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Description Of Hepatitis Infection With Differential Leukocyte Count In Mataram City Hospital

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ABSTRACT

Hepatitis is an infectious disease characterized by increased levels of liver enzymes due to damage or disruption of the liver membrane. Hepatitis consists of various viruses. Hepatitis A is caused by infection with the hepatitis A virus (HAV), hepatitis B is caused by infection with the hepatitis B virus (HBV), hepatitis D is caused by infection with the hepatitis D virus (HDV), and hepatitis E is caused by infection with the hepatitis E virus (HEV). The objectives of this research are to find out the relationship between the type of Hepatitis infection and the Differential Count of leukocytes in the Mataram City Regional Hospital. The method of this research is Observational Analytical. The sampling technique in this research is the Purposive Sampling technique. The sample used in this research is the serum of Hepatitis sufferers. The population in this study is medical record data of hepatitis sufferers who underwent leukocyte type examination from January-December 2022 in Mataram City Regional Hospital, The number of samples obtained was 59 samples with types of Hepatitis A, B, and C. Data analysis used descriptive frequency. The results of this research were that the average results for the type of leukocyte Hepatitis B (HBV) mean basophils were 0.15%, eosinophils 1.89%, 75.72% neutrophils, 16.24% lymphocytes, and 6.02% monocytes. C (HCV) means basophils 0%, eosinophils 1.5%, neutrophils 82%, lymphocytes 10%, and monocytes 6%. This research concludes that there is an increase in neutrophils and a decrease in lymphocytes.

INTRODUCTION

Hepatitis is an infectious disease characterized by increased levels of liver enzymes due to damage or disruption of the liver membrane ([1]. Hepatitis consists of various viruses. Hepatitis A is caused by infection with the hepatitis A virus (HAV), hepatitis B is caused by infection with the hepatitis B virus (HBV), hepatitis D is caused by infection with the hepatitis D virus (HDV), and hepatitis E is caused by infection with the hepatitis E virus (HEV).

Based on the World Health Organization (WHO) report in 2013, 2 billion people in the world suffer from Hepatitis, 240 million people suffer from chronic Hepatitis B and 1.46 million of them die. Indonesia is a country with the second largest high endemic rate of Hepatitis B in the South East Asian Region (SEAR) after Myanmar.In West Nusa Tenggara (NTB) Province there were 2,160 cases in 2021, and then decreased to 1,996 cases in 2022.

Hepatitis is considered an infectious disease because some types of hepatitis can be transmitted from one person to another through various means. Hepatitis transmission can

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occur through the consumption of contaminated food and drinks or direct contact with sufferers[5]frequently changing sexual partners, using non-sterile needles such as when taking drugs, through tattoos, and blood transfusions.

Viral Hepatitis is diagnosed by observing clinical symptoms, performing a physical examination, and carrying out laboratory tests. Leukocytes are a complete blood test[8]. When there is inflammation in the body, the body produces more certain types of leukocytes to deal with pathogens that enter the body. Counting the types of leukocytes or Differential counting can provide more specific information about infections and disease processes.

MATERIALS/METHODS

The research design used was analytical observational which aimed to find out the description between the types of Hepatitis infection and the differential count. The sampling technique in this study was the Purposive Sampling technique. The sample used in this study was the serum of Hepatitis sufferers. The population in this study was hepatitis sufferers who underwent examination. types of leukocytes in the Mataram City Regional Hospital. The number of samples used was 59 samples with 16 types of Hepatitis A, 39 people B, and 4 people C. To ensure the population in this study, an examination was carried out on hepatitis sufferers, by taking venous blood, centrifuged for 5 minutes, and 50 micros of the patient's serum was taken and dropped into the Hepatitis examination cassette, waited for 10-15 minutes, if two lines appeared which indicated positive Hepatitis, then continued to examine the type of leukocytes using a Hematology Analyzer using whole blood that has been separated. The data collected is analyzed descriptively in the form of percentages, and then the data is presented in table form.

