

OVERVIEW OF BLOOD ENTERPRISES (ESR) USING THE WESTERGREN METHOD IN TUBERCULOSIS SUSPECTS IN THE REGION OF THE KABILA PUSKESMAS, 2020

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ABSTRACT

Tuberculosis is a disease caused by the bacteria *Mycobacterium tuberculosis*. Symptoms are cough for 2-3 weeks or more, fever, shortness of breath, decreased appetite according to the history by the doctor. The supporting diagnosis in this study is the Westergren method ESR examination. The purpose of this study was to determine the description of the sedimentation rate (ESR) using the Westergren method on tuberculosis suspects in the Kabila Health Center in 2020.

This type of research is descriptive with a quantitative approach. The population in this study were 86 people with a total of 23 samples using the sampling technique by accidental sampling. The results of the characteristic research on suspected tuberculosis were characteristic age, the highest value was found at productive age, namely 45-64 years. The highest gender characteristics were women, the highest occupational characteristics were an IRT and the village characteristics were Poowo village.

The results of the examination with a total of 23 samples, there were 20 samples with an abnormal result of 87.0% and 3 samples with a normal result of 13.0%. The community is expected to pay attention to the dangers posed by tuberculosis, to Kabila Health Center to provide a supporting examination tool for TB suspects, namely the Westergren ESR method recommended by ICSH, for further researchers to carry out ESR examinations using the autometric method. 0% and 3 samples with a normal percentage of 13.0%. The community is expected to pay attention to the dangers posed by tuberculosis, to Kabila Health Center to provide a supporting examination tool for TB suspects, namely the Westergren ESR method recommended by ICSH, for further researchers to carry out ESR examinations using the autometric method. 0% and 3 samples with a normal percentage of 13.0%. The community is expected to pay attention to the dangers posed by tuberculosis, to Kabila Health Center to provide a supporting examination tool for TB suspects, namely the Westergren ESR method recommended by ICSH, for further researchers to carry out ESR examinations using the autometric method.

Keywords: suspect, tuberculosis, sedimentation rate (ESR)

INTRODUCTION

Tuberculosis is a disease that can be directly transmitted by a germ known as

Mycobacterium tuberculosis. Most of the TB germs attack the lungs, but can also affect other organs [5]. *Mycobacterium*

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tuberculosis is an obligate aerobic organism that requires oxygen so that it can grow[6].

Supporting examinations in the diagnosis of tuberculosis can be carried out by several examinations including physical examinations, radiological examinations, and examinations in the laboratory. One of the examinations carried out in the laboratory is a routine blood test, including a blood sedimentation rate examination called an ESR. The ESR examination is important because it is used to support the diagnosis of Mycobacterium tuberculosis infection in pulmonary TB disease[9].

The ESR (sedimentation rate) examination is carried out by inserting the blood fluid into a special tube perpendicularly and leaving it for 1 hour, the morered blood cells that settle, the higher the ESR number [4]. The use of the Westergren method is recommended by the International Committee for Standardization in Hematology (ICSH) [4]. The ESR examination in the support of pulmonary diagnosis shows that pulmonary TB infection occurs in an inflammatory process, where in the inflammatory process the levels of fibrinogen and plasma globulin associated with an acute phase reaction are increased, causing the ESR level to increase [8].

The red blood cells or erythrocytes that will be used in this ESR examination are red blood cells that come out of the blood vessels which will immediately coagulate (clotting). Therefore, it is necessary to add substances to prevent blood coagulation known as anticoagulants. The type of anticoagulant that is often used is ethylene diamine tetra acetic acid (EDTA), which works by binding to calcium needed for the coagulation process[3].

Based on previous research by Hasnawati in 2018, with the aim of his research to find out the effect of

Mycobacterium tuberculosis infection on the ESR value of pulmonary TB patients at the Makassar Community Lung Health Center and the results of his research that of the 30 samples examined showed an increase in the ESR value according to the degree of gradation (positive level) experienced by these patients, the higher the positive BTA level, the higher the ESR value.

RESEARCH METHODS

The type and design used in this research is descriptive with a quantitative approach. In this study, researchers will describe the results of ESR examinations for TB suspects in the Kabila Health Center Area in 2020. Here's an example of writing an image.

Sampling location, conducted in the working area of the Kabila Health Center. Sampling locations were carried out in the working area of the Kabila Community Health Center. The population in this study were those at Kabila Public Health Center, amounting to 86 with a total of 23 samples calculated based on the known population estimation formula.

