DESCRIPTION OF BILIRUBIN CONDITION CHECKING ON ALCOHOL CONSUMER IN EAST POHUWATO VILLAGE, POHUWATO DISTRICT

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ABSTRACT

Based on 2014 WHO data, 61.7% of the world's population has consumed alcohol for more than 12 months which has caused around 3.3 million deaths or 5.9% of all deaths worldwide. For the 2018 RISKESDAS data in Indonesia, the first highest alcohol consumption area is North Sulawesi 16%, followed by East Nusa Tenggara 15.6, then Bali area 14%, and for Gorontalo area 11.3%.

The purpose of this study was to determine the description of bilirubin levels in alcohol consumers in Pohuwato Timur Village, Pohuwato Regency including the length of time of consumption, age, types of drinks frequently consumed, frequency of alcohol consumption, and frequency of the amount of alcohol in one drink. This research uses descriptive research which is quantitative in nature. The population in the study was 55 samples with a sample size of 36 respondents who used the sampling technique, namely simple random sampling.

The results showed that of the 36 respondents where the normal bilirubin levels were 14 respondents or if the percentage was 39%, while for the abnormal or high bilirubin levels there were 22 respondents or if the percentage was 61%. Based on the results obtained, it can be concluded that the results of the examination of bilirubin levels in alcohol consumers in Pohuwato Timur Village, Pohuwato Regency are more dominant with abnormal or high levels compared to normal bilirubin levels.

Keywords: Alcohol, liver, bilirubin levels

INTRODUCTION

Success. implementation. health is very much determined by the continuity between program and sector efforts, as well as the continuity with the efforts that have been implemented by the previous government. Health development efforts in Indonesia need to be carried out in an integrated manner so that existing resources can be utilized effectively and efficiently [9].

Disease control is an effort to reduce the incidence, prevalence, morbidity or mortality of a disease which plays an important role in measuring the degree of public health. The indicators used in assessing the health status of a community are the morbidity and mortality rates [9].

Illness can arise from several habits, one of which is the habit of the community in consuming alcoholic beverages which are often considered normal. Alcohol is a liquid that is clear in color and contains ether in the form of liquid or liquefied through the fermentation process. Commonly consumed alcohol is also known as ethyl alcohol (ethanol) [11].

Liquor has long been recognized among the public and has become a common problem around the world. As many as 61.7% of the population worldwide has consumed alcohol for more than 12 months which causes approximately 3.3 million deaths or 5.9% of all deaths worldwide [22].

World alcohol consumption is equivalent to 6.2 liters of pure alcohol consumed per person aged 15 years or over which means 13.5 grams of pure alcohol per day. A quarter of this consumption (24.8%) unrecorded is homemade alcohol and is produced or sold illegally outside government control. Of the total recorded alcohol consumed throughout the world, namely amounting to 50.1% [21].

More than 3 million people worldwide die from drinking alcohol and the largest number of victims occurs in Europe. This is due to a lack of public awareness about the dangers of consuming alcohol. On average, every person in the world aged 15 or over consumes 6.2 liters of pure alcohol per day. About 16% of drinkers in the world engage in heavy episodic drinking or often referred to as binge drinking and this is the most dangerous for health, especially for the liver which functions to filter the entry of foreign substances or toxins in the body [20].

Data from 241,000,000 people in Indonesia, the prevalence of disorders due to alcohol use is 0.8% and the prevalence of alcohol dependence is 0.7% in both men and women. When viewed from the percentage, the prevalence of disorders due to alcohol use and the prevalence of alcohol dependence is very small. However, if this figure is multiplied by the total population of Indonesia, as many as 1,928,000 Indonesians suffer from alcohol use disorders and 1,180,900 Indonesians experience alcohol dependence [22].

Data in Indonesia for the highest alcohol consuming region is North Sulawesi at 16%, followed by East Nusa Tenggara (NTT) 15.6%, then Bali area 14%, and for the Gorontalo area as much as 11.3% [14].