RESULTS

This study used 59 respondents suffering from Hepatitis who had examined the types of leukocytes (Differential Count). The data from the research results based on the type of Hepatitis Infection that carried out the Leukocyte Type (Differential Count) examination is described in Table 1. The samples used serum and whole. blood of patients who were positive for Hepatitis. The average data on the types of Hepatitis that underwent difcount examinations is described in Table 2 and the distribution of the frequency of diffcount examinations with normal, increased, and decreased values for each Hepatitis A (HAV), Hepatitis B (HBV), and Hepatitis C(HCV) is described in tables 3,4 and 5

Table 1. Characteristics of Research Subjects Based on the Type of Hepatitis Infection Who Performed a Leukocyte Count (Differential Count) Examination

No	Types of Hepatitis Infection	Amount	Percentage
1	HBV	39	66.1%
2	HAV	16	27.1%
3	HCV	4	6.7%
	Total	59	100%

Based on table 1, shows that of the 59 respondents, it is known that the largest number of subjects with the type of Hepatitis infection was Hepatitis B (HAV) type of infection, 39

people (66.1%) while hepatitis A (HAV) type was 16 people (27.1%) and Hepatitis C (HCV) type was 4 people (6.7%).

Table 2. Mean Diffcount Results in Hepatitis sufferers

NO	Types of Hepatitis	Types of Leukocytes				
		Basophils (0-1)%	Eosinophils (1-3)%	Neutrophils (50-70)%	Lymphocytes (18-42)%	Monocytes (2-11)%
1	HBV	0.15	1.89	75.72	16.23	6.02
2	HAV	0.25	2.43	75.25	16	6.06
3	HAV	0	1.5	82	10	6

Table 4.2 shows the calculation of leukocyte types in HBV sufferers with an average of 0.15% basophils, 1.89% eosinophils, 75.72% neutrophils, 16.24% lymphocytes, and 6.02% monocytes. 16% and monocytes 6.06%. In HCV sufferers with an average of 0% basophils, 1.5% eosinophils, 82% neutrophils, 10% lymphocytes, and 6% monocytes.

Table 3. Distribution of frequency of difcount examinations in Hepatitis B sufferers

Differential Count	Normal		Increase		decrease	
	Frequency	Percentage(%)	Frequency	Percentage(%)	frequency	Percentage(%)
Basophils	39	100	0	100	0	100
Eosinophils	25	64.10	4	10.26	10	25.64
Neutrophil	6	15.38	31	79.49	3	7.69
Lymphocytes	8	20.51	0	100	31	79.49
Monocytes	38	94.87	0	100	1	2.56

Based on Table 3, Hepatitis B (HBV) sufferers showed an increase in neutrophils and a decrease in lymphocytes with a frequency of 31 people (79.49%).

Table 4. Distribution of frequency of difcount examinations in Hepatitis A sufferers

Differential Count	Normal		Increase		Decrease	
	Frequency	Percentage(%)	Frequency	Percentage(%)	Frequency	Percentage(%)
Basophils	16	100	0	100	0	100
Eosinophils	9	56.25	4	25	3	18.75

Neutrophil	5	31.25	11	68.75	0	100
Lymphocytes	6	37.5	0	100	10	62.5
Monocytes	14	87.5	2	12.5	0	100

Based on Table 4, Hepatitis A (HAV) sufferers showed an increase in neutrophils with a frequency of 11 people (68.75%) and a decrease in lymphocytes with a frequency of 10 people (62.5%).

Table 5. Distribution of frequency of difcount examinations in Hepatitis C sufferers

Differential Count	Normal		Increase		decrease	
	Frequency	Percentage(%)	Frequency	Percentage(%)	Frequency	Percentage(%)
Basophils	4	100	0	0	0	0
Eosinophils	1	25	1	25	2	50
Neutrophil	0	0	4	100	0	0
Lymphocytes	0	0	0	0	4	100
Monocytes	2	50	2	50	0	0

Based on Table 5, Hepatitis C (HCV) sufferers showed an increase in neutrophils and a decrease in lymphocytes with a frequency of 4 people (100%).

DISCUSSION

The results of this study showed that the number of patients who underwent leukocyte count examination during 2022 was 59 people. Based on the type of Hepatitis infection, the largest number of subjects was Hepatitis B type (HBV) as many as 39 people (66.1%) while the Hepatitis A (HAV) type was 16 people (27.1%) and the Hepatitis C (HCV) type was 4 people (6.7%).

