CASE REPORT

Diagnosis and Management of Autoimmune Hemolytic Anemia in Systemic Lupus Erythematosus

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ABSTRACT

Autoimmune hemolytic anemia (AIHA) may indicate the first manifestation of systemic lupus erythematosus (SLE). It is estimated that the incidence of AIHA is around 10% in patients with SLE. The first-line therapy for AIHA is corticosteroids. Nevertheless, a second-line therapy may be considered if an adequate response is not obtained. Transfusion indication in AIHA patients do not differ from other types of anemia. These indications include the degree of hemolysis, the progression of anemia, and clinical symptoms. However, blood transfusion for AIHA patients is challenging due to the limited availability of serologically compatible blood. In addition, AIHA patients who receive transfusions have an increased risk of experiencing hemolytic transfusion reactions. In this paper, we aimed to present a case report on the diagnosis of AIHA in an SLE patient treated with second-line therapy and red blood cell transfusions. The patient was a 49-year-old woman who presented with the main complaint of swelling in both legs. According to the medical history, the patient experienced petechia, abdominal distension, body weakness, and weight gain. No reports of joint pain, diarrhea, constipation, fever, shortness of breath, or yellowish skin were made. Before being referred to Dr. Soetomo General Academic Hospital in Surabaya, Indonesia, the patient experienced high blood pressure and body swelling that were unresponsive to treatment. Once the diagnosis of AIHA was confirmed, the patient was set to receive second-line therapy and red blood cell transfusions. At the conclusion of the therapy, the patient exhibited favorable outcomes.

Keywords: Autoimmune hemolytic anemia; systemic lupus erythematosus; blood transfusion; medicine

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Highlights:
1. This paper presents the management of autoimmune hemolytic anemia in systemic lupus erythematosus, which has been understudied in Indonesia.
2. This paper provides additional evidence regarding the indications and outcomes of red blood cell transfusion in a case of autoimmune hemolytic anemia.

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INTRODUCTION

The manifestations of SLE can occur in various organs and organ systems, including the hematological system. These manifestations may include iron deficiency anemia, anemia of chronic disease, thrombocytopenia, leukopenia, lymphopenia, and AIHA (Sumariyono et al., 2019). AIHA refers to the condition when the immune system mistakenly attacks and destroys its own red blood cell antigens, resulting in decompensated hemolysis (Hill et al., 2019). This disorder may serve as the first manifestation of SLE and persists for a long time before the diagnosis of SLE is established (Sumariyono et al., 2019). The estimated prevalence rate of AIHA in patients with SLE is 10% (Santacruz et al., 2022). The diagnosis of AIHA is carried out through several stages. It begins by confirming the morphology of anemia, followed by distinguishing the mechanism of hemolysis, and finally identifying the specific type of antibody involved. A positive result from a direct antiglobulin test (DAT), such as the Coombs test, confirms the diagnosis of AIHA (Sumariyono et al., 2019).

Corticosteroids have been used as the first-line therapy for AIHA. If there is no satisfactory response second line therapy with oral prednisolone in addition to methylprednisolone pulse, azathioprine, cyclophosphamide, or splenectomy is recommended (Sumariyono et al., 2019). Transfusion indication for AIHA is the same as those for anemia caused by other medical conditions. Transfusion may be indicated depending on the

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degree of hemolysis, the progression of anemia, and the presence of clinical symptoms. The purpose of transfusion in patients with AIHA and severe anemia is to maintain hemoglobin (Hb) levels that are clinically tolerable (Barros et al., 2017). Despite its importance, providing blood transfusions to AIHA patients poses a challenge because the availability of serologically compatible blood is limited. AIHA patients who get blood transfusion are at a heightened risk of experiencing hemolytic transfusion reactions (HTR) (Chen et al., 2020). This case report aimed to present the diagnosis of AIHA in a patient with SLE who received second-line therapy and red blood cell (RBC) transfusion, which resulted in favorable outcomes.

CASE REPORT

A patient, Mrs. SM, was referred from Dr. Haryoto Regional General Hospital in Lumajang, Indonesia, to the Department of Rheumatology at Dr. Soetomo General Academic Hospital in Surabaya, Indonesia, with the diagnosis of SLE and lupus nephritis. The 49-year-old patient came with the main complaint of swelling in both legs. According to the patient's most current medical history, there had been a presence of swelling in both legs for four weeks, which had progressively worsened during the past two weeks. In addition, the patient reported complaints of petechia, abdominal distension, weakness, and weight gain from 54 to 59 kg. There were no complaints of joint pain, diarrhea, constipation, fever, shortness of breath, or yellowish skin.