Data on alcohol consumption in Gorontalo Province for the first regency in alcohol consumption per liter in 1 year, namely Boalemo Regency at 148.52 / liter, in the second position Gorontalo Regency at 118.77 / liter, then Bone Bolango Regency at 98.4 / liter, after that, Pohuwato Regency was 88.93 / liter, then North Gorontalo Regency was 80.58 / liter, and finally Gorontalo City was 16.25 / liter [1].

According to the results of direct observations made by researchers on the habit of consuming alcohol in the community in Pohuwato Timur Village, Pohuwato Regency, it was found that there were three residents who experienced several disorders of body function after several years of consuming alcohol. Where the malfunctioning of the body includes damage to lung function and the presence of symptoms of damage to liver function, namely having experienced symptoms of jaundice or where the body and eyes are yellowish.

Dependence on alcohol consumption is very dangerous for the health of the human body, one of which is harmful to the health of the liver. The liver is the largest and most metabolically complex organ in the body. The liver itself is involved in the metabolism of food substances, as well as most drugs and toxins. The liver has the main task of neutralizing toxins in the body, making the toxins that have been entering our bodies from food or the environment able to be neutralized by the liver. There are many factors that can cause liver damage, such as viruses, bacteria, toxicity from drugs and chemicals and excessive alcohol consumption [6].

Bilirubin examination is one of the parameters of laboratory tests, where this examination functions to detect damage to liver function and bile ducts. For damage to liver function, several diseases can occur, including hemolytic anemia, liver cirrhosis, hepatitis, and hepatitis carcinoma, where if some of these diseases occur it will be marked by increased levels of bilirubin in the body. So if the liver and bile function are in good condition, the bilirubin levels in the body are also normal [5].

Based on the description and research above, the researchers are interested in conducting research on the description of checking bilirubin levels in alcohol consumers in Pohuwato Timur Village, Pohuwato Regency. Where the purpose of this study is to determine the description of bilirubin levels in alcohol consumers in East Pohuwato village with several factors such as age, duration of alcohol consumption, type of drink, alcohol consumption in a week, and the amount of alcohol in one drink.

RESEARCH METHODS

This research uses descriptive research with a quantitative approach [15]and a cross sectional research design [13]. The sampling location was in Pohuwato Timur Village, Pohuwato Regency and examination of serum bilirubin samples at Bumi Panua Pohuwato Hospital. The research was carried out on 23-29 October 2020. The sample in this study was alcohol consumers in Pohuwato Timur Village, Pohuwato Regency. The sample met the inclusion criteria, namelyrespondents are willing to have blood samples taken, can communicate well, are alcohol consumers who are in Pohuwato Timur Village, Marisa District, Gorontalo City, alcohol consumers who up to now still frequently consume alcohol, and alcohol consumers who are 21-60 years old andthe sample does not meet exclusion criteria that isrespondents who are not willing to have their blood samples taken, respondents cannot communicate well, alcohol consumers who are not in Pohuwato Timur Village, Marisa District, Gorontalo City, alcohol consumers who are rarely or no longer consume it, and alcohol consumers who are not aged 21- 60 years. The sample size is 36 samples determined by the Slovin formula. The sampling technique is Simple Random Sampling. The technique of data analysis is univariate analysis and data presentation is the frequency distribution table [10].

Duration of Consumption Alcohol	Bilirubin levels			
	Normal		Abnormal	
	N	%	N	%
> 6 months	-	-	-	-
1 year	2	6%	-	-

RESEARCH RESULT

This study aims to determine the description of bilirubin levels in alcohol consumers in Pohuwato Timur Village, Pohuwato Regency and based on respondent characteristics such as age, duration of alcohol consumption, type of alcohol drink, alcohol consumption in a week, and the amount of alcohol at one time.

Table 1.
Distribution of Bilirubin Levels by Age

Age	Bilirubin levels			
	Normal		Abnormal	
	N	%	N	%
22-41	13	36%	18	50%
42-60	1	3%	4	11%
Total	14	39%	22	61%

Source: Primary Data, 2020

Based on table 1, it shows that the abnormal bilirubin level is higher at the age of 22-41 years, which is as much as 50% compared to the age of 22-41 years which is as much as 11%.

