



CASE REPORT: SYSTEMIC LUPUS ERYTHEMATOSUS IN A 10-YEAR-OLD GIRL WITH SHORT STATURE

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ABSTRACT

Background: *Systemic Lupus Erythematosus* (SLE) disease is an evolutionary systemic disease affecting one or several organs of the body, such as the kidneys, skin, blood cells and blood system. In sick children, in addition to maintaining growth and development, fulfilling nutritional needs is very useful for accelerating the healing process, shortening the treatment period, reducing the occurrence of complications, reducing morbidity and mortality and preventing malnutrition due to medication or medical action. The purpose of this case is to report a case and develop management of children with SLE so that malnutrition does not occur. **Case Presentation:** a 10-year-old girl came complaining of difficulty walking, patient's face was also swollen. Patients with a history of SLE, lupus nephritis, normotension on control, and had undergone 4 times CPA treatment but stopped since March 2020. The patient will continue the 2nd month of *Cyclophosphamide* (CPA) treatment, but the laboratory examination results show proteinuria +3, the patient also found good nutrition, short stature, and underweight, patient advised to be hospitalized. **Conclusion:** The patient was diagnosed with SLE, lupus nephritis, normotension on control, short stature, and underweight. Patients receive therapy in the form of methylprednisolone, CPA, anti-hypertensive supportive therapy and management of underweight and short stature children due the medication. This case may develop management of children with SLE so that malnutrition does not occur.

Keywords: *SLE, Nephritis Lupus, Short Stature*

INTRODUCTION

Systemic Lupus Erythematosus disease is an evolutionary systemic disease affecting one or several organs of the body, such as the kidneys, skin, blood cells and blood system, characterized by extensive inflammation of blood vessels and connective tissue, episodic in nature interspersed with periods of remission, and is characterized by the presence of autoantibodies, particularly antinuclear autoantibodies. This disorder is a clinical syndrome accompanied by immunologic disorders, such as dysregulation of the immune system, formation of immune complexes and most importantly the presence of antinuclear antibodies, and the cause is not yet known.¹

The incidence of SLE in children is 10-20 cases of 100.000, overall an increase of about 15-17%. SLE is rare in children under 5 years of age. Women are affected more often than men, and this ratio also increases with age due to the influence of the oestrogen. More than 80% of children with SLE have evidence of kidney involvement at some time in the disease.² Hypertension is a major risk factor for the development of cardiovascular disease and is prevalent in patients with SLE.³

Treatment of SLE is to improve symptoms and reduce the risk of remission as the disease

progresses. Drugs commonly used in pharmacological therapy for people with SLE are NSAIDs (*Non-Steroid Anti-Inflammatory Drugs*), corticosteroids, and immunosuppressant drugs.⁴

In sick children, in addition to maintaining growth and development, fulfilling nutritional needs is very useful for accelerating the healing process, shortening the treatment period, reducing the occurrence of complications, reducing morbidity and mortality and preventing malnutrition due to medication or medical action.⁵

In this report, a 10-year-old girl with SLE, lupus nephritis, normotension on control, underweight and short stature will be discussed.

CASE REPORT

A 10-year-old girl came for control to dr. Kariadi Hospital on February 25, 2021 to continue the second month of *Cyclophosphamide* (CPA) treatment. From the laboratory examination, the results of proteinuria +3 were obtained and she was advised to be hospitalized. 4 years before admission (2017) the patient's mother complained that the patient had continuous nosebleeds, coming out of both noses, 3 times a week. The patient also complained of stiffness in the legs with tenderness and had difficulty walking. The patient was then



taken to the Banjarnegara Hospital, said to have SLE and was given a blood transfusion. The patient went home with medication, and never returned to control.

Two years before admission (2019) the patient's mother complained about the patient's face swelling at the eyelids, swelling appeared suddenly, on the patient's cheeks also appeared redness, without itching and tenderness. Then, the patient went to the Banjarnegara Hospital. From the physical and laboratory examinations, the patient was diagnosed with lupus nephritic and hypertension. Patients were referred to dr. Kariadi Hospital, hospitalized, and routine control at dr. Kariadi Hospital for CPA treatment 450 mg IV until March 2020 (already taken 4 times). Treatment was not continued because of a pandemic. During non-control, the patient's parents on their own initiative gave methylprednisolone 4 mg and captopril for 9 months.

