

PROFIL LIMFOSIT PADA PASIEN TUBERKULOSIS (TB) PARU KASUS BARU DI KOTA SEMARANG

Profile Of Lymphocytes In New Tuberculosis (TB) Patients In Semarang City

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Abstrak

Background. Respon imun alami terhadap bakteri intraseluler adalah fagositosis. Sel makrofag berkemampuan fagositosis dalam respon alamiah dan berperan dalam menyajikan antigen kepada limfosit dalam respon imun spesifik. Jumlah total limfosit berkaitan dengan kejadian kematian pasien TB di rumah sakit. Penelitian ini bertujuan untuk mengetahui bagaimana profil limfosit pada pasien TB paru kasus baru di kota semarang tahun 2020.

Metode. Penelitian ini menggunakan desain penelitian deskriptif analitik. Populasi dalam penelitian ini adalah pasien TB paru kasus baru di Balikesmas Semarang tahun 2020. Sampel dalam penelitian ini adalah pasien TB paru kasus baru di Balikesmas Semarang dari bulan September sampai Oktober 2020.

Hasil. Hasil penelitian menunjukkan kasus baru TB paru terbanyak pada jenis kelamin laki-laki (59%), dan berdasarkan usia paling banyak di usia produktif (87,8%), dan profil limfosit relatif responden 78% mengalami limfopenia relatif, 19,5% responden normal dan 2,4% responden mengalami limfositosis relatif.

Kesimpulan. Secara keseluruhan dapat disimpulkan bahwa profil pasien mengalami limfopenia terdapat 14,63% dan limfopenia relatif 78%.

Kata Kunci:

Tuberkulosis paru, kasus baru, profil limfosit

Keywords :

Pulmonary tuberculosis, new cases, lymphocyte profile

Abstract

Background. The body's form of defense or natural immune response against intracellular bacteria is phagocytosis. Cells that are capable of phagocytosing macrophages in natural responses and play a role in presenting antigens to lymphocytes in specific immune responses. The number of lymphocytes associated with the incidence of death in TB patients in hospital. This study aims to determine how the lymphocyte profile in pulmonary TB patients with new cases in the city of Semarang in 2020.

Method. This study uses a descriptive analytic research design. The population in this study were new cases of pulmonary TB patients at the Semarang Health Center in 2020. The sample in this study were new cases of pulmonary TB patients at the Semarang Health Center from September to October 2020.

Results. The results showed that the most new cases of pulmonary TB were male (59%), and based on age the most were productive age (87.8%), and the lymphocyte profile of 78% of respondents had relative lymphopenia, 19.5% of respondents were normal and 2.4% of respondents experienced relative lymphocytosis.

Conclusion. Overall, it can be said that the profile of patients with lymphopenia is 14.63% and relative lymphopenia is 78%.



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INTRODUCTION

Tuberculosis (TB) infection is one of the top 10 causes of death in the world. Millions of people each year are infected with Tuberculosis. According to the World Health Organization (WHO) in 2017, TB caused about 1.3 million deaths. The number of new TB cases in Indonesia was 420,994 cases in 2017 (data as of 17 May 2018). Based on gender, the number of new TB cases in 2017 in males was 1.4 times greater than in

females (Data and Information Center of the Ministry of Health of the Republic of Indonesia, 2018). The number of TB cases in Central Java in 2018 reached 143.9 per 100,000 population, this shows an increase from 2017, namely 132.9 per 100,000 population. The districts / cities with the highest number of TB cases, namely the city of Tegal and the city of Semarang, were in 10th place, namely 191.2 per 100,000 population (Central Java Health Profile, 2018).

Examination of the lymphocyte count can be used to support the diagnosis of TB infection, besides that, it can also be used to eliminate differential diagnosis, see the patient's immune response and treatment response, and see disease progression (Iqbal et al, 2014). Mirsaedi et al (2003) in their study concluded that a state of lymphocytopenia can be used as a measure to determine the risk of death in pulmonary TB patients. In addition, Okamura et al (2013) stated that the total number of lymphocytes was related to the incidence of death of TB patients in the hospital. Therefore, the researcher wanted to see how the lymphocyte profile in new cases of pulmonary TB patients in Semarang City.

METHOD

This study used a descriptive research design. Patients who have been declared pulmonary tuberculosis will be asked to fill out an informed consent form. Officers who provide explanations and approaches to prospective respondent patients are researchers and a team of enumerators. Blood sampling, complete blood count (lymphocyte) and the making of peripheral blood smears are carried out by Balkesmas laboratory staff. The staining and examination of the peripheral blood smear were carried out at the Laboratory of the Health Analyst Department of the Semarang Health Polytechnic by the research team.

RESULT AND DISCUSSION

The results of this study indicate that the respondents with male gender are 24 people and 17 are female. The following is a table of the distribution of respondents based on gender.

Tabel I. Distribution of frequency of new cases of pulmonary TB patients in Balkesmas Semarang Region by Gender.

Gender	Frequence	(%)
L	24	59
P	17	41

Total	41	100
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Based on table I, it can be seen that the number of pulmonary TB patients with male gender (59%) is more than female (41%). Respondents of this study consisted of ages 14 to 74 years with the mean age of the respondents was 42.9 years. Respondents were divided into productive age groups (14-64 years) and non-productive age groups (> 64 years).

Tabel II. Distribution of frequency of new cases of pulmonary TB patients in Balkesmas Semarang Region based on age.

