

Reumatoid Factor Examination in Thalassemia Patients

Doni Setiawan^{1*}, Via Oktaviani Hiytulmadani¹, Atun Farihatun¹

¹ Diploma Medical Laboratory Technology, STIKes Muhammadiyah Ciamis, West Java, Indonesian

* Corresponding author : donisetiawan@stikesmucis.ac.id

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ABSTRACT

Background & Objective Patients with thalassaemia major with severe anaemia must receive blood transfusions for life. Giving continuous blood transfusions can cause iron accumulation in body tissues so that it can conclude complications, one of which is rheumatoid arthritis due to iron deposition in synovial tissue.

This study is to determine the results of rheumatoid factor examination in thalassaemia patients with blood transfusion therapy.

Method the research used is descriptive. The sampling technique uses incidental with a large number of samples as many as 66.

Result Based on the results of the study obtained positive results as many as 11 (17%) people with an average Rheumatoid Factor level of 29 IU/mL, and negative results as many as 55 (83%) people.

Conclusion Thalassaemia patients with blood transfusion therapy show the risk of rheumatoid arthritis with positive results of rheumatoid factor examination.

Keywords Transfusion ; Rheumatoid Arthritis; Iron.

Introduction

Thalassemia is a blood disorder that is inherited from parents to children and is a haemoglobinopathy disease due to impaired formation caused by structural disorders of haemoglobin formation (Setiawan et al., 2020). The body cannot form normal red blood cells, so red blood cells are easily damaged or have a shorter

lifespan than normal blood cells, generally 120 days and anaemia occurs (Sukri, 2016). The World Health Organization (WHO) suggests that around 7% of the world's population is thought to be thalassemia carriers, and around 300,000 -500,000 babies are born with severe haemoglobin disorders each year. Indonesia is one of the countries with beta thalassaemia gene

carriers ranging from 3-10% (Menteri Kesehatan RI, 2018). Based on the records of the Indonesian Thalassemia Foundation health ministry, thalassemia cases are increasing, in 2012 the number of thalassemia was 4896 cases, in 2018 there were 8761 cases (Menteri Kesehatan RI, 2019). The number is spread across the country. The highest number is in West Java Province because the number of thalassaemia patients reaches 45% of all patients (Wibowo, 2019). Based on the observation of thalassaemia patients who perform routine transfusion treatment at the Ciamis Regional General Hospital as many as 191 people consisting of 45 adult patients and 146 children (Popti RSUD Ciamis, 2020).

Until now there is no drug that can cure thalassaemia completely, therefore to maintain their life thalassaemia patients must get transfusions. However, this transfusion if done continuously will cause side effects, namely the accumulation of iron in the body and cause serious health problems. Each transfusion the iron component enters the body about 250 ng at each period. This makes the continuous accumulation of iron and the body's inability to get rid of iron a major factor in the high iron in the body in thalassaemia patients. Therefore, thalassaemia patients are treated with iron chelation therapy to remove iron. Iron chelation therapy is a method where excess iron in the blood is removed using drugs such as deferiprone drugs (Rochman et al., 2019). Patients with thalassemia major with severe anaemia (Hb levels below 7 g/dL) must receive lifelong blood transfusions to overcome anaemia and maintain haemoglobin levels of 9-10 g/dL. Continuous blood transfusions can lead to

iron accumulation in body tissues, which can cause damage to organs such as the liver, spleen, kidneys, heart, joints and bone damage (Hutahaen & Hendrianingtyas, 2017). Thalassemia patients who receive repeated transfusions can experience transfusion reactions ranging from mild ones such as chills, pain in the joints, urticaria, to severe ones such as anaphylactic shock (Menteri Kesehatan RI, 2018).

Thalassemia patients with haemoglobinopathy can cause complications, one of which is rheumatoid arthritis due to iron deposition in synovial tissue. Rheumatoid arthritis is increased in haemoglobinopathies such as thalassaemia (Malpartida et al., 2017). Rheumatoid arthritis (AR) is a systemic autoimmune disease, a chronic inflammatory disorder that affects many joints which can be accompanied by a decrease in bone mass density which ultimately leads to bone fragility (osteoporosis). About 80-85% of people with rheumatoid arthritis have rheumatoid factor autoantibodies in the blood so that the presence of rheumatoid factor indicates rheumatoid arthritis (Nardin, 2014). According to previous research conducted by Meri in 2019 on the examination of rheumatoid factor in the elderly, 4 samples showed reactive results out of 21 samples. Patients who experience rheumatoid arthritis most often experience pain and swelling of the joints symmetrically, feel stiff, fatigue and discomfort. Uncontrolled rheumatoid arthritis eventually causes joint damage, deformity and disability, this is due to synovial inflammation. In the early stages of rheumatoid arthritis (RA) no drastic physical changes are observed, then some osteopenia can be seen with localised swelling and lack

of space in the joint area. The diagnosis of rheumatoid arthritis is based on laboratory examination, namely rheumatoid factor examination, which can indicate the presence of rheumatoid arthritis, which makes this antibody have a specificity of around 95% (Nardin, 2014). Based on observations at RSUD Ciamis, some patients with thalassaemia who do transfusions routinely for a long time (more than 3 years) can cause side effects of experiencing complaints of pain in joints such as fingers or toes, wrists, ankles and joints feel stiff, therefore a rheumatoid factor examination is needed.