The medical history revealed that the patient had been diagnosed with SLE in mid-2020. The diagnosis was established based on several symptoms, including joint pain in the hands and feet, hair loss, headaches, body weakness, yellowish skin, weight loss, petechia, and recurrent anemia. The patient was previously administered 50 mg Imuran tablets and 16 mg methylprednisolone tablets. From November to December 2022, the patient decided to stop taking her medications. In January 2023, the patient revisited the polyclinic and resumed the previous course of treatment. However, the patient developed high blood pressure and body swelling that did not improve with treatment. She was then referred to the Department of Rheumatology at Dr. Soetomo General Academic Hospital in Surabaya, Indonesia. The patient reported no prior medical history of diabetes mellitus, high blood pressure, heart disease, kidney disease, or stroke.

The patient's social history showed that she was married and was residing with her husband and two sons. She attained a bachelor's degree as her highest level of education. The patient did not engage in smoking, drinking, or passive smoking behaviors. The patient was of Javanese descent, practiced the Islamic faith, and was a housewife.

The patient's physical examination revealed satisfactory general condition, with a Glasgow Coma Scale (GCS) score of 456, blood pressure of 178/114 mmHg, heart rate of 90 bpm, sufficient volume of air, regular breathing rate of 20x/minute, oxygen saturation of 99% on room air, axillary temperature of 36.1 °C, and body weight of 59.5 kg. Upon examination of the head and neck, the conjunctiva indicated that the patient was anemic. There were no signs of jaundice, cyanosis, dyspnea, or increased jugular venous pressure. The chest examination showed results that were within normal limits. The abdominal examination revealed no enlargement of the liver and spleen or presence of ascites. The examination of the extremities revealed the presence of edema and petechia on both legs. The laboratory examination revealed a hemoglobin level of 8.7 g/dL, hematocrit concentration of 25%, leukocyte count of 4,900 cells/mm3, neutrophil count of 64%, lymphocyte count of 13%, platelet count of 164,000 cells/mm3, erythrocyte sedimentation rate (ESR) of 36, blood urea nitrogen (BUN) level of 70 mg/dL, and serum creatinine level of 3.8 mg/dL. Additionally, the complete urine test showed a positive result for albumin (+++).

Working diagnosis and treatment plan for the patient

According to the examination results, the working diagnosis indicated that the patient was suspected to have SLE, lupus nephritis, anemia (with a hemoglobin level of 8.7 g/dL), and stage 2 hypertension. The diagnostic planning comprised a complete blood count, renal function test, liver function test, albumin blood test, urinalysis, antinuclear antibody (ANA) test, complement component 3 (C3) and component 4 (C4) test, anti-double stranded deoxyribonucleic acid (anti-dsDNA) test, and peripheral blood smear. Once the diagnosis was established, the treatment plan consisted of 2 x 50 mg Sandimmun tablets, 1 x 5 mg Lisinopril tablets, 1 x 100 mg Diltiazem tablets, 1 x 100 mg spironolactone tablets, 3 x 40 mg furosemide tablets, and 1 x 500 mg methylprednisolone intravenous injection for three days.

Course of disease and the patient's treatment response

On the third day of treatment, the swelling in the legs decreased. The urine exhibited a foamy appearance. There was an absence of bleeding. The general condition was adequate, as shown by a Glasgow Coma Scale (GCS) score of 456. The patient's vital signs were within normal limits, except for a blood pressure reading of 148/87 mmHg. The body weight was measured to be 59.5 kg. The urine secretion was 1,500 cc within a 24-hour period. The laboratory examination revealed the following results: Hb level of 7.4 g/dL, mean corpuscular volume (MCV) of 95.6 fL, mean corpuscular hemoglobin (MCH) level of 32.9 pg/cell, hematocrit concentration of 21.5%, leukocyte count of 5,230 cells/mm3, neutrophil concentration of 77.6%, lymphocyte concentration of 13.6%, platelet count of 124,000 cells/mm3, ESR of >140 mm, BUN level of 25.4 mg/dL, serum creatinine level of 1.5 mg/dL, serum glutamic oxaloacetic transaminase (SGOT) level of 12.9 U/L, serum glutamic pyruvic transaminase (SGPT) level of 11 U/L, uric acid level of 8.2 mg/dL, albumin level of 2.20 g/dL, ANA level 47.9 AU/mL, complement C3 level of 62 mg/dL, complement C4 level of 18 md/dL, anti-dsDNA level of 66.2 IU/mL.

