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Overview of Routine Blood Test Results in Rheumatoid Arthritis Patients in Ciamis Regency

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ABSTRACT

Background & Objectives: Based on data from the Ciamis District Health Service Profile (2022), rheumatoid arthritis (RA) ranks 6th out of the 10 most common diseases at community health centers, with 16,195 cases. Systemic inflammation in RA can affect blood cell productivity. This has the potential to cause blood abnormalities, which can lead to diseases such as anemia, leukemia, or blood clotting problems. Routine blood tests are performed as a screening test to determine blood values in RA patients. The purpose of this study was to determine the results of routine blood tests in RA patients in Ciamis Regency.
Method: This study used a descriptive method with total sampling technique. The examination was conducted on RA patients in Ciamis Regency in May 2024 with a sample size of 20 respondents. The study used secondary data that was processed into diagrams and then explained narratively. The study used a hematology analyzer located in the hematology laboratory of Ciamis Regional General Hospital.
Results: This study found that the percentage of normal blood values for erythrocyte parameters was 70%, hemoglobin was 70%, hematocrit was 70%, average erythrocyte index was normal at 90%, leukocytes were 95%, average leukocyte types were normal at 80%, and thrombocytes were 90%. Low values were found in the erythrocyte (30%), hemoglobin (30%), hematocrit (30%), MCV (25%), MCH (10%), RDW SD (10%), and lymphocyte (11%) parameters. Meanwhile, high values were found in the parameters of white blood cells (10%), lymphocytes (8%), monocytes (15%), neutrophils (10%), eosinophils (40%), basophils (5%), and platelets (10%).
Conclusion: It can be concluded that the values for erythrocytes, hemoglobin, hematocrit, erythrocyte indices, leukocytes, leukocyte types, and platelets were generally within the normal range.

Keywords: Rheumatoid arthritis, Inflammation, Routine blood tests.

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INTRODUCTION

The World Health Organization (WHO) in 2019 stated that 18 million people worldwide suffer from RA, with approximately 70% of RA sufferers being women and 55% being over 55 years of age. According to the Indonesian Ministry of Health in 2019, the incidence of RA has increased annually from 2015 to 2019, with the number of cases rising by 30,320, from 72,675 cases to 102,995 cases. Based on the results of the 2018 Riskesdas survey, the prevalence of rheumatoid arthritis in West Java was 41.7%. According to the 2022 health service profile data for Ciamis Regency, RA is among the top 10 most common diseases at community health centers, ranking 6th with 16,195 cases (Ciamis Regency Health Office, 2022).

Rheumatoid arthritis (RA) is an immune disorder that causes inflammation in the joints. The inflammation can cause excessive pain for the patient and hinder their daily activities, which can affect their quality of life and increase mortality rates (Agustin, 2019). The incidence of RA varies between populations. RA can affect people of all ages. However, it affects women nearly three times more often than men. The cause of RA is not yet clearly understood. The main cause is thought to be an autoimmune disease closely related to genetic and environmental factors. These factors trigger an immune response that begins years before clinical symptoms appear. In addition, age also plays a role in RA. However, there is no statistical difference in the number of cases between women and men over the age of 70. The highest incidence rate occurs in the 50 to 54 age group (Hidayat, 2021).

RA is a chronic disease that can cause complications over a long period of time. Bone damage in RA patients can affect blood cell productivity. This can potentially cause blood disorders in patients, leading to diseases such as anemia, leukemia, blood clotting problems, or diseases related to decreased immunity in the body (Savola, 2018). As health professionals, medical laboratory technologists (MLTs) play a role in diagnosing RA through laboratory tests, including erythrocyte sedimentation rate (ESR), rheumatoid factor (RF), C-reactive protein (CRP), joint fluid examination, and radiological examination. Routine blood tests are very important to determine the overall health of RA patients and to identify the possibility of other diseases, especially those closely related to blood, such as anemia, leukemia, infection, blood clotting disorders, and other immune system diseases (Sandra & Anang, 2018).

Previous research conducted by Widiastuti examined the number of ESR and leukocytes in suspected RA patients. The results from 40 samples showed that 82.5% experienced an increase and 95% experienced an increase in ESR. Based on the above results, the researcher was interested in conducting research on the results of complete blood tests in RA patients in Ciamis Regency.

