carbon dioxide and water. During this process, the metabolism of pyruvate, fructose, glyceraldehyde, and alanine is also accelerated.

Alcohol is divided into many classes based on how it works. The simplest types of ethanol and methanol can cause side effects. Alcohol, a fermentation product, is metabolized by the body in a variety of ways.

Adverse effects of consuming alcohol include fatigue, pressure, and overdose, according to [22]. Tuak, which is different from the sap plant, and brem, which is made from rice, is also used to cook it in Indonesia. Alcoholism has the potential to cause organic mental disorders (GMOs), which typically lead to behavioral changes such as a desire to fight or commit violence, an inability to judge reality, problems with social functioning, and problems with work. In addition, they experience physical changes, such as walking the wrong way, having a red face color, or squinting eyes. Loss of focus, nonsensical speech, or irritability are psychological problems that can be experienced by those who drink alcohol.

The body undergoes a number of biochemical processes when alcohol enters (Husada and Salsabila 2019). The process of alcohol metabolism occurs in two pathways. The alcohol dehydrogenase (ADH) pathway functions first. The process of formation of acetaldehyde from alcohol is catalyzed by ADH. Because it is highly reactive, acetyldehid can damage tissues. The liver oxidizes acetyldehide with aldehyde dehydrogenase (ALDH) in its subsequent reaction. Furthermore, ALH

is connected to mitochondria with nicotinamide adenine dinucleotide (NAD). Once this reaction occurs, the acetate is further metabolized, producing CO_2 and air or used to form acetyl CoA. When ethanol is converted to acetaldehyde, hydrogen ions are removed from alcohols especially NADH, which is responsible for many metabolic problems. The Microsomal Ethanol-Oxidizing (MEOS) Pathway System in the endoplasmic reticulum is part of cytochrome P450, also known as CYP, such as CYP2E1, CYP1A2, and CYP3A4. using NADPH to process ethanol. Reductase and alcohol lecithin are broken down into acetaldehyde by the three cytochrome P-450 microsomal parts.

The alcohol level in various beverages and packaging was assessed using three categories of beverages. [36] distinguishes three types of alcohol. Presidential Regulation Number 74 of 2013 does not set a safe threshold for alcohol. However, based on the level of alcohol they consume, people can be put into three different groups. The first group is known as "light drinkers", and the second group is known as "medium drinkers". The amount they drank ranged between 0.28 and 5.9 grams, or about a bottle of beer.

If you drink alcohol every day and continue to increase it, you can develop a phonoma tolerance, which means you can experience negative side effects or symptoms from alcohol use, or effects or symptoms caused by the amount of alcohol in your blood. The physical effects of alcohol are also associated with the risk of liver damage. Alcohol can also cause diseases such as cancer, heart disease, and nerve problems. The social influence of alcohol users can make the sufferer very unstable, easily seizure, and unconcerned about their environment. When the sufferer's self-control center is disturbed, they lose control and become aggressive. Drinking a lot almost always causes liver cirrhosis [15]

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Alcohol can cause neurological problems such as depression, difficulty walking, memory loss, and dementia in psychoneurology. Alcohol additives can cause imsomnia, mental distress, and psychiatric problems [16]

Alcohol is known to affect triglyceride metabolism. The hormone-sensitive lipase enzyme hydrolyzes triglycerides, the main ingredient of adipose tissue. Triglyceride levels in the blood can increase due to excessive consumption of proteins, fats, and carbohydrates.

Chances of developing atherosclerosis, a condition in which plaque forms in the blood vessels. Coronary heart disease and stroke can appear as a result of blood plaques that clog blood vessels [1]

Alcohol consumption is linked to metabolic syndrome and heart disease. The liver produces more triglycerides through the activation of carbon into fat and the cessation of fatty acid oxidation through continuous ethanol metabolism. The link between ethanol consumption and the likelihood of developing pancreatitis and heart disease. In general, research shows that alcohol affects many diseases in two stages or depending on the amount of alcohol consumed.