Both the indirect Coombs test and the DAT showed positive results. The tests revealed a total bilirubin of 0.5 mg/dL, a direct bilirubin level of 0.2 mg/dL, a reticulocyte count of 3.7% (normal range: 0.80-2.21%), and an absolute reticulocyte count of 0.08 x 106/µL (normal range: 0.034-0.1 x 106/µL). The peripheral blood smear indicated a normochromic normocytic anemia anisopoikilocytosis. The urinalysis revealed the presence of erythrocyte 2+ and protein 2+. Additionally, the urine albumin-to-creatinine ratio (A:C) was determined to be ≥300 mg/gCr. The urine protein to creatinine ratio (P:C) was ≥0.50 mg/gCr, and the albumin level exceeded normal limits. The Esbach test showed a protein level of 1.0 gr/L, with a total protein excretion of 1.5 gr over a 24-hour period. The diagnosis of SLE was confirmed based on the 2019 European League Against Rheumatism/American College

of Rheumatology (EULAR/ACR) classification criteria, with a score of 23. Furthermore, there were additional diagnoses present, including lupus nephritis, AIHA (with a decrease in hemoglobin concentration from 8.7 to 7.4 g/dL), hypoalbuminemia (with an albumin level of 2.2 g/dL), stage II hypertension, and hyperuricemia (with a serum uric acid level of 8.2 mg/dL).

On the fifth day of treatment, there was a continuous decrease in the swelling of the legs. The urine still exhibited a foamy appearance. Furthermore, there were also no indications of bleeding. The patient's general condition remained adequate, as indicated by a Glasgow Coma Scale (GCS) score of 456. All of the patient's vital signs were normal, except for a blood pressure reading of 150/80 mmHg. The measurement of the patient's body weight showed a decrease to 57.5 kg. The urine secretion, which amounted to 1,650 cc within 24 hours, exhibited an increase compared to the third day of treatment. The results of the laboratory examination were as follows: Hb level of 6.7 g/dL, MCV of 95.8 fL, MCH level of 31.6 pg/cell, hematocrit concentration of 20.3%, leukocyte count of 7,030 cells/mm3, neutrophil concentration of 95.2%, lymphocyte concentration of 2.8%, platelet count of 128,000 cells/mm3, ESR of >140 mm, BUN level of 48 mg/dL, and serum creatinine level of 2.1 mg/dL. An additional diagnostic plan was implemented, which involved conducting the hepatitis B surface antigen (HBsAg) test and the hepatitis C antibody (anti-HCV) test. The patient continued the treatment in addition to receiving two bags of packed red cell buffy coat removed (PRC-BCR) transfusion, 2 x 125 mg of methylprednisolone intravenous injection, and 1 x 500 mg of cyclophosphamide injection.

By the ninth day of treatment, the patient exhibited no presenting complaints. There was also an absence of bleeding. The patient's general condition continued to be adequate, as evidenced by a Glasgow Coma Scale (GCS) score of 456. However, the patient's blood pressure, measuring 156/79 mmHg, still exceeded the normal range. The patient's other vital signs appeared normal. The edema in the pretibial region of both feet was minimal. The measurement of the patient's body weight indicated a continuous decrease, ultimately reaching 56 kg. The urine secretion dropped to 1,200 cc throughout a 24-hour period. The laboratory examination yielded the following results: Hb level of 9.6 g/dL, MCV of 88.3 fL, MCH level of 30.5 pg/cell, hematocrit concentration of 20.3%, leukocyte count of 7,110 cells/mm3, neutrophil concentration of 92.8%, lymphocyte concentration of 2.7%, platelet count of 126,000 cells/mm3, ESR of 25 mm, BUN level of 65 mg/dL, serum creatinine level of 2.0 mg/dL, and albumin level of 2.51 g/dL. According to these test results, the patient was planned for outpatient treatment and follow-ups at the polyclinic.

DISCUSSION

SLE is an autoimmune disease characterized by the loss of self-tolerance as well as the formation of nuclear autoantibodies and immune complexes, which can cause inflammation in multiple organs (Durcan et al., 2019; Ameer et al., 2022). The disease course of SLE consists of numerous episodes of relapse and remission, with clinical manifestations and disease severity that are very different in each patient (Firestein et al., 2020). Gene, race, and ethnicity have a major impact on the manifestation and severity of SLE. Black, Asian, and Hispanic individuals are more likely to develop early, severe, and active SLE. They also tend to experience long-term damage, which leads to increased risk for mortality (Durcan et al., 2019).