OBJECTIVE

To determine the results of routine blood tests in patients with rheumatoid arthritis in Ciamis Regency.

METHOD

This study used a descriptive research design. It involved 31 RA patients in Ciamis Regency from the working areas of the Ciamis, Cijeungjing, and Handapherang Community Health Centers. Total sampling was used to collect samples. A total of 20 samples were obtained. This study used secondary data. The instrument used was a Hematology Analyzer. The study was conducted in May 2024 at the Ciamis Regional General Hospital Laboratory.

RESULTS

The respondents in this study were RA patients in Ciamis Regency. The distribution of respondents based on gender and age can be seen in Table 1.

TABLE 1. Distribution of RA Patients based on Gender and Age

Varible	N	%
Gender		
Male	6	30
Female	14	70
Age		
<50	7	35
>50	13	65
Total	**20**	**100**

Routine blood tests are performed automatically using a hematology analyzer. Before testing the specimen, a control test is performed to ensure that the control values are within the required range. After performing a complete blood test on RA patients, the following results were obtained:

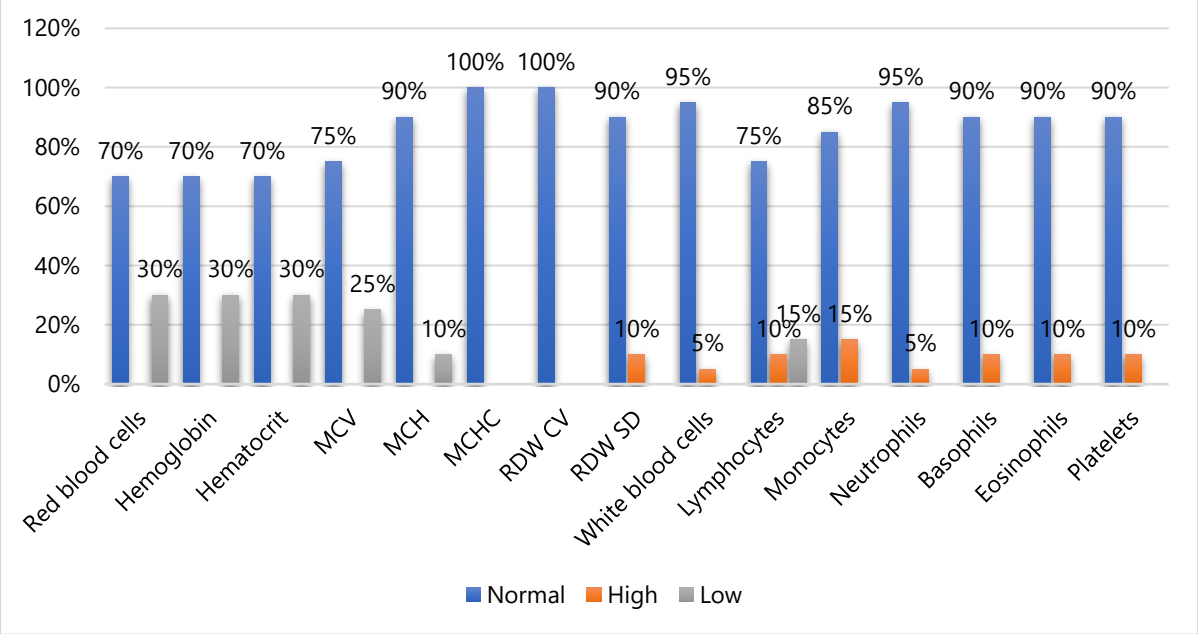

FIGURE 1. Routine Blood Test Results

DISCUSSION

Table 1 shows the distribution of RA patients based on gender, with 6 male patients (30%) and 14 female patients (70%). It can be seen that the number of female patients is higher than that of male patients, because gender differences have a significant effect on RA, where females are almost three times more likely to experience RA than males. This is due to hormonal differences, where females have estrogen hormones. Various studies have suggested that these hormones can trigger immune system disorders (Hidayat, 2021).

The distribution of RA patients based on age group was 7 people (35%) under 50 years old and 13 people (65%) over 50 years old. It can be seen that the age group over 50 years old is more numerous than those under 50 years old, due to the fact that age is an important factor

in RA. In the elderly age group, there will be a tendency for physiological changes and a decline in the immune system (Hidayat, 2021).