Table 2.
Distribution of Bilirubin Levels Based on Duration of Alcohol Consumption

Source: Primary Data, 2020

Based on table 2, it shows that the abnormal bilirubin level is higher in the 2-year consumption period, which is 55% compared to the normal bilirubin level for alcohol consumption> 6 months and 1 year, i.e. there is no abnormal bilirubin level.

Table 3.
Distribution of Bilirubin Levels by Type of Drink

Type Drink	Bilirubin levels			
	Normal		Abnormal	
	N	%	N	%
Beer	3	8%	3	8%
Rat stamp	11	31%	19	53%
Total	14	39%	22	61%

Source: Primary Data, 2020

Based on table 3, it shows that the abnormal bilirubin level is more in the type of rat stamp drink, namely as much as 53% compared to the type of beer drink, which is as much as 8%.

Table 4.
Distribution of Bilirubin Levels Based on Weekly Alcohol Consumption

Consumption of Alcohol in a Week	Bilirubin levels			
	Normal		Abnormal	
	N	%	N	%
Every day	1	3%	2	6%
2-3 times	11	30%	17	47%
4-5 times	2	6%	3	8%
Total	14	39%	22	61%

Source: Primary Data, 2020

Based on table 4, it shows that abnormal bilirubin levels are more in alcohol consumption in a week, namely 2-3 times as much as 47% compared to alcohol consumption in a week every day as much as 6% and 4-5 times as much as 8%.

Table 5.
Frequency Distribution of Bilirubin Levels Based on the Amount of Alcohol One Drink

Amount of Alcohol Once Drink	Bilirubin levels			
	Normal		Abnormal	
	N	%	N	%
2-3 glasses	6	17%	7	19%
4-6 glasses	7	19%	14	39%
> 6 cups	-	-	2	6%
Total	13	36%	23	64%

Source: Primary Data, 2020

Based on table 5, it shows that the abnormal bilirubin level is more in the amount of alcohol at one time, namely 4-6 glasses as much as 39% compared to the amount of alcohol once drinking 2-3 glasses as much as 19% and those> 6 glasses as much as 6%.

Table 6.
Distribution of Bilirubin Level Examination in Alcohol Consumers

Result Grade Bilirubin	Frequency Respondents	Percentage
Normal	14	39%
Abnormal	22	61%
Total	36	100%

Source: Primary Data, 2020

Based on table 6, it shows that the bilirubin level is more at the abnormal bilirubin level as much as 61% compared to the normal bilirubin level as much as 39%.

DISCUSSION

Alcohol is a psychoactive substance with addiction-producing properties that have been widely used in many cultures for centuries. Harmful use of alcohol can cause many diseases. Alcohol-related harm is determined by the volume of alcohol consumed, drinking patterns, and the level of alcohol consumed [20].

Alcohol metabolism is processed in the liver. Where if the concentration of alcohol consumed is still within normal limits, it will not significantly affect liver damage. But if the concentration of alcohol consumed has exceeded the normal limit or is excessive, it will affect liver function damage, one of which can affect the increase in bilirubin levels in the liver.

Liver damage can cause several liver diseases, one of which is liver cirrhosis. Where the disease is 50% caused by long-term effects in the abuse of alcohol consumption. To be able to detect liver cirrhosis, liver function tests can be done, one of which is checking the bilirubin levels.

Characteristics of Respondents by Age

The human body is equipped with a set of defense systems and in response to free radicals, the liver can regenerate itself but the ability to regenerate is greatly influenced by age [15]. Increasing age affects metabolism in the body so that changes occur both physically and biologically. These changes will affect the absorption process in the body. At a young age, namely the age of 18 years and over is the productive age. The human body is still in a period of increased metabolism this is due to the fact that the body experiences significant growth which is influenced by one's physiological condition. As you get older, at the beginning of the age of 30 years the amount of muscle will begin to decrease and the body's ability to metabolize the body will decrease and at the age of 40 the body's metabolism will continue to decline. So it can be explained that age and the body's defense system can be the reasons for the abnormal bilirubin levels in the respondents in this study.