SLE commonly occurs in women of childbearing age. The prevalence ratio between women and men, specifically in the age range of 15 to 44 years, is 13:1. Meanwhile, the prevalence ratio between children and the elderly is only 2:1 (Fava & Petri, 2019). Globally, the prevalence of SLE in adults ranges from 30 to 150 cases per 100,000 individuals, with an incidence of 2.2 to 23.1 cases per 100,000 individuals every year. The incidence and prevalence of SLE are higher in Black, Asian, and Hispanic people in comparison with white people (Durcan et al., 2019). On the other hand, prior research has shown a rising prevalence of SLE over time in North America, Europe, and Asia (Barber et al., 2021). According to data from several polyclinics in Indonesian hospitals, there has been an increase in the number of visits by SLE patients. The visits increased from 17.9–27.2% in 2015 to 18.7–31.5% in 2016, and further increased to 30.3-58% in 2017 (Sumariyono et al., 2019).

Symptoms of SLE that often appear are constitutional symptoms (such as fever, fatigue, and weight loss), cutaneous manifestations (such as malar rash), and joint manifestations (such as arthritis or arthralgia). Each of these manifestations is found in 50% of SLE patients (Firestein et al., 2020). The manifestation of SLE can also occur in several organs or organ systems, including the kidneys, neuropsychiatry, lungs, heart, blood vessels, digestive tract, eyes, obstetrics, endocrine, and hematology (Sumariyono et al., 2019).

SLE patients frequently exhibit hematological abnormalities at the time of diagnosis as well as throughout the course of the disease (Santacruz et al., 2022). SLE can result in several instances of blood cell cytopenia, which includes anemia, leukopenia, and thrombocytopenia (Mo et al., 2021). Anemia is the most common hematological disorder found in SLE patients, affecting more than 50% of cases (Santacruz et al., 2022). Anemia is defined as Hb levels that are lower than 12 g/dL in women and lower than 13 g/dL in men (Cappellini & Motta, 2015). Anemia in SLE patients can manifest as different types, such as anemia of chronic disease, iron deficiency anemia, hemolytic anemia, thrombotic microangiopathy, aplastic anemia, and AIHA (Sumariyono et al., 2019).

AIHA is a decompensated hemolysis caused by the body's immune system attacking its own red blood cell antigens. The classification of AIHA as primary or secondary depends on the presence of an underlying disease or condition that triggers immune system dysregulation (Hill et al., 2019). AIHA can present as the initial manifestation of SLE. However, it may persist for a long time prior to the confirmation of SLE diagnosis (Sumariyono et al., 2019). The incidence of AIHA is quite rare, with only 1-3 occurrences per 100,000 individuals annually. This condition is more common in individuals over the age of 40 or in early childhood (Barcellini et al., 2020). The incidence of AIHA in individuals suffering from SLE is estimated to be 10% (Santacruz et al., 2022). Although AIHA is considered rare, it has a mortality rate of approximately 11% (Park, 2016).

Patients diagnosed with hemolytic anemia exhibit signs and symptoms of hemolysis. At the clinical level, this may be observed easily by identifying the presence of jaundice (Jameson et al., 2018). Jaundice appears when the level of serum bilirubin rises more than 2.5 to 3 mg/dL (Gondal & Aronsohn, 2016). In many cases, splenomegaly may be found since the spleen is the site of hemolysis. However,

hepatomegaly may also present in some other cases (Jameson et al., 2018).

Hemolytic anemia can occur intravascularly or extravascularly (Barcellini & Fattizzo, 2015). In most cases, extravascular hemolysis is the predominant occurrence. Extravascular hemolytic anemia can be diagnosed through laboratory examination, which will reveal the occurrence of unconjugated hyperbilirubinemia. In patients with normal liver function and no other conditions, hyperbilirubinemia is usually mild, marked by an unconjugated bilirubin level of 15% or lower of the total serum bilirubin. Extravascular hemolysis is characterized by increased levels of aspartate aminotransferase (AST) and urobilinogen in the blood and feces. Meanwhile, laboratory examination of intravascular hemolytic anemia may reveal several findings. These include hemoglobinuria, free hemoglobin in the serum, increased levels of lactate dehydrogenase (LDH), decreased levels of haptoglobin, and serum bilirubin levels that may be within the normal range or slightly elevated (Jameson et al., 2018).

