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The Profile of Reactive Anti-HCV Examination Results Using The Cobas E601 Machine at Blood Donation Unit (BDU) of Indonesian Red Cross Surakarta City in 2020 and 2021

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Abstract
Hepatitis C is an inflammatory disease of liver cells caused by Hepatitis C virus (HCV). Viruses that can cause acute and chronic hepatitis, ranging from mild levels lasting a few weeks to lifelong illness**.** This study aims to describe the results of the Anti-HCV examination using the Cobas E601 tool at Blood Donation Unit (BDU) of Indonesian Red Cross Surakarta City. Methods: This study used a quantitative descriptive study with a cross sectional design, the population and sample were 42 blood donors at BDD of Indonesian Red Cross Surakarta city in 2020-2021. This sampling technique used Total Sampling. Data collection using secondary data and processed using Microsoft Excel. The number of donors who are reactive Anti-HCV are 42 donors and are divided into several categories, namely: based on the results of the Reactive and Non-Reactive Anti-HCV Examination in 2020-2021, the number of blood donors who are reactive Anti-HCV in 2020 is 16 and in in 2021 as many as 26, and as many as 152,534 non-reactive Anti-HCV blood donors, namely in 2020 as many as 73,973 and in 2021 as many as 78,561, based on the highest age range, namely at the age of 25-44 years as many as 24 (57 %), based on the most blood type is blood type B Rhesus Positive as many as 16 (38%), based on gender the most, namely male sex as much as 38 (90%). The most reactive anti-HCV in donors occurred in 2021, age range 25-44 years, male sex and blood type B Rhesus Positif.
Keywords: Anti-HCV, Cobas E601Machine.

INTRODUCTION

Hepatitis C is an inflammatory disease of liver cells caused by the Hepatitis C Virus (HCV). Viruses that can cause acute and chronic hepatitis, ranging from mild levels lasting a few weeks to lifelong disease. Around 150 million people in the world who suffer from chronic hepatitis are infected with the Hepatitis C Virus and more than 350 thousand people die each year due to liver disease associated with Hepatitis C Virus infection. Hepatitis C virus can be found throughout the world, while countries with high rates of chronic HCV disease include Egypt (15), Pakistan (4.8%), and China (3.2%). In general, transmission of HCV disease in these countries is the use of injection equipment such as syringes that are contaminated with the Hepatitis C Virus. Around 75-85% of people newly infected with HCV can suffer from chronic disease and 60-70% of these sufferers can develop chronic hepatitis sufferers. Around 5-20% of chronic Hepatitis C sufferers develop cirrhosis and around 1-5% are reported to die

from cirrhosis or liver cancer. Approximately 25% of liver cancer sufferers are caused by Hepatitis C Virus infection (WHO, 2012).

Hepatitis C virus can cause acute and chronic infections. Acute hepatitis C is an infection that occurs in the first 6 months. This infection usually occurs without symptoms and also rarely causes death. Around 15-45% of sufferers successfully recover from acute Hepatitis C without special treatment. Meanwhile, around 55-85% of the remainder will harbor the virus for a long time, then develop into chronic Hepatitis C infection. People with chronic Hepatitis C have a risk of around 15-30% of developing liver cirrhosis within 20 years and in cirrhosis this complication can be fatal.

Hepatitis C is still a major public health problem in a number of developing countries. Urban and rural areas have different sociodemographic characteristics, but the seroprevalence of hepatitis C based on antibodies to the hepatitis C virus (hepatitis C virus, HCV) in Indonesia based on the results of Basic Health Research (Riskesdas, 2013) shows the same proportion, namely 1.0%, giving rise to suspected differences in risk factors for HCV infection between the two categories of residence (Dany F, 2017). Management of Viral Hepatitis is carried out through health promotion activities, special protection, surveillance of Viral Hepatitis, control of risk factors, early detection & case finding, and case management. Diagnosis is carried out for early detection of Hepatitis C. The earlier the disease is detected, the less the risk of liver damage that may occur. The screening test for Transfusion Transmitted Infection (TTI) in donor blood aims to determine which blood can be transfused with the minimum possibility of TTI.