One month of before admitted, the patient complained of difficulty walking because the patient's legs and hands are stiff. The patient's face also became swollen again. The patient was taken to the Banjarnegara Hospital and then referred to the dr. Kariadi hospital to continue the CPA treatment. (First month's CPA)

The patient was born to a 28-year-old mother with G1P0A0, labor spontaneously in the hospital, helped by Obstetrics and Gynaecology Specialists in 40 weeks of gestation, immediately cried, there was no cyanosis, and there was no jaundice. The weight of birth is 3300 grams, mother did not remember the length of birth. During pregnancy, the mother often went to health services >4 times to do antenatal care (ANC), take vitamins, and blood booster tablets regularly. The Mother never took drugs outside of a doctor's prescription or herbal medicine, never got sick during pregnancy.

The patients had complete basic immunization a booster. The patient development is normal according to age, currently a grade 5 elementary school child. Patients can follow lessons well and play with their peers. Food recall in the last 3 days quality and quantity is just enough.

The mother's height is 155 cm, meanwhile the father's height is 170 cm. Nutritional history of breastmilk from 0-6 months, weaning food plus breastmilk from 6-7 months, porridge plus breastmilk from 7 - 12 months, and family food from 12 months until now. The patient has a history

of having difficulty eating 2 years ago, she just ate a little, and often buying snacks and drinks at stalls. The weight does not increase, so the mother gives full cream milk but is never be finished by the patient.

On the physical examination, general condition is good, active. The weight is 21 kg, height 104 cm, arm circumference 15 cm, BP 100/80 (on control), HR 100x/min, RR 20x/min, temperature 36,6 C. There is no pale palpebral conjunctiva, no sub-conjunctival bleeding, epistaxis, no atrophy papilla of tongue, gingival hypertrophy, no malar rash, no discoid rash, and no swelling. The examination of the chest, the breathing is static and dynamic, the stem fremitus is normal, sonor percussion of the entire lung field, vesicular base sound, no crackles or wheezing. The ictus cordis is not visible, palpable in SIC V left line midclavicle, heart configuration within normal limits, normal heart sounds, no gallops and no murmurs. The examination of abdomen showed normal positive bowel sounds, tympanic percussion, liver and spleen not palpable. The superior and inferior extremities are within normal limits. On examination of the genitalia, the gender is female.

Laboratory examination results obtained Hb 14.2 g/dL, haematocrit 42.5%, erythrocytes $4.7 \times 10^6/\mu\text{L}$, MCH 23 pg, MCV 91.5 fL, MCHC 32.1 g/dL, leukocytes $5.8 \times 10^3/\mu\text{L}$, platelets $40 \times 10^3/\mu\text{L}$. The results of clinical chemistry examination showed calcium 2.27 mmol/L, sodium 139 mmol/L, potassium 4.0 mmol/L, chloride 108 mmol/L. Antibody examination showed Anti dsDNA 219 and ANA levels of 187.3 In the urinalysis, urine is light yellow, saturated, specific gravity of pH 7.0, protein +3 epithelium 2-4/SFV, leukocytes 2-4/BFV, and erythrocytes 0-1/BFV.

Patients were given D51/4NS IV, methylprednisolone 8 mg orally, Calcitriol 0.25 mg/24 hours orally, Captopril 12.5 mg/12 hours orally, furosemide 20 mg/24 hours orally, Methylprednisolone pulse 375 mg/24 hours. For the management of underweight and the short stature, patient given a diet of 3x1 rice food, 3x200 cc of full cream milk. The monitoring is monitoring of general condition, vital signs, routine blood tests, urine protein, acceptability, tolerance and nutritional effectiveness.

Currently the patient has no complaints, no fever, no facial swelling, no stiffness, no nausea, no vomiting, no headaches, and no nosebleeds.



DISCUSSION

Systemic Lupus Erythematosus (SLE) is an autoimmune disease that attacks various tissues and organs in the body, such as the kidneys, skin, blood cells, and nervous system. It can also be defined as an episodic, multisystem and autoimmune disease characterized by a widespread inflammatory process in blood vessels and connective tissue, as well as the emergence of antinuclear-antibodies (ANA) on investigations, especially antibodies to double-stranded DNA (dsDNA).⁶

The SLE classification criteria refer to the classification made by the American College of Rheumatology (ACR) in 1982 and modified in 1997. The diagnostic criteria for children based on these criteria have a sensitivity of 96% and a specificity of 100%. (Table 1).