The results of the erythrocyte, hemoglobin, and hematocrit parameter tests showed normal values in 14 people (70%) and low values in 6 people (30%). Low results can occur because the immune system not only attacks the joints but can also attack other body tissues such as cartilage and blood vessels. In addition, the use of NSAIDs or DMARDs can cause gastric mucosal erosion. Thus, the pain that arises can affect the appetite of RA patients. In this condition, some RA patients may experience anemia (Laniyati, 2020).

The results of the erythrocyte index examination showed that 15 people (75%) had normal MCV values, which fall into the normocytic category (normal erythrocyte size). Five people (25%) had low MCV values, which are referred to as microcytic (small erythrocyte size). Normal MCH values were found in 18 people (90%), indicating that the average hemoglobin value in red blood cells was normal, also known as normochromic. Low MCH values were found in 2 people (10%), also known as hypochromic. The MCHC value was normal in 20 people (100%), meaning that the average hemoglobin level in red blood cells was normal (Laniyati, 2020).

The RDW (red blood cell distribution width) test measures the variation in the size and volume of red blood cells. The RDW test is used to aid in the diagnosis of anemia, chronic diseases, and nutritional status. The results obtained for the RDW CV were normal in 20 people (100%). The RDW SD test results were normal in 18 people (90%) and low in 2 people (10%). Low RDW SD values can be caused by bone marrow disorders. RA patients tend to experience bone erosion due to immune disorders, which affects the bone marrow's ability to produce red blood cells (Savola, 2018).

The leukocyte test results showed normal values (90%) and high values (10%). The study found high leukocyte values, which could be due to the complete blood count being performed when the patient was experiencing joint inflammation, so leukocyte values tended to be high during the inflammatory process. Meanwhile, normal leukocyte values were found because when the complete blood count was performed, RA patients had been undergoing regular treatment so that the joint inflammation they had previously experienced could be cured within a short period of time. Therefore, RA patients tend to have normal leukocyte values if they undergo regular treatment, so leukocyte values are likely to change.

Lymphocytes are part of white blood cells that play a role in maintaining the body's immune system. The results of the study found normal values in 15 people (81%), low values in 3 people (11%), and high values in 2 people (8%). High lymphocyte counts can be found in patients with chronic diseases such as RA. Abnormal immune responses in RA patients can cause inflammation in the joints, leading to high lymphocyte counts. Low lymphocyte counts are generally not specific and can be caused by an abnormal decrease in cells used in immune disorders (Aliviameita, 2019).

Monocytes are a type of white blood cell that plays a role in maintaining the body's immunity. The results of the study showed that 17 people (85%) had normal values, while 3 people (15%) had high values. The results of the neutrophil examination showed that 18 people (90%) had normal values, while 2 people (10%) had high values. Neutrophil values can be used as an indication of acute disease, while monocytes serve as an indication of chronic diseases such as RA. High monocyte and neutrophil values can occur in RA patients when they experience inflammation.

Basophils are a type of white blood cell that is part of the immune system. Their main function is to destroy foreign substances in the body. The results of the study showed that 19 people (95%) had normal values and 1 person (5%) had high values. Eosinophils are part of the immune system that functions as a response to infection or controls the body against allergies. The results of the study showed that 18 people (90%) had normal values and 2 people (10%) had high values. These results are influenced in the same way as other types of leukocytes due to the immune response occurring within the patient's body. This can also be caused by other factors, such as the patient experiencing other inflammation, having specific allergies, or parasitic infestation (Takludar et al., 2017).

The results of the platelet parameter examination showed normal values in 18 people (90%) and low values in 2 people (10%). Low platelet values in RA patients are due to the immune response occurring in the body of RA patients. Analgesic drugs consumed by RA patients can also cause significant bleeding disorders. Meanwhile, an increase in platelet count can be caused by prolonged inflammation (Sandra & Anang, 2018).

Research conducted by Masyita Ainun Nisa in 2019 entitled "Leukocyte Count in RA Patients in Soropia District" with results from 32 RA patient samples found that 29 patients (90.63%) showed normal leukocyte counts and 3 patients (9.37%) showed increased leukocyte counts. These results show that this study is in line with the results obtained in previous studies, which found that one of the routine blood parameters showed normal values, while some were high.