BDU of Indonesian Red Cross Surakarta City performed a TTI screening test using the Chemiluminescence Immunoassay (CHLIA) method. The CHLIA method has the advantages of being more specific and having high sensitivity. The CHLIA method can be used to examine 4 disease parameters, namely, HBsAg, Anti-HCV, Anti-HIV, and Syphilis. Chemiluminescence Immuno Assay (CHLIA) is an immunoassay method/technique that uses a label or reaction indicator in the form of a luminescent molecule to estimate or determine the concentration of the analyte/sample being analyzed which has a low sample concentration in the blood. It is called Chemiluminescent because it is used for immunoassay techniques that involve chemical reactions. The CHLIA method is divided into two, namely Direct and Indirect. Direct uses luminophore markers, namely chemical compounds that are responsible for luminescence (the ability of a substance to glow/glow in the dark). While Indirect uses enzyme markers used are alkaline phosphatase with 1,2 dioxetane aryl phosphate (AMPPD) as the substrate and horseradish peroxidase (HRP) with luminol or its derivatives as the substrate. The enzyme used in CHLIA converts

the substrate into a reaction product, which emits photons of light, rather than producing a specific color (Wulandari, 2020).

Cobas E601 module for immunoassay tests. The Cobas E601 module is a fully automated analyzer that uses electrochemiluminescence (ECL) technology for immunoassay analysis. Designed for quantitative and qualitative experts in determining various diseases (Roche, 2020). The CHLIA method IMLTD examination using the Cobas E601 tool aims to determine the results of the CHLIA method IMLTD examination using the Cobas E601 tool. The Cobas E601 tool is divided into two parts, namely Software and Hardware. The Software section is used for monitoring samples, reagents, maintenance, and reading results. Meanwhile, hardware consists of reagent containers, liquid medical waste containers, solid medical waste containers, liquid containers, and complementary materials containers. The Transfusion Transmitted Infection (TTI) Screening Test uses a Plain tube containing serum without anticoagulants. Samples with Plain tubes received at the blood testing section will be spun using a Centrifuge at a speed of 3000 rpm for 30 minutes, after which they will be examined using two Cobas/Architect machines. Interpretation of Results:

1. Reactive ≥ 1.00
2. Non Reactive 0-0.84
3. Grayzone 0.85-0.99

Reactive means that the blood contains detectable antibodies and/or infectious antigens, so the blood is not safe for transfusion, and must be destroyed according to standards. Meanwhile, non-reactive means that the blood does not contain antibodies and/or antigens of infectious agents that are detected, so the blood is safe for transfusion. If the TTI screening test is carried out in duplicate and the result is repeated reactive, the donor will be sent a notification letter to come to BDU for an explanation of the results of the screening test and a follow-up on the confirmation test. Reactive donors will be referred to the hospital and referred to Internal Medicine.

RESEARCH METHODS

This research method uses descriptive research using secondary data using a cross sectional approach. The population that will be used in this research is data from reactive Transfusion Transmitted Infection (TTI) Anti-HCV examinations using the Cobas E601 device at Blood Donation Unit (BDU) of Indonesian Red Cross Surakarta City in 2020 and 2021 with a total of 42 samples. The sampling technique used was total sampling. Total sampling is a sample determination technique when all members of the population are used as samples (Sugiyono, 2014), namely 42 samples. The variables in this research use a single variable.

This study uses secondary data from the results of the reactive TTI Anti-HCV examination using the Cobas E601 instrument at BDU of Indonesian Red Cross Surakarta City in 2020 and 2021. The instrument of this research is a recapitulation of the results of the reactive TTI Anti-HCV examination using the Cobas E601 instrument at BDU of Indonesian Red Cross Surakarta City from 2020 to 2021. Data processing techniques in this research are: Data editing, data coding, data entry, data cleaning, and data tabulating. This research data uses univariate analysis which is presented in the form of a frequency distribution table. Data processing techniques, processed using Microsoft Excel 2019 and SPSS Statistics 26.