Two symptoms that often appear in children are skin rashes and arthritis. The typical malar rash, also known as butterfly rash, occurs as a result of excessive sensitivity to sunlight (photosensitive) and can worsen with viral infection or emotional stress. This rash is painless and does not itch. The amount of rash becomes small on the nasolabial folds and eyelids. Malar rash can heal completely without scarring with therapy. There may be ulcers on the mucous membrane. Hair can turn out to be drier and brittle, even to the point of alopecia. Arthritis occurs frequently, and may progress to swelling of the joints of the fingers or toes.^{1,6}

The initial immunologic test needed to make a diagnosis of SLE is a ANA test. ANA test should be done or checked only in patients with signs and symptoms suggestive of SLE. In patients with SLE, there is a positive ANA test of 95-100%, but the ANA test results can be positive in several other diseases that have a clinical picture similar to SLE, for example chronic infection (tuberculosis), autoimmune diseases (e.g., Mixed connective tissue disease (MCTD) rheumatoid arthritis, autoimmune thyroiditis), malignancy or in normal people.⁴

Some of the other tests that need to be done after a positive ANA test are tests for antibodies to specific nuclear antigens, including anti-dsDNA, Sm, nRNP, Ro (SSA), La (SSB), Scl-70 and anti-Jo. This examination is known as an ANA/ENA profile. Anti-dsDNA antibodies are a specific test for SLE, are rare in other diseases and have a specificity of nearly 100%.

In this case the patient found the 6 criteria of 11 criteria of ACR 1997 criteria. There are malar

rash, arthritis, anaemia, proteinuria, positive Anti-dsDNA results, and positive ANA results. So that the patient was diagnosed with Systemic Lupus Erythematosus.

Prednisone is almost always the choice in the management of SLE. Although there is many side effects of corticosteroids in the long-term, they are considered the best for lupus nephritis and SLE in general. At the onset of the disease the child is usually given a schedule of taking prednisone medication three times a day. In the middle, the dose is reduced but continued.⁷

The initial administration of corticosteroids starts with high doses, it is 2 mg/kg/day (maximum 80 mg/day) and gradually decreases; if there is an improvement in disease symptoms, proteinuria, kidney function, normalization of blood complement, and decreased anti ds-DNA titre. The reduction in dose lasts 4-6 weeks. The prednisone dose is gradually reduced to 5-10 mg/day or 0.1-0.2 mg/kg and maintained for 4-6 weeks. If a relapse does not occur, steroids are given intermittently and given in the morning. If a relapse occurs, the dose is increased again to 2 mg/kg/day.⁷

The use of low daily doses of corticosteroids in intermittent intravenous high doses with vitamin D and calcium supplementation can maintain bone mineral density. Pathologic fractures are rare in children with SLE. The risk of fracture can be prevented with calcium intake and a better exercise program. Avascular necrosis can occur in 10-15% of paediatric LES patients receiving long-term, high-dose steroids.⁶

Treatment with immunosuppressant (cytostatic) agents is used in combination with corticosteroids. The drugs most commonly used are cyclophosphamide (CPA) and azathioprine. Indications for the use of cytostatic drugs are:

- When the corticosteroid results are not satisfactory to control the disease
- If there are side effects to the use of corticosteroids, such as hypertension
- If the Nephritic Lupus (NL) is severe

Usually cytostatic drugs are given orally, but recently it has been reported that parenteral cytostatic use is cyclophosphamide by means of pulse therapy, namely by giving intravenous bolus 0.5-1 gram IV for 1 hour. It is recommended that children urinate frequently on the day of infusion to prevent complications of haemorrhagic cystitis.⁸