Based on the age distribution, the first started from the age range 22-41 years where the abnormal level was more dominant, namely 50%. This is because in that age range a person begins to consume alcohol frequently, and is supported by strenuous activities, where the majority of the men in Pohuwato Timur Village work as fishermen. So that the habit of frequently consuming alcohol in excess can cause damage to the liver, one of which is an increase in bilirubin levels in the liver. Then for the age range 42-60 years, the abnormal bilirubin level was 11%. This means that for this age group less than the first age group. This is caused by the age factor itself. Where at that age is susceptible to disease and the immune system at that age range begins to decline. Then in that age range there was also some decline in organ function, one of which was the liver. So if at that age the liver is often exposed to alcohol, it will further aggravate the physiological condition of a person [11].

Characteristics of Respondents Based on Duration of Alcohol Consumption

Chronic alcohol consumption of 90g of alcohol per day for 5 years or more in

humans can result in pathological changes and diseases in several organ systems such as liver, heart and pancreas, pathological changes observed are fibrosis and cardiopathy due to alcohol poisoning [17].

Based on the distribution of the duration of alcohol consumption, the abnormal bilirubin level was higher in the 2-year consumption period, namely as much as 55%. Then for the duration of alcohol consumption> 6 months and 1 year there were no abnormal bilirubin levels.

Characteristics of Respondents by Type of Drink

The ethanol that is consumed will be absorbed by the stomach as much as 20% and the intestine as much as 80% which will then undergo metabolism in the liver. The concentration of ethanol present in the blood determines the speed of the metabolic processes in the liver that produce astaldehyde. Acetaldehyde that accumulates in the liver will cause damage to the liver, specifically damage to hepatocytes (hepatic cells) because acetaldehyde is a very reactive free radical. This means that the greater the concentration or alcohol content, the more it will affect the metabolic processes in the liver and can cause damage to the liver [16].

For the types of drinks that are often consumed, the first type of beer is the type of beer where the abnormal bilirubin level is 8% and the alcohol content of this type of beer is included in group A where the levels start from 1-5%. Then the second type of drink that is often consumed is rat stamp, where the abnormal bilirubin level is more dominant, which is 53%. The alcohol content of stamp rat drinks is around 45% or is included in class C and the highest group so that the stamp rat drink affects bilirubin levels more because its levels are higher than that of beer [18].

Respoden Characteristics Based on Alcohol Consumption in a Week

Excessive intake of alcohol and for a long time will cause an increase in bilirubin levels, this is because alcohol will stimulate more microsomal enzymes to be produced. Microsomal enzymes are 5 enzymes that play a role in the metabolism of drugs and other toxic substances such as alcohol [7].

For alcohol consumption in a week where the abnormal bilirubin level is more in consumption 2-3 times a week, namely 47%. Then the abnormal bilirubin level in alcohol consumption every day of the week was 6% and that for 4-5 times a week was 8%.

Respondents' Consumption Based on the Amount of Alcohol One Drink

The consumption of alcohol in low amounts will be broken down by the enzyme alcohol dehydrogenase into acetaldehyde (almost 95% of ethanol in the body will be oxidized to acetaldehyde and acetate, while the remaining 5% will be excreted with urine). However, if large amounts of alcohol are consumed, the dehydrogenase enzyme is not sufficient to metabolize all of the alcohol into acetaldehyde. Therefore, the greater the volume of alcohol consumed will cause hepatocyte damage caused by the toxicity of alcohol metabolism end products such as acetaldehyde which will accumulate so that it triggers the enzyme microcosomal ethanol system (MEOS) to metabolize acetaldehyde [4].

For abnormal bilirubin levels in the amount of alcohol one drink, between 4-6 glasses is more dominant, which is 58%. Then for abnormal bilirubin levels in the amount of alcohol one drink between 2-3 glasses as much as 36% and those> 6 glasses as much as 6%.

Variable Bilirubin Levels in Alcohol Consumers

Alcohol is a liquid that is clear in color and contains ether in the form of liquid or liquefied through the fermentation process. Commonly consumed alcohol is also known as ethyl alcohol (ethanol) [10].