Coronary heart disease (CHD) can occur because more triglycerides are removed from the liver from the blood vessels, leading to triglyceride buildup in the blood [21]. The risk of atherosclerosis, which is the formation of plaque in the blood vessels, increases with high levels of triglycerides in the blood (more than 200 mg/dl). This plaque clogs blood vessels and can lead to a lipase stroke. One of the factors that increases the risk of metabolic and cardiovascular diseases is abnormal lipid levels in the blood which are associated with increased triglyceride levels [1]

In adipose tissue, triglycerides function as the main lipid stores. Although triglycerides are made by the liver naturally, eating foods high in sugar can

cause this increase. An increase in the amount of triglycerides, a source of energy, can be detrimental to health. Insulin resolution and higher LDL cholesterol levels (Low Density Lipoprotein) can be the main causes [33]. [22] stated that increased triglyceride levels cause atherosclerosis A, which leads to hardening of blood vessels.

The body stores heat from the food consumed in its fat cells as energy reserves. The body uses fatty acids to carry out its metabolism. The body protects bones and other vital systems from damage by producing energy from triglycerides. [6] showed that triglycerides compare cholesterol through lipoprotein electrophoresis, provide energy to the heart muscle and skeletal muscle, and store enough energy reserves to produce a lot of ATP. In addition, hyperlipoproteinemia is caused by an increase in triglyceride concentration.

Metabolic reactions to food intake are influenced by many things. It greatly affects the amount of nutrients and non-nutrient components present in food, as well as energy and macronutrients (proteins, carbohydrates, fats, and alcohol). The structure and consistency of the food also affects the psyche. Other influencing factors. Foods that are commonly eaten after one night of fasting have a faster metabolic effect than eating too much, according to stock.

Resilience or susceptibility to disease in the family is often associated with family relationships. One percent of people have lipoprotein metabolic abnormalities that cause coronary heart disease. This disorder is usually found in families who have a history of coronary heart disease.

[14] states that the diagnosis is determined by the results of the examination of other individuals in the family. Smoking: One of the many risk factors for arteriosclerosis is the impact of cigarettes on triglyceride metabolism. The adrenal sympathetic system can be aided

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by nicotine by producing higher secretion of the hormone catecholamine. Higher lipolysis leads to an increase in free fatty acids [22]

Daily alcohol consumption between 30 and 60 milliliters can increase HDL (HighDensity Lipoprotein), but more frequent alcohol consumption can also increase triglyceride levels. higher body weight index is between 25–27 kg/m2; and obesity is common when BMI is more than 27 kg/m2 [24]

The fat buildup in the liver cells can interfere with the liver, so liver cells should not contain a lot of fat. Diseases that interfere with liver function are referred to as "liver diseases" (Salim et al., 2021). decreased levels of HDL cholesterol, which in turn leads to plaque buildup by LDL cholesterol in the arterial intima wall [36]

The results of triglyceride levels without fasting are expected to increase. Then, this VLDL is converted to LDL, increasing the circulating concentration of LDL and possibly clearing the LDL receptor system, while fasting LDL concentrations are very low. Studies show that food consumption and fat load increase serum triglycerides. The findings suggest that lipoproteins rich in triglycerides and LDL have a relationship between change in size and lipid transport. In hyperlipidemia, triglyceride levels increase after eating. For individuals with normal fasting triglycerides, there was no correlation between LDL size and fasting triglycerides. In contrast, the response to fat load after eating has a strong correlation with triglyceride size [30]

Performing serum lipid profile checks is now common. There are many tasks to complete here. To assess and manage cardiovascular disease, fasting lipid profiles should be used [20]

RESEARCH METHODS

This study uses quantitative research. This type of research is a type of descriptive research. It will be held on July 7-12, 2024. Laboratory of Toto Kabila Hospital, Bone Bolango Regency

Primary data comes from the results of examinations conducted by researchers. Secondary data consists of supporting data and literature used to complete the research. The data source comes from the results of triglyceride examination using an automatic tool (Mindray BS-380). The population in this study was all men who consumed alcohol in Bone Bolango district. The sampling technique used is purposive sampling by paying attention to several criteria.