Table 1. American College of Rheumatology (ACR) Classification

No	Criteria	Domain
1	Malar rash	
2	Photosensitivity	Dermatological
3	Discoid lupus	
4	Oral or nasal ulcers	Mucosal
5	Non-erosive arthritis in 2 joints (tender, swollen, or effusion)	Musculoskeletal
6	Pleuritis or pericarditis	Serositis
7	Haemolytic anaemia or leukopenia (<400/mm ³) or Lymphopenia (<1500/mm ³) or Thrombocytopenia (<100/cm ³)	Haematologic
8	Proteinuria >500 mg/day or >3+ by dipstick or Cellular cast (RBC, haemoglobin, granular, tubular, or mixed)	Renal
9	Seizure or psychosis	Neuropsychiatric
10	Positive ANA	
11	Positive for anti-dsDNA or anti-Sm or antiphospholipid antibodies	Immunologic or serological

More than 80% of children with lupus have evidence of kidney involvement at some time in the disease. Even if all lupus patients were examined, a kidney biopsy was examined with an immunofluorescence microscope, abnormalities would be found in almost all cases even though the urinalysis had no abnormalities (silent NL). To make a diagnosis of NL, it is necessary to find the presence of SLE in the patient first. Diagnosis of SLE is based on the revised ACR criteria in 1997 as described above.

Kidney biopsy is indicated in all lupus nephritis patients, in other words, in SLE patients with urinalysis or other symptoms of NL, which are hypertension, elevated blood urea or creatinine levels. Histopathological classification of the kidney is needed to confirm the diagnosis of NL, establish the classification of NL patients, establish the type of treatment, establish prognosis, assess the success of treatment (by repeat biopsy).⁹

This patient found proteinuria +3 and having clinical manifestations of SLE. So, this patient is diagnosed with Nephritis Lupus. NL

ranging from no abnormalities in urinalysis, or only oedema, mild proteinuria or haematuria to severe clinical features, which nephrotic syndrome, glomerulonephritis accompanied by progressive decline in renal function, or hypertension.

In this case, patient prescribed Methylprednisolone 8 mg orally, Calcitriol 0.25 mg/24 hours orally and Methylprednisolone pulse 375 mg/24 hours for the SLE and NL. This patient also has a history of CPA treatment. The indication is the patient has been given treatment with steroids but does not improve to control the disease.

Linear growth can be influenced by ethnicity, genetics, hormonal, psychosocial, nutrition, chronic illness, and other environmental factors. Distraction linear growth will result in short stature. Short stature (short stature) is defined as height <P3 or -2 SD that curve apply according to age and gender. Short stature can be caused by pathological or non-pathological conditions pathologist so it is very important that a clinician knows how take a clinical approach in cases of short stature. Therefore, it is necessary to emphasize that stunting is a part of short stature however, not all short stature is stunting.¹⁰

In this patient, there is no family history of short stature was found. The mid parental height in this patient was 146-166 cm based on the calculation of the mother's age plus the father's age minus 13 then divided by two. Patient has never had bone age before. The short stature in this patient may be due to long-term use of corticosteroids, and insufficient daily nutritional intake. It is seen from the statement of the patient's mother, that 2 years ago the child had difficulty eating, ate only a little, and liked to buy food outside the home. Also, 2 years ago the child was prescribed steroid due the diagnosed of SLE.

Children and adolescents with SLE enter adult life but with considerable morbidity, which could be attributed to long-term disease activity, side effects of medications, and/or other comorbid conditions. The recognized morbidities, growth failure to SLE and may affect individual's quality of life as well as impose difficulties in physical and psychological adaptation to a chronic illness.¹¹

Another determinant factors of growth failure were the effect of high cumulative doses of steroids. Glucocorticoids-induced growth failure can be explained by its direct effects on the growth plate, which results in reduced proliferation of the chondrocytes and a reversible prolonged resting



period that leads to a temporary reduction in the growth rate.¹¹

Although to date recombinant Growth Hormone (GH) therapy is not indicated in the treatment of chronic inflammatory disease, SLE patients with significant short stature may be considered for GH therapy in the future. In other inflammatory diseases like juvenile idiopathic arthritis, randomized controlled trials have confirmed that GH therapy can improve final adult height and also suggest a modest effect on short to medium term catch-up growth.¹²

CONCLUSION

The patient was diagnosed as SLE that already had renal complication became Lupus Nephritic but had controlled blood pressure although received corticosteroid that can make blood pressure difficult to control. We need to manage the nutritional intake whether she had comorbidities due to SLE for nutritional status became short stature.

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