The results that have been obtained for age characteristics, the highest value is in the productive age, namely 45-64 years, the highest gender characteristics are women, the highest job characteristics are a housekeeper and the village characteristics are located in Poowo village. And on the results of the examination, there were 20 abnormal samples with a percentage of 87.0% and there were 3 normal samples with a percentage of 13.0%.

The variables in this study consisted of the dependent variable (bound) and the independent variable (free). Those acting as the dependent variable were TB suspects. As well as acting in the independent variable in this study is the ESR examination.

The instruments in this study were the tools used in this study including EDTA tubes, tube racks, tourniquit, 3 ml disposables, westergren pipettes, westergren racks, ballpipets, micropipettes, yellow tip micropipettes, personal protective equipment (PPE). The materials used in this study were 70% alcohol cotton, dry cotton, venous blood, EDTA anticoagulant, 0.9% NaCl. Then the venous blood is drawn according to the procedure, the venous blood is collected in a vacuum tube containing the anticoagulant and then homogenized. Then homogenize it with 0.9% NaCl solution, after that put it into the Westergren tube, and place the tube on the Westergren tube, after exactly 1 hour reading the results in mm / hour.

The sampling technique in this study is *Accidental Sampling*, where samples are taken by chance or taken directly by the researcher.

The operational definition in this study is

- a. Suspect Pulmonary Tuberculosis, is a suspected TB patient with main symptoms, such as cough with phlegm for 2-3 weeks or more or according to the history given by the doctor.
- b. *Westergren*, is a method of examination recommended by the International Committee for Standardization in Hematology (ICSH), which can calculate large and higher reading scales, 300 mm in length and 2 1/2 mm in diameter.

Table 2. *Distribution of Demographic Characteristics by Gender in Suspect Pulmonary TB*

Demographic Characteristics	Amount	Percentage (%)	Normal	Abnormal
Gender				
a. Male	7	30.4	1	6
b. Women	16	69.6	2	14
Total	23	100.0	3	20

Source: Primary Data, 2020

- a. Sedimentation rate (ESR), is an examination used as a support to examine suspected TB with several phases, namely the aggregation phase, the rouleaux phase and the depositional phase. Intervals: men <10 mm / hour, women: <15 mm / hour
- b. Inflammation is the body's mechanism to protect itself from infection with foreign microorganisms, such as the bacteria *Mycobacterium tuberculosis*. The occurrence of inflammation on the ESR is indicated by an abnormal value. Nominal: male:> 10 mm / hour female:> 15 mm / hour.

RESEARCH RESULT

Table 1. *Domographic Distribution by*

Demographic Characteristics	Amount	Percentage (%)	Normal	Abnormal
Age				
a. 25-34 Years	4	17.4	-	4
b. 35-44 Years	3	13.0	-	3
c. 45-54 Years	6	26.1	1	5
d. 55-64 Years	6	26.1	2	4
e. > 65 Years	4	17.4	-	4
Total	223	100.0	3	20

Source: Primary Data, 2020

Table 1.shows the results of the ESR examination on the age characteristics of TB suspects shown based on the highest to lowest percentages, namely at the age of 45–54 years and 55–64 years with a percentage of 26.1%, then at the age of 25-34 years And> 65 years with a percentage of 17.4% and at the age of 35-44 years with a percentage of 13.0%.

Table 2 shows the results of the ESR examination of the sex characteristics of TB suspects, the results were dominated by women, namely 69.6%, while the male group was 30.4%.

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Table 3. *Distribution of Demographic Characteristics by Occupation in Pulmonary TB Suspects*

Demographic Characteristics	Amount	Percentage (%)	Normal	Abnormal
Profession				
a. Has no job	4	14.7	1	3
b. IRT	9	39.1	2	7
c. Civil servants	3	13.0	-	3
d. Honorary	2	8.7	-	2
e. entrepreneur	4	17.4	-	4
f. Farmer	1	4.3	-	1
Total	23	100.0	3	23

Source: Primary Data, 2020

Regarding Table 3 in terms of employment, the results obtained were dominated by IRT, namely 39.1%, unemployment namely 17.4%, self-employed 17.4%, civil servants 13.0%, honorary 8.7% and farmers namely 4, 3.