The data collection technique is by *Informed Consent* and laboratory examinations. *Informed Consent* in the form of a consent sheet to be signed by respondents who are willing to be used as research subjects. Laboratory Examination; Pre Analytics, Patient Preparation: filling *Informed Consent* and Questionnaire and sign it, preparation of tools and materials: Centrifuge, Mindray (BS-380), Micropipette, Serology tube, Tube rack, *Yellow tip, Torniquet, Spuit,* Timer, Cotton alcohol, Plaster. Serum samples,*Phosphate buffer, 4-Chlorophenol, ATP, Mg2+, Glicerokinase, Peroxidase, Lipoprotein lipase, 4-Aminoantipyrine, Glycerol-3-phosphate-oxidase*. Venous Blood Intake, Attaching a tourniquet to the responder's arm, Clean the part of the skin where the blood will be taken using alcohol swab and let it dry, inject with a needle position of 30º with the skin, if blood is visible in the syringe then immediately remove the turniquet, remove the syringe, and then smear the scar with dry alcohol [3] Analytics i.e. Serum creation, Let the blood sit for 15-30 minutes until it freezes, perform blood centrifugation for 10 minutes at a speed of 3000 rpm, separate the serum from the sediment, then put it in a tube that has been identified.

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In this analysis, and measurements were made for each observation. Univariate analysis uses a descriptive test.

RESEARCH RESULTS

1. Sample Characteristics

Table 4.3 Frequency distribution by Age

Age	N	Percent
20-30 Years	7	35 %
31 – 40 Years	9	45 %
41 – 50 Years	2	10 %
51 – 60 Years	2	10 %
Sum	20	100 %

Source: Primary Data Research July (2024)

Table 4.3 Distribution of frequencies by age of alcohol consumption shows that the most presentation is at the age of 31-40 years 9 (45%) people and the least at the age of 41-50 and 51-60 years 2 (10%) people.

Table. 4.4 Frequency distribution based on smoking history

Smoke	N	Percent
Smoke	19	95 %
No smoking	1	5 %
Sum	20	100 %

Source: Primary Data Research July (2024)

Table 4.4 Distribution of precursors based on smoking history shows that the presentation of smoking with the number of 19 (95%) people and non-smoking with the number of 1 (5%) people.

Table. 4.5 Frequency distribution based on length of alcohol consumption

Length of alcohol consumption (years)	N	Percent
< 1 year	3	15 %
> 1 year	17	85 %
Sum	20	100 %

Source: Primary Data Research July (2024)

Table 4.5 Distribution of predurations based on length of alcohol consumption (years) shows that the presentation < 1 year with a total of 3 (15%) people and > 1 year with a total of 17 (85%) people.

Table. 4.6 Frequency distribution based on duration of alcohol consumption

Duration of Alcohol Consumption/ day	N	Percent
< 1 bottle	18	90 %
1-2 bottles	2	10 %
> 2 bottles	0	0 %
Sum	20	100 %

Source: Primary Data Research July (2024)

Table 4.6 Distribution of prevalence based on duration of alcohol consumption shows that the most presentations are 18 (90%) people.