Objective

This study is to determine the results of Rheumatoid Factor examination in thalassaemia patients with blood transfusion therapy.

Method

The population in this study were thalassaemia patients who performed transfusions routinely at Ciamis Hospital with a length of time of more than 3 years, with a total of 191 patients with thalassaemia in the period January-June 2021, with a sample size used in this study of 66. Sampling technique with quota sampling, in this study using incidental techniques. Inclusion criteria: patients with thalassaemia major who transfuse regularly and for a period of more than 3 years, thalassaemia patients who experience symptoms of pain in the joints and joints feel stiff and are not diagnosed with rheumatoid arthritis. Exclusion criteria: specimens that do not allow for examination such as haemolysis and patients who refuse to become respondents or resign as respondents. Rheumatoid Factor examination method is qualitative and semi-quantitative latex agglutination, with a sensitivity of 8 IU / mL.

Results

Based on the results of the examination of Rheumatoid Factor in thalassaemia patients at Ciamis Hospital with the number of samples studied as many as 66 samples in accordance with the inclusion criteria. The characteristics of the subjects used can be seen in table 1.

TABLE 1 Characteristics of Research Subjects based on Gender and Age

Variable	N	%
Age		
4-10	18	27
11-20	37	56
21-30	9	13
31-40	1	2
>40	1	2
Gender		
Man	36	54
Woman	30	46

Based on table 2 shows the results of the rheumatoid factor examination of 66 thalassaemia patients who do routine transfusions with positive results in 11 (17%) people and the average value of rheumatoid factor levels is 29 where rheumatoid factor levels show positive results and rheumatoid factor negative in 55 people (83%) people.

TABLE 2 Percentage of Rheumatoid Factor Examination Results in Patients with Thalassaemia at Ciamis Hospital

Results	N	%	Level (IU/mL)
Positive	11	17	29
Negative	55	83	-

The length of transfusion obtained positive results as many as 11 (92%) people who transfused more than equal to 19 years,

negative results as many as 1 (8%) people then obtained negative results as many as 53 (100%) people who transfused less than 19 years. In thalassaemia patients who do transfusions routinely at the RSUD who do transfusions 2x in a month, positive results were 7 (17%) people while negative results were 33 (83%) people and positive results who do transfusions 1x in a month were 4 (15%) people while negative results were 22 (85%) people.

Discussion

Based on the characteristics of the samples in table 1, the number of research subjects was 66 samples of thalassemia patients who did transfusions routinely at Ciamis Hospital where male subjects were more than women, but in thalassemia it does not look at gender this happens in accordance with Mendel's law that the beta major thalassemia gene is inherited autosomal recessively independent of gender (Hikmah, 2015). But the positive results showed more women than men. This shows that women are more at risk of rheumatoid arthritis due to the influence of hormones. Women have the hormone estrogen so that it can encourage immune responses and increase B cell activity (Elsi, 2018). While age is dominated by ages 11-20 years, this occurs because thalassaemia disease is an inherited disease, some thalassaemia patients who carry the gene will begin to show symptoms from a toddler's age so that most respondents in this study are aged 20 and under (Hikmah, 2015).

Based on Table 2 Rheumatoid Factor Examination in 66 samples of Thalasemia patients at Ciamis Hospital obtained positive rheumatoid factor results as many as 11 (17%) people with a length of transfusion of more than 19 years. The longest transfusion was 34 years with 35 years of age having a positive rheumatoid factor value with a rheumatoid

factor level of 16 IU/mL. This can be influenced by iron buildup which is related to the length of transfusion routinely causing iron buildup which can cause complications, namely Rheumatoid Arthritis. Iron in the body circulates in the blood, the body itself does not have an active mechanism to dispose of iron, therefore there can be a buildup of iron in the body caused by transfusion, when iron reaches 1000 ng/L (usually after the 10th-12th transfusion) is an early indication of iron chelation. The negative results of the Rheumatoid Factor examination were 55 (83%) people with the earliest transfusion of 4 years with the age of 5 years, this was found because the buildup of iron had not accumulated too much in the synovial so that when examined the titer was below 8 IU/mL (Rohimah & Puspasari, 2020). Factors that influence the occurrence of rheumatoid arthritis are age, gender, genetics, infection, and health behaviour (Anies, 2020).

Conclusion

Positive results were obtained as many as 11 (17%) people, most of whom had been transfused for more than 19 years, with an average Rheumatoid Factor level of 29 IU/mL, and negative results as many as 55 (83%) people. Thalassaemia patients with blood transfusion therapy show the risk of rheumatoid arthritis with positive results of rheumatoid factor examination.

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