DISCUSSION

This research was carried out from secondary data samples taken from secondary data from the results of the reactive Anti HCV TTI examination in 2020 – 2021. This research was conducted at BDU of Indonesian Red Cross Surakarta City in the Blood Testing Laboratory. The data obtained was then divided into several categories, including: Anti-HCV examination based on reactive and non-reactive, age range, blood type & Rhesus and gender.

The following is a discussion of the results of the Anti-HCV TTI examination from several characteristics:

1. Based on Reactive and Non-Reactive Anti-HCV Examination Results 2020 – 2021

   From the TTI examination data for Reactive and Non-Reactive Anti-HCV at BDU of Indonesian Red Cross Surakarta City, it was found that the number of blood donors who were Anti-HCV reactive was 42 donors, in 2020 there were 16 and in 2021 there were 26, and there were 152,534 blood donors who were non-Anti-reactive. -HCV, namely in 2020 as many as 73,973 and in 2021 as many as 78,561.

Table 1
Results of Reactive Anti-HCV Examination in 2020 – 2021

Year	2020	Percentage	2021	Percentage
Reactive	16	0.02%	26	0.03%
Non reactive	73,973	99.98%	78,561	99.97%
Total	73,989		78,587	100.00%

Sources : BDU of Indonesian Red Cross Surakarta City in 2020-2021)

2. Reactive Anti-HCV Examination Results Based on Gender

   From data from the TTI Anti-HCV Reactive examination results at BDU of Indonesian Red Cross Surakarta City in 2020 - 2021, there were 42 donors. Based on gender, the most common gender is male, with a percentage of 38 (90%). From the data above, the most reactive donors are 38 male (90%), and 4 (10%) female. Hepatitis C infection occurs in male . This is similar to Abebe's (2020) research report, in his research the highest prevalence of hepatitis C was found in male donors with a prevalence of 1.84% compared

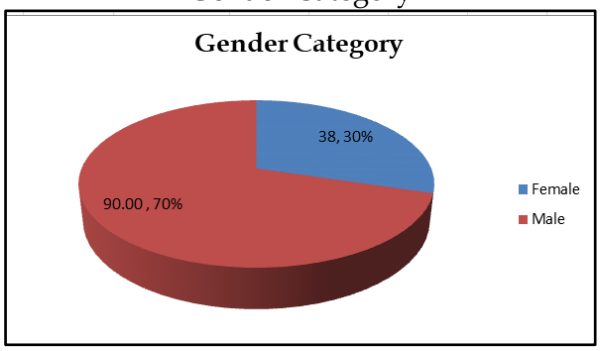
to female donors, because female are rarely able to meet the requirements for blood donation, such as menstrual problems, pregnancy and breastfeeding are not allowed. donors, so not much data on female donors was obtained (Wulandari, 2016). The high rate of Anti-HCV disease is due to a lack of socialization regarding the dangers of infections transmitted through blood transfusions, one of which is regarding the dangers of Hepatitis C infection and urging the public to avoid activities that pose a risk of transmitting Hepatitis C.