2. Univariate Results

The results of univariate analysis of triglyceride level examination in men who consume alcoholic beverages can be seen in Table 4.7

Table. 4.7 Triglyceride test results in alcohol consumers

Respond	Normal	Abnormal
MR	146 mg/Dl	-
FK	-	242mg/dL
RM	85mg/dL	-
AND AND	139mg/dL	-
JM	-	253mg/dL
FNK	-	195mg/dL
SB	80mg/dL	-
RB	-	285mg/dL
IA	67mg/dL	-
AR	88mg/dL	-
J	110mg/dL	-

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WT	121mg/dL	-
RM	-	220mg/dL
RS	-	250mg/dL
IN	-	172mg/dL
ST	133mg/dL	-
IA	100mg/dL	-
GERMAN	91mg/dL	-
RR	98mg/dL	-
On the	110mg/dL	-
Rata-rata	**105 mg/dL**	**231mg/dL**

Ket: Nilai Normal < 150 mg/dL dan Abnormal> 150 mg/dL

Table 4.7 results of triglyceride test in alcohol consumers showed that the normal results were 13 respondents and abnormal 7 respondents

DISCUSSION

In table 4.3, seen from the frequency distribution by age, it shows that at the age of 20-30 years there are 7 (35%) respondents, the age of 31-40 years is 9 (45%) respondents, the age of 41-50 years is 2 (10%) and the age of 51-60 years is 2 (10%). It can be seen that the age that consumes the most alcoholic beverages is at the age of 31-40 years, because in terms of employment, more hardworking people consume alcohol with their perception that alcohol can increase stamina during and after work. This is in line with [33]. The results showed that triglyceride levels varied based on the respondents' age, gender, and physical activity level; Private workplaces had the highest triglyceride levels (35.72 percent), and the highest respondents' age was between 31 and 40 years old (46.15 percent).

In table 4.4, the frequency distribution based on smoking history, 19 (95%) people smoke and 1 (5%) do not smoke. In addition to consuming alcoholic beverages, smoking can also affect triglyceride levels. According to Wowor. [2] Cigarette smoke contains nicotine. Normal triglyceride levels of smokers exercise frequently, maintain a balanced diet, and exercise infrequently.

In table 4.5, the distribution of frequencies based on the length of alcohol consumption, shows that the < of 1 year is 3 (15%) people, and > 1 year is 17 (85%). This is in accordance with research where > 1 year more has a higher triglyceride yield than < 1 year. This is supported by previous [9]. Then the most normal and abnormal in a period of 1-2 years have the same number, namely 6 reports (20%), so it can be seen that there is no relationship between the length of alcohol consumption and triglyceride levels. This is also in line with the research of [8] The most results were obtained in a period of 5-10 years with a total of 42 (42%), and the least with a period of 11-15 years with a total of 4 (4%).

In table 4.6 frequency distribution based on the duration of alcohol consumption, it shows that < 1 bottle per day amounts to 18 (90%), and 1-2 bottles per day amounts to 2 (10%), and more than 2 bottles have no results. According to Purbayanti. D,& Saputra N. 2017. People who consume alcohol more than once daily have a three-fold higher risk of chronic heart disease (CHD) and strokes, especially in young people, depending on the length of the alcohol consumption. This is in line with a study conducted in January 2022, which found that 17 respondents (56.7%) had triglyceride levels higher than normal at 1-2 times a week and 6 respondents (20.0%) at more than 5 times a week.

In table 4.7 based on the results of the triglyceride test on alcohol consumers, it was obtained with normal results, namely 13 respondents and abnormal 7 respondents. In normal results, there are several factors that affect the value of triglyceride levels, namely disease history, diet, and activity. Based on the results of the interviews obtained, there are still many respondents who do not have a history of comorbidities, regulate their diet, especially still consuming fruits and vegetables, and activities that are carried

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out almost every day, especially for workers, namely workers and farmers. The high results obtained in triglyceride levels in alcohol consumption are due to age and lack of activity so that triglyceride levels in the body are not processed properly so that it becomes fat levels in the body. According to [33] The results of the study showed that the number of normal respondents was 38 people (76%), and the upnormal results were 12 (24%).

CONCLUSION

The results of the triglyceride test on alcohol consumers were obtained normal results of 13 people (65%) and abnormal results of 7 people (35%). The results of the triglyceride test on alcohol consumers showed that the average normal result was 105 mg/dL and the average abnormal result was 231 mg/dL and there was an influence on the number of alcohol consumers with triglyceride levels.

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