The process of diagnosing AIHA begins with confirming the specific morphological pattern of anemia, followed by distinguishing the hemolysis process, and finally identifying the type of antibody responsible for causing the hemolysis. In AIHA, the morphology of red blood cells is either normocytic or macrocytic. After the morphological pattern of anemia has been confirmed, the next step is to distinguish whether the hemolysis process is immune or non-immune. Positive results of DAT confirms the diagnosis of AIHA (Sumariyono et al., 2019). The standard direct antiglobulin test reveals the presence of immunoglobulin G (IgG) and/or complement on the surface of erythrocytes. The C3d, a derivative of the component of complement 3 (C3), is commonly detected in the direct antiglobulin test. A direct antiglobulin test, when performed with an extended panel, is capable of detecting the existence of immunoglobulin M (IgM) and immunoglobulin A (IgA) autoantibody classes, which are present on the surface of erythrocytes (Hill & Hill, 2018).

The first-line therapy for patients with AIHA and SLE consists of corticosteroids, specifically prednisolone, at a dose of up to 1 mg/kg bw per day, divided into several doses. High-dose corticosteroids are given if severe AIHA occurs or when the hemoglobin level is lower than 8 g/dL. Hemoglobin levels are anticipated to increase within three weeks after starting the drug administration. A positive response to therapy is indicated by an increase in hematocrit level and a decrease in reticulocyte count. These indications suggest that the corticosteroid dose can be gradually decreased. If there is no response within three weeks, it is recommended to consider a second line therapy, which includes a daily administration of 15 mg of prednisolone given through oral route in combination with 1,000 mg of intravenous methylprednisolone pulse therapy for three days. Alternatively, intravenous azathioprine can be administered in doses of up to 2 mg/kg bw per day, or cyclophosphamide can be used in doses of up to 2 mg/kg bw. Another option is to undergo splenectomy. Monthly administration of intravenous pulse cyclophosphamide therapy in combination with intravenous methylprednisolone and followed by oral corticosteroids can be used to treat severe non-renal SLE, including cases accompanied by AIHA. However, it is important to note that the administration of cyclophosphamide needs to be adjusted based on the patient's creatinine clearance and in compliance with the Euro-Lupus or National Institute of Health (NIH) protocols. The purpose is to minimize the side effects of cyclophosphamide, which include nausea, vomiting, hair thinning, and reversible alopecia (Sumariyono et al., 2019).

Red blood cell transfusions are frequently necessary for the management of AIHA (Barros et al., 2017). The provision of blood transfusions for patients with AIHA is contingent upon the availability of serologically compatible blood. Red blood cells that are compatible do not cause a reaction when exposed to red blood cell antibodies present in the patient's serum. Nevertheless, autoantibodies present in patients with AIHA have the probability to react with both screening cells and donor cells, which poses a challenge in obtaining compatible blood for the patients (Chen et al., 2020).

Red blood cell transfusion is not a contraindication for patients with AIHA, but it is only administered in cases of life-threatening anemia or cases with a high risk of cardiovascular ischemic events (Chaudhary & Das, 2014). The administration of transfusions in patients with AIHA carries an increased risk of hemolytic transfusion reactions (HTR). Autoantibodies present in AIHA patients have the ability to cause destruction of donor red blood cells, hence worsening the process of hemolysis (Chen et al., 2020).

The indications for transfusion in AIHA patients are the same as those in patients with other types of anemia. Transfusions are administered depending on the degree of hemolysis, the progression of anemia, and the presence of clinical symptoms. The purpose of red blood cell transfusion in AIHA patients with severe anemia is to maintain clinically tolerable hemoglobin levels until the administered therapy can reduce hemolysis and the bone marrow can compensate for the destruction of red blood cells. Transfusion is indicated for patients exhibiting symptoms of hypoxemia, such as angina, cardiac symptoms, and neurological symptoms such as lethargy, weakness, drowsiness, and confusion. These symptoms usually appear in cases of severe anemia where the hemoglobin levels are lower than 5 g/dL (Barros et al., 2017). In critical conditions, blood transfusion should not be delayed because it will increase complications, reduce prognosis, and even result in death (Chaudhary & Das, 2014). In cases of mild or moderate anemia, with hemoglobin levels higher than 8 g/dL, red blood cell transfusion is rarely required. AIHA patients who have hemoglobin levels of 5–8 g/dL must be closely monitored both clinically and in the laboratory until the symptoms of anemia are controlled and the severity of hemolysis is reduced. The presence of worsening symptoms of hypoxia due to anemia indicates that the patient needs a red blood cell transfusion until the current therapy becomes effective (Barros et al., 2017).