Table 2
Gender Category

Gender	Frequency	Percentage (%)
Male	38	90
Female	4	10
Total	42	100

Sources : BDU of Indonesian Red Cross Surakarta City in 2020 - 2021

Figure 1
Gender Category



Sources : BDU of Indonesian Red Cross Surakarta City in 2020 - 2021

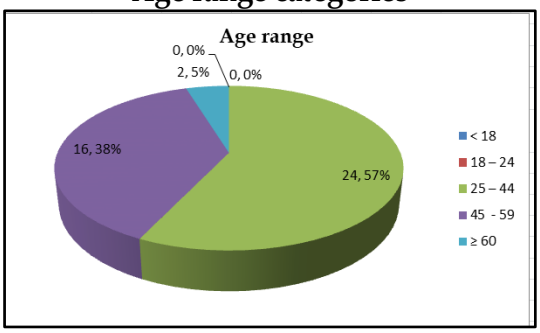
3. Presentation of Data Based on Age Range Categories
   From the data from the reactive Anti-HCV TTI examination results at BDU of Indonesian Red Cross Surakarta City in 2020 - 2021, there were 42 donors. Based on the age range, the largest number is 25-44 years old, with a percentage of 24 (57%). The high rate of Anti-HCV infection in adults is due to being physically healthier and easier to be exposed to the virus. In adulthood, they are usually more productive and susceptible to carrying out activities that pose a risk of transmitting Anti-HCV infection and having casual sex (Handojo, 2014). Anti-HCV disease is an infectious disease that is a public health problem. Until now there is no vaccination for this virus, but efforts to prevent risk factors for transmission can be done, namely by health promotion in the form of education regarding clean and healthy living behavior.

Table 3
Age Range Category

Age (years old)	Frequency	Percentage (%)
< 18	0	0
18 – 24	0	0
25 – 44	24	57
45 - 59	16	38
≥ 60	2	5
Total	144	100.00

Sources : BDU of Indonesian Red Cross Surakarta City in 2020 - 2021

Figure 2
Age range categories



Sources : BDU of Indonesian Red Cross Surakarta City in 2020 - 2021

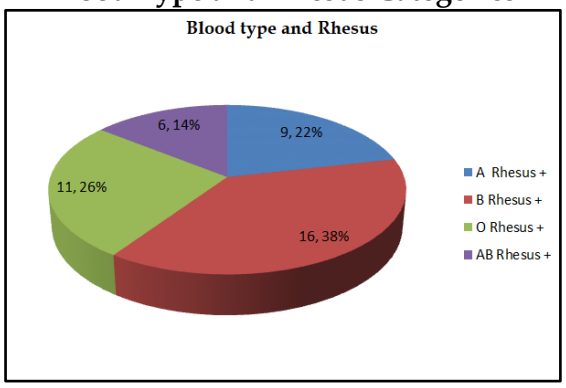
4. Presentation of data based on Blood Type and Rhesus
   From the data from the IMLTD Anti-HCV Reactive examination results at BDU of Indonesian Red Cross Surakarta City in 2020 - 2021, there were 42 donors. Based on the most common blood type, blood type B Rhesus Positive is 16 with a percentage of (38%). Blood type A was 9 (22%), blood type O was 11 (26%), and blood type AB was 6 (14%). Apart from that, blood type O is susceptible to disease and is also the blood type most frequently used for blood transfusions so the risk of transmitting the hepatitis virus is higher.

Table 3
Blood Type and Rhesus Categories

Blood Type and Rhesus	Frequency	Percentage (%)
A Rhesus +	9	21,43
B Rhesus +	16	38,09
O Rhesus +	11	26,19
AB Rhesus +	6	14,29
Total	42	100,00

Sources : BDU of Indonesian Red Cross Surakarta City in 2020 - 2021

Figure 3
Blood Type and Rhesus Categories



Sources : BDU of Indonesian Red Cross Surakarta City in 2020 - 2021

CONCLUSION

Based on research conducted at Blood Testing Laboratory in BDU of Indonesian Red Cross Surakarta, it was found that the number of donors who were Anti-HCV reactive was 42 donors in 2020-2021. Based on the results of the Reactive and Non-Reactive Anti-HCV examinations in 2020 - 2021, the number of reactive blood donors was obtained. Anti-HCV in 2020 was 16 and in 2021 there were 26. There was an increase in the number of blood donors with non-reactive Anti-HCV results from 2020 to 2021 by 6.20%. Based on gender, most blood donors are male (90%), the most common age range is 25-44 years old (57%) and based on blood type the most common is blood type B Rhesus Positive (38.09 %).

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