Table 4. *Distribution of Demographic Characteristics by Village in Suspect Pulmonary TB*

Demographic Characteristics	Amount	Percentage (%)	Normal	Abnormal
Village				
a. Poowo	10	43.5	-	10
b. Padengo	8	34.8	2	6
c. Uluhuta	2	8.7	-	2
d. Tumbihe	2	8.7	1	1
e. South Toto	1	4.3	-	1
Total	23	100.0	3	20

Source: Primary Data, 2020

Table 4 also shows that are based on the address of residence, TB suspects are dominated by Poowo Village, namely 43.5%, Padengo Village which is 34.8%, Uluhuuta and Tumbihe Villages namely 8.7% and in Toto Selatan Village namely 4.3%.

Table 5. *ESR examination results on pulmonary tuberculosis suspects*

Examination Method	Result	Frequency	Percentage (%)	Information
Westergren LED	Normal	3	13.0	There is no inflammation
	Abnormal	20	87.0	Inflammation occurs
Total		23	100.0	

Source: Primary Data, 2020

The results of the examination aimed at table 5 showed an increase in the ESR value of the TB suspect samples which were dominated by Abnormal results, namely 87% with a frequency of 20 samples in the category of inflammation while in the normal study results and 13 % with a frequency of 3 samples with the non-inflammatory category.

DISCUSSION

Based on the results of research on ESR using the Westergren method on 23 samples carried out at the UPTD Regional Health Laboratory Center, 13.0% were obtained with normal results against a frequency of 3 samples and 87.0% with abnormal results on a frequency of 20 samples . From the results obtained, 87.0% indicated inflammation in the body, but an increase in ESR is not always found in TB patients, but basically this increase can occur in other diseases, so that the ESR value is not used as an enforcer for diagnosing a disease, but is used as a supporting examination.

The results of the study on the characteristics in terms of age obtained from the vulnerable age 45-54 years and 55-64 years old showed the highest results, namely 26.1%. The total vulnerable age group at 45-64 years is 52.2% of patients who are in the productive age group. Productive age is the age when someone is at the stage of producing something / working both for himself and for others. In this case, age vulnerability can affect health status, social status and economy.

According to research, it shows that the male sex is more dominant with the bacteria *Mycobacterium tuberculosis*, namely the total number of men as many as 19 samples with a presentation of 63.4%, while women are 11 samples with a presentation of 36.6%. That matter.

due to several factors, including because men often consume alcohol and cigarettes which allow the damage to occur so that when infected by the bacteria *Mycobacterium tuberculosis* the progressivity of TB becomes active. Where the percentage value of women is higher, namely 52.2% with 13 samples compared to men with a percentage of 47.8% to 11 samples, due to factors including red blood cell factors, plasma components and technical factors [2]

Difference where the female gender is more dominant than the male gender, namely the acquisition of results from the female group, namely 69.6% in frequency 16 while men that is 30.4% in frequency 7. In a study that was conducted on 23 samples, the cause of women was more dominant due to several factors, namely, as a patient with diabetes mellitus, other than that other causative factors were taking certain drugs such as metformin, simvastatin., methyldopa (aldomet) and the like because the sample used in this study was more dominant in the Chronic Disease Treatment (Prolanis) sample group that one of the factors that caused the ESR to increase was in patients taking.

CONCLUSION

ESR examination can be used as a supporting examination for patients with suspected TB. Regarding the age characteristics, the highest score was found in the productive age, namely 45-64 years, the highest gender characteristics were women, the highest occupational characteristics were a housekeeper and the village characteristics were located in Poowo village.

The results that have been obtained in 23 samples of Suspek TB, namely there are 20 abnormal samples with a percentage of 87.0% and there are 3

Based on the results of the characteristic research in terms of work, it was found that the housewives group (IRT) was more dominant, namely 39.1% with a frequency of 9. In this case the main effect of the increase in the value of ESRs was the IRT group, due to the economic situation with the use of firewood. as a basic source of daily life needs, especially for households for cooking purposes. Exposure to kitchen smoke pollution, one of which can cause concern because of pollutant emissions that produce air pollutants which can damage the lungs so that when infected by *Mycobacterium tuberculosis*, the lung organs have previously been disturbed by pollutant emissions. caused by smoke from firewood, making it easier to be infected with the bacteria *Mycobacterium tuberculosis*. Total number of Indonesian households (RT), as many as 47. 71% of households still use firewood, which are generally in rural areas. The results of the research on the characteristics of the village, the highest score was obtained in the village of Poowo, namely 43.5 in a frequency of 10 samples [2].

normal samples with a percentage of 13.0%.

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