Close monitoring and adherence to standard protocols are essential when providing blood transfusions for patients with AIHA. In order to assure the safety and compatibility of the blood, it is necessary to perform a minimum of three tests, i.e., DAT, antibody screening, and autocontrol test (Chaudhary & Das, 2014). An autocontrol test is carried out by examining the patient's serum using the patient's own red blood cells. Positive results from the autocontrol test confirm the detection of autoantibodies (Kokoris et al., 2022). Prior to a blood transfusion, a crossmatch analysis may also be conducted, consisting of two parts: major and minor. A major crossmatch examination is carried out to detect any incompatibility between the patient's serum and the donor's red blood cells. In addition, this examination can determine whether there are any antibodies in the

patient's serum. A minor crossmatch examination, on the other hand, is conducted to detect any incompatibility between the donor's serum and the patient's red blood cells (Irawaty et al., 2018). The most compatible blood units for transfusion in AIHA patients is the one that has a lower positive crossmatch result comparing to auto control result (Das et al., 2014).

During emergency situations, it is possible to provide blood transfusions for AIHA patients by matching their blood type using the ABO and Rh blood group systems. However, it is important to first rule out the presence of alloantibodies by anamnesis about the patients' transfusion and pregnancy history (Andriastuti et al., 2022). Recent findings revealed that AIHA patients who received transfusions with modified blood components, such as leukoreduced red blood cells and washed red blood cells, demonstrated an increased response to hematological parameters and experienced fewer side effects in comparison to transfusions using unmodified blood components (red blood cell suspension). Administering washed red blood cells is more advantageous than using leukoreduced red blood cells in terms of increasing red blood cell count, hemoglobin levels, and reticulocyte percentage, while also minimizing side effects.

The use of washed red blood cells resulted in a 56% decrease in the incidence of side effects, whereas the use of leukoreduced red blood cells only led to a 28% decrease in comparison to suspended red blood cells. However, the use of washed red blood cells is limited by issues related to their availability, a longer preparation process, and a shorter expiration time. There are still a few trials on the use of washed red blood cells in AIHA. Therefore, there are currently no guidelines that recommend the use of washed red blood cells. Meanwhile, several literatures have recommended the use of leukoreduced red blood cells in AIHA, as reported in a study conducted by Deng et al. (2021). The study demonstrated that obtaining leukoreduced red blood cells is easier compared to washed red blood cells. Packed red cell buffy coat removed (PRC-BCR), a product from leukoreduced red blood cells, is generally available at the blood donor centers of the Indonesian Red Cross (Ministry of Health of the Republic of Indonesia, 2015).

This paper offers new insight into the diagnosis and treatment of AIHA in a patient with SLE. The case presented in this paper demonstrated that the administration of second-line therapy and red blood cell transfusions resulted in favorable outcomes for the patient. These findings can serve as supplementary evidence for future research. Nevertheless, due to the limited scope of this case report, which includes only one patient and lacks comparison groups, the findings cannot be generalized to a broader population.

SUMMARY

This case report demonstrates the effectiveness of second-line therapy using cyclophosphamide in combination with blood transfusions for managing AIHA in a patient diagnosed with SLE. The diagnosis of AIHA was confirmed through DAT, specifically the Coombs test, which revealed positive results. A first-line therapy for AIHA using corticosteroids was initially administered to the patient. However, the patient did not exhibit any favorable response to the first-line therapy. As a result, the medical team opted to administer second-line therapy and blood transfusions, which turned out to be effective in managing AIHA in the patient with SLE.

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CONFLICT OF INTEREST

The authors declare there is no conflict of interest in this study.

PATIENT CONSENT FOR PUBLICATION

The patient involved in the study has provided her consent for the publication of this paper.

FUNDING DISCLOSURE

No funding was received for conducting this study.

AUTHOR CONTRIBUTION

All authors made essential contributions to each process of this research, including the conception and design, analysis and interpretation of the data, drafting of the article, critical revision of the article for important intellectual content, final approval of the article, provision of study materials and the patient, provision of administrative, technical, or logistic support, and collection and assembly of data.

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