Dependence on consuming alcohol is very dangerous for the health of the human body, one of which is harmful to the health of the liver. The liver is the largest and most metabolically complex organ in the body. The liver itself is involved in the metabolism of food substances, as well as most drugs and toxins. The liver has the main task of neutralizing toxins in the body, making the toxins that have been entering our bodies from food or the environment able to be neutralized by the liver. There are many factors that can cause liver damage, such as viruses, bacteria, toxicity from drugs and chemicals and excessive alcohol consumption [6].

Bilirubin examination is one of the parameters of laboratory tests, where this examination functions to detect damage to liver function and bile ducts. For damage to liver function, several diseases can occur, including hemolytic anemia, liver cirrhosis, hepatitis, and hepatitis carcinoma, where if some of these diseases occur it will be marked by increased levels of bilirubin in the body. So if the liver and bile function are in good condition, the bilirubin levels in the body are also normal [5].

*Alcoholic Fatty Liver*is a disease that is reversible in which about 5-12% of people who consume heavy alcohol experience this liver disease. Then if left untreated, it will develop into alcoholic hepatitis to become cystic and liver failure [8].

The primary metabolic process for alcohol occurs in the liver through three stages. Where the initial stage starts from the alcohol dehydrogenase (ADH) enzyme to oxidize alcohol and for this enzyme only a little if exposure to alcohol in the body is only a little too. Then there will be an increase in metabolic rate if the level of alcohol in the blood increases at a moderate level, the maximum is 7-10 grams / hour or the equivalent of one drink in one hour. The second stage of acetaldehyde is converted into acetate by the enzyme aldehyde dehydrogenase. Acetaldehyde itself is normal in its normal state of metabolism and takes place quickly. But if large amounts of alcohol are consumed, this acetaldehyde will cause symptoms such as headaches, gastritis, nausea, and dizziness. The third stage or the final stage, wherein the acetate group is converted into fat or carbon dioxide and water. For chronic alcohol consumption, fat accumulation may occur. Accumulation of fat will cause plugs in the capillaries surrounding the liver cells and can lead to cirrhosis of the liver. After that, scar tissue forms in the liver which will cause blockage of bilirubin in the bile (excretion process), so that the bilirubin again spreads to the blood vessels and causes bilirubin to increase in the blood [5].

Based on the results of research that has been carried out on the description of bilirubin levels in alcohol consumers with a number of respondents as many as 36 people, the results are more dominant than normal. For the results of abnormal bilirubin levels, there were 22 respondents or 61% if a percentage was obtained. Meanwhile, normal bilirubin levels are 14 or 39% if a percentage.

The results of bilirubin levels which were more dominant at high levels were also supported based on the length of time consuming alcohol, the frequency of drinking during the week, the consumption habits of most of the respondents who consumed rat stamped alcohol with a level of 45% where the level was included in the highest category

group C. Alcohol consumption for more than a year can affect liver function [2].

The consumption habits of most of the respondents who consume rat stamp type alcohol with a level of 45% where the level is included in the highest category or group C, so that it can affect liver function and result in most of the respondent's high bilirubin levels. Consumption of alcohol with types of tuak which are included in class B and arak in class C can cause chronic liver disease, one of which is cirrhosis of the liver [6].

The results of this study are also supported by the results of previous research conducted by Djuma and Kapa (2017) that the results of their study regarding the comparison of direct bilirubin levels in alcoholic users and those who do not consume alcohol showed that direct bilirubin levels in the alcohol consuming group were significantly different from the non-consuming group. alcohol. Where the average result of direct examination of bilirubin levels in alcohol consumers is 0.2230 mg / dL and those who do not consume alcohol are 0.1450 mg / dL with a P value <0.05. These results indicate that there is a significant difference in direct bilirubin levels between the case and control groups.

CONCLUSION

Based on the research that has been done, it can be concluded that the results of the examination of bilirubin levels on alcohol consumers in Pohuwato Timur Village, Pohuwato Regency are more dominant in abnormal bilirubin levels than normal bilirubin levels. Where the abnormal bilirubin levels were 61% and normal bilirubin levels were 39%.

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