Based on studies that have been conducted on complete blood tests in RA patients, such as erythrocytes, hemoglobin, hematocrit, erythrocyte index, leukocytes, leukocyte types, and thrombocytes, the results tend to be normal. This is because joint inflammation in rheumatoid arthritis patients can improve quickly with routine treatment and a healthy lifestyle, such as regular exercise, regular meals, and no smoking.

Healthcare providers help rheumatoid arthritis patients improve their quality of life, one of which is through a healthy exercise program held once a week. With this program, the health of patients can improve, which can affect blood values that tend to be normal.

Therefore, routine blood tests cannot be used to conclude that RA patients or patients with chronic diseases have blood-related disorders such as anemia, leukemia, or blood clotting problems. Based on these results, researchers assume that routine blood tests are not a specific determinant but rather a screening or supporting test for blood disorders. Therefore, they need to be supplemented with a series of other tests.

CONCLUSION

Based on the results of research conducted on routine blood tests of RA patients in Ciamis Regency from the working areas of the Ciamis Community Health Center, Cijeungjing Community Health Center, and Handapherang Community Health Center from January to May, it can be concluded that the average values of erythrocytes, hemoglobin, hematocrit, erythrocyte index, leukocytes, leukocyte types, and thrombocytes were normal. These results indicate that RA does not affect blood values or the hematopoietic process.

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CONFLICT OF INTEREST

There is no conflict of interest in preparing this research and article.

REFERENCES

1. Agustin. (2019). Gambaran Pasien Reumatoid Artritis di RSUD Arifin Achmad Riau Province 2015 - 2019. Jurnal Ilmu Kedokteran, 14(1), 42–28. https://doi.org/10.26891/jik.v14i1.2020.45-51
2. Aliviameita. (2019). Buku Ajar Mata Kuliah Hematologi. Jawa Timur: Umsida Press. https://doi.org/10.21070/2019/978-623-7578-00-0
3. Dinkes Kabupaten Ciamis, (2022) Profil Kesehatan Kabupaten Ciamis Tahun 2022. Ciamis: Dinas Kesehatan Kabupaten Ciamis
4. Hidayat, R. (2021). Diagnosis dan Pengelolaan Rheumatologi. Jakarta: Penerbit Perhimpunan Rheumatologi Indonesia.
5. Kemenkes RI, (2019). Prevalensi Rheumatoid Arthritis di Indonesia. Diakses 05 Januari 2022, diambil dari: http://repository.poltekestasikmalaya.ac.id/920
6. Laniyati, H. (2020). Buku saku Rheumatologi. Jakarta: Perhimpunan Rheumatologi Indonesia.
7. Masyita, A. N, (2019). Gambaran Jumlah Leukosit Pada Penderita Rheumatoid Arthritis di Kecamatan Soropia. Karya Tulis Ilmiah. Poltekes Kemenkes Kendari
8. Paula Savola et.all, (2018). Hematopiesis Klonal Pada Pasien Dengan Rehumatoid Arthritis, Jurnal Kanker Darah. 8(69), 50-57. https://doi.org/10.1850/JKD. v8i69.237680.
9. Riskesdas, (2018). Hasil Utama Riset Kesehatan Daerah (RISKESDAS). Vol. 44, Issue 8. https://doi.org/10.1088/1751-8133//44/8/085201.
10. Sandra & Anang, (2018). A to Z Penyakit Rematik Autoimun. Jakarta; Penerbit PT Elex Media Komputindo.
11. Talukdar, M., Barui, G., Adhikari, A., Karmakar, R., Ghosh, U. C., & Das, T. K. (2017). A Study on Association between Common Haematological Parameters and Disease Activity in Rheumatoid Arthritis. Journal Of Clinical And Diagnostic Research, 11(1), 1–4. https://doi.org/10.7860/JCDR/2017/23524.9130
12. WHO, (2019). Prevalensi Rheumatoid Arthritis di Dunia. Diakses 28 Juni 2023, Diambil dari: https://www-who-int.translate.goog/news-room/fact-sheets/detail/rheumatoid-arthritis