Based on the data in this study, for the type of Hepatitis infection, for the leukocyte type, there was an increase in neutrophils in Hepatitis B (HBV) as many as 31 people (79.49%), Hepatitis A (HAV) as many as 11 people (68.75%), and Hepatitis C (HCV) as many as 4 people (82%). Neutrophils are the most abundant type of phagocyte, usually 50-60% of all leukocytes in circulation, bone marrow produces more neutrophils during acute inflammation.[10].The presence of neutrophil cells whose function is as the body's defense system, so in acute infections there is an increase in the number of neutrophils so that the number of leukocytes increases[11]. The results of this research are also in line with the results of previous research conducted by B.Nurfajri Mentari & Zahrah, (2022), which

showed that there was an increase in neutrophils in Hepatitis B amounting to 28 people (58.33%).

The difference in the increase in neutrophils between Hepatitis C, B, and Hepatitis A is due to differences in the mechanism of infection and the body's immune response to this type of hepatitis. Severity of infection. Hepatitis C and B tend to have more severe symptoms and can cause chronic infections, while Hepatitis A has different symptoms. lighter and does not cause chronic infections. The severity of the infection can affect the level of the body's immune response, including the number of neutrophils produced. Differences in pathogenesis or the way the virus attacks and damages the liver can also affect the body's immune response. Hepatitis C and B viruses have more complex mechanisms for infecting liver cells and can cause more serious liver damage Typical sequence of serological markers in patients with HBV infection that progresses to chronicity. In patients with chronic HBV infection, HBsAg, HBeAg, and HBcAg.

Hepatitis C and B viruses can suppress the immune system, so the body responds by producing more white blood cells, including neutrophils, to fight the infection. Hepatitis A triggers an immediate immune response without significantly suppressing the immune system. Duration of Hepatitis C and B Infection tends to be chronic, while Hepatitis A is acute or short-term. The longer duration of infection in Hepatitis B can contribute to changes in the number and type of white blood cells, including neutrophils. The increase in neutrophils in Hepatitis C is higher compared to Hepatitis A and Hepatitis B. This is caused by therapy using peg-interferon. Apart from the effects due to therapy, neutropenia and leukopenia in hepatitis C patients can also be caused by hypersplenism, and autoimmune neutropenia

Lymphocyte cells are one of the immune cells that are activated if the cells are exposed to foreign compounds, antigens, or tissue damage. A decrease in the percentage of lymphocytes can be caused by the migration of lymphocytes from the blood circulation to the tissue, whereas an increase in the percentage of lymphocytes can occur if there is damage to cells in the tissue or organs of the body.[14]Based on the research results, the number of Hepatitis respondents showed a decrease in lymphocytes with the number of Hepatitis B (HBV) 31 people (79.49%), Hepatitis A (HAV)10 people (62.50%)and Hepatitis C (HCV) 4 people (100%). The results of this study are also in line with the results of previous research conducted by 50 patients had lymphocyte levels less than 25%.

One type of immune cell that becomes active when exposed to foreign substances, antigens, or tissue injury is lymphocyte cells. Migration of lymphocytes from the blood circulation to tissues can result in a decrease in the proportion of lymphocytes, while damage to organs or body tissues can cause an increase in the percentage of lymphocytes. Based on the research results, the number of respondents who experienced an increase was only 2 people (50%) suffering from Hepatitis C (HCV). The results of this study are in line with. The increase in monocytes was 1 sample (14.29%).

Eosinophils are leukocytes that circulate and persist in tissues, eosinophils strongly induce inflammation in various diseases. Based on the research results, the number of respondents who experienced an increase in neutrophils in HBV sufferers was 4 people (10.25%), HAV was 4 people (25%) and HCV was 1 person (2%). There was a decrease in

HBV sufferers by 10 people (25.64%), HAV by as many as 3 people (18.75%), and HCV by as many as 2 people (40%). An increase in eosinophils is called eosinophilia. This research is in line (Suciani et al., 2018) with increased eosinophils in 3 samples (42.86%).

CONCLUSIONS

Based on the research results, it can be concluded that in all types of Hepatitis A, Hepatitis B, and Hepatitis C, there is an increase in neutrophils and a decrease in lymphocytes.

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