Age	Frequence	(%)
14 - 64	36	87,8
> 64	5	12,2
Total	41	100

Based on table II, it can be seen that the number of respondents in the productive age group is more than the non-productive age group. The leukocyte profile in this study was divided into groups based on the number of leukocytes with the leukopenia group (<5,000 / mm3), the normal group (5,000 - 10,000 / mm3 and the leukocytosis group (> 10,000 / mm3). This leukocyte profile needs to be known in order to calculate the absolute lymphocyte value.

Tabel III. Frequency distribution of new cases of pulmonary TB patients in Balkesmas Semarang Region based on the number of leukocytes.

Leukosit	Frequence	Percentage (%)
<5.000 /mm3	1	2,44
5.000 - 10.000 /mm3	22	53,66
> 10.000 /mm3	18	44,0

Based on table III, it can be seen that respondents who experienced leukocytosis were 44%, and normal ones were 53.66%, while those who experienced leukocytosis were only 1 respondent (2.44%). The division of the respondent group based on the relative lymphocyte count consisted of the relative lymphocyte group (<20%), the normal group (20 - 40%), and the relative lymphocytosis group (> 40%).

Tabel IV. Frequency distribution of new cases of pulmonary TB patients in Balkesmas Semarang Region based on relative lymphocyte counts.

Limfosit relatif	Frequence	Persentase (%)
<20 %	32	78,0
20 - 40%	8	19,5
>40 %	1	2,4

Based on table IV, it can be seen that there are 78% of respondents experiencing relative lymphocytosis, 19.5% of normal respondents and 2.4% of respondents experiencing relative lymphocytosis. The absolute lymphocyte count was calculated by multiplying the relative lymphocyte count (%) by the leucocyte count. In this study, the group of respondents based on the absolute lymphocyte count consisted of the lymphocytic group (<1,000 mm³), the normal group (1000 - 40,000 / mm³) and the lymphocytosis group (> 4,000 / mm³).

Tabel V. Frequency distribution of new cases of pulmonary TB patients in Balkesmas Semarang area based on absolute lymphocyte count.

Limfosit absolut	Frequence	Persentase (%)
< 1.000 mm ³	6	78,0
1000 - 40.000/mm ³	35	19,5
> 4.000/mm ³	0	2,4

From table V, it can be seen that there were 14.63% of respondents who experienced lymphocytosis, and 85.37% of respondents with normal conditions, while those who had lymphocytosis were absent.

Based on table IV, it is known that pulmonary TB affects more men than women, this is in accordance with research conducted by Farrah Azizah Ahzahra (2017) in South Tangerang, where out of 90 respondents, 58 respondents were male. In addition, research by Dian Wahyu Laily et al (2015) in Manado also shows that TB affects more men, from 196 respondents 55.1% percent are male. According to WHO, the large number of pulmonary TB incidents in men is because men have higher mobility than women so that the possibility of being exposed to TB is

greater, besides smoking and consuming alcohol can reduce the body's immunity so that it is more at risk for pulmonary TB infection (WHO , 2002).

In this study, respondents of productive age were more exposed to pulmonary TB. This is in line with research conducted in Lubuk Alung by Susilayanti (2014) which states that pulmonary TB occurs more frequently in the productive age group.

Tuberculosis when it occurs at productive age is thought to have a relationship with the level of activity and work as a productive workforce which allows it to easily contract TB germs from patients with positive smear (Sahal, et al, 2014). So that high mobility, dense work environment and interaction with large crowds can increase the risk of pulmonary TB. Respondents in this study mostly experienced relative lymphopenia. This is in accordance with the research of Ahzahra (2017) and Sahal et al (2014). In Ahzahra's study, there were 60 out of 90 respondents who experienced relative lymphopenia, while in Sahal's study, of the 41 respondents there were 35 who had relative lymphopenia. Relative lymphopenia can occur due to a shift in the leucocyte count to the left (shift to the left), namely an increase in immature neutrophil cells and can also occur due to an increase in other types of leukocyte cells.

Neutrophil cells play a role in the pathogenesis process as immune cells that first respond to inflammatory stimuli by means of these neutrophils that will move to the infected area, so that lymphocytes cannot play an active role and move to the infected area. After neutrophils work on the infected area, they are replaced by lymphocytes. It is possible that lymphopenia is caused by the movement of lymphocyte cells to infected areas in the lungs so that there are only a few lymphocytes in the peripheral blood and indicate an active disease course (Sahal et al, 2014).

In this study, most of the respondents had normal absolute lymphocyte values. According to Davoudi et

al (2008) the decrease in lymphocytes can return to normal after 1 month of antituberculosis therapy. Respondents with normal lymphocyte counts may also occur because the patient has mild pulmonary TB with no decrease in albumin, hematocrit and body mass index levels and the absence of a broad radiological picture of pulmonary TB. So that lymphopenia and lymphocytosis do not always occur in every patient with pulmonary TB.

CONCLUSION

Based on the results of research conducted on 41 respondents with new cases of pulmonary TB in Balkesmas Semarang Region, the following conclusions can be drawn:

1. Respondents who experienced relative lymphocytosis were as many as 78% of respondents, 19.5% of normal respondents and 2.4% of respondents experiencing relative lymphocytosis.
2. Respondents who experienced lymphocytosis were 14.63%, and respondents with a normal condition were 85.37% while those who experienced lymphocytosis were absent.
3. The relative lymphocyte mean of respondents was 15.95%.
4. The absolute lymphocyte mean of the respondents was 1.467 / mm³.

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