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Nutritional Management in a Patient with Systemic Lupus Erythematosus with Septic Shock Due to Granulicatella Elegans: A Case Report

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Systemic lupus erythematosus (SLE) is a chronic autoimmune disease characterized by dysregulated immune responses, autoantibody production, and immune complex deposition. Patients with SLE are highly susceptible to infection due to intrinsic immune dysregulation and prolonged use of immunosuppressive therapy. Malnutrition is a frequently overlooked comorbidity in SLE, with a reported prevalence of 46.2% among hospitalized patients. Granulicatella elegans is a fastidious Gram-positive coccus belonging to the nutritionally variant streptococci (NVS) group and is often undetected in routine culture media. We report the case of a 24-year-old woman presenting with a severe SLE flare complicated by septic shock due to Granulicatella elegans infection and severe malnutrition. Nutritional risk screening using the NRS-2002 yielded a score of 6, indicating severe nutritional risk. The patient's energy requirement was set at 2,200 kcal/day, with protein gradually increasing to 1.5 g/kg ideal body weight/day. In accordance with the ESPEN 2022 micronutrient guidelines, supplementation with vitamin C, vitamin D, zinc, and selenium was recommended as part of the comprehensive nutritional care plan to address immune dysfunction and oxidative stress associated with critical illness and systemic infection. After seven days of multidisciplinary management, the patient showed significant clinical improvement and was discharged on day seven. This case highlights the critical importance of early nutritional assessment, timely intervention with calibrated macronutrient targets, targeted micronutrient supplementation, and structured nutrition education as essential components of multidisciplinary care in critically ill SLE patients with sepsis.
Keywords: Granulicatella elegans, malnutrition, micronutrient, nutritional management, septic shock, systemic lupus erythematosus

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1. Introduction

Systemic lupus erythematosus (SLE) is a chronic, multisystem autoimmune disease characterized by autoantibody production, immune complex formation, and immune complex deposition in various organs. The pathogenesis of this disease involves complex immune system dysregulation, both innate and adaptive, leading to chronic inflammation and tissue damage in various target organs such as the kidneys, skin, joints, and nervous system (Kiriakidou & Ching, 2020).

Epidemiologically, SLE has an uneven distribution across populations. The disease is more common in women than in men, with a ratio of approximately 9:1, particularly in those of reproductive age. Furthermore, the prevalence of SLE is reported to be higher in Asian, African-American, and Hispanic populations than in Caucasian populations, suggesting the influence of genetic and environmental factors in the pathogenesis of the disease (Stojan & Petri, 2021).

The global burden of SLE continues to increase as diagnostic capabilities and clinical awareness of autoimmune diseases improve. Although the development of modern therapies has improved survival rates

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for SLE patients, the disease remains associated with significant morbidity and mortality due to organ complications and opportunistic infections (Carter et al., 2021).

Infection is one of the most common complications in SLE patients. Susceptibility to infection is caused by a combination of factors, including impaired immune system function due to the autoimmune disease itself, long-term use of immunosuppressive medications such as corticosteroids and other immunosuppressants, and organ damage that occurs during the course of the disease (Fanouriakis et al., 2021). Several studies have shown that infection is a leading cause of death in SLE patients in various countries. The risk of infection increases especially in patients with high disease activity, intensive immunosuppressive therapy, and co-morbid conditions (Tselios & Urowitz, 2020).

The latest guidelines from the European Alliance of Associations for Rheumatology (EULAR) emphasize that SLE management should be comprehensive and not solely focused on pharmacological therapy. Non-pharmacological interventions such as a healthy lifestyle, appropriate physical activity, and a balanced diet are also important in long-term disease management in SLE patients (Fanouriakis et al., 2023).

On the other hand, malnutrition is a comorbidity that often receives less attention in clinical practice in SLE patients. Chronic inflammation in autoimmune diseases can increase energy and protein requirements, while disease symptoms such as anorexia, fatigue, and medication side effects can decrease food intake, contributing to malnutrition (Lisnevskaia et al., 2020). Several recent studies have reported a high prevalence of malnutrition in SLE patients, particularly in hospitalized patients. Observational studies have shown that nearly half of hospitalized SLE patients are at significant risk of malnutrition based on clinical nutrition screening tools (Zhang et al., 2020).

Malnutrition in hospitalized patients is also a global health problem, contributing to increased length of stay, infectious complications, and mortality. A systematic review of the nutritional status of hospitalized patients in Asia reported that the prevalence of malnutrition exceeded 40% in most studies, highlighting the importance of routine nutritional screening in patients with chronic diseases (Kaegi-Braun et al., 2021).

Malnutrition has a significant impact on the immune system. Energy and protein deficiencies can lead to decreased immune cell function, impaired inflammatory response, and a decreased ability to fight infection. This makes malnourished patients more susceptible to severe infections and other clinical complications (Calder, Carr, Gombart, & Eggersdorfer, 2020).

One microorganism that is rare but can cause serious infections in immunocompromised individuals is Granulicatella elegans. This bacterium is a gram-positive coccus belonging to the nutritionally variant streptococci (NVS) group and is fastidious, making it often difficult to isolate using standard culture media in clinical microbiology laboratories (Adam et al., 2021).

*Granulicatella elegans*is generally a normal flora of the oral cavity, urogenital tract, and gastrointestinal tract. However, under certain conditions, especially in patients with impaired immune systems, this bacterium can cause invasive infections such as bacteremia, infective endocarditis, and even sepsis. Therefore, this case report aims to describe comprehensive nutritional management in a young female patient with a severe flare of SLE complicated by septic shock due to Granulicatella elegans and severe malnutrition as part of a multidisciplinary approach to critical care (Adam et al., 2021).

2. Method

This case report aims to describe the nutritional management of a patient with systemic lupus erythematosus (SLE) complicated by septic shock due to Granulicatella elegans infection. This case report

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was conducted using a descriptive approach, comprehensively analyzing the patient's clinical data during hospitalization. The data reviewed included patient characteristics, clinical condition, laboratory test results, nutritional status, and nutritional interventions administered during the treatment process.

The subject of this case report is a 24-year-old female patient diagnosed with SLE who experienced a severe flare and was hospitalized for septic shock, confirmed microbiologically as Granulicatella elegans infection. The diagnosis of SLE was established based on clinical findings and supportive laboratory tests, while septic shock was established based on clinical parameters and laboratory indicators indicating severe systemic infection.

Patient nutritional status is assessed from the beginning of treatment using a standardized nutritional screening method, the Nutritional Risk Screening (NRS-2002). This assessment includes evaluation of body mass index, weight loss, decreased food intake, and disease severity that may impact the patient's nutritional status. Additionally, anthropometric parameters, daily food intake, and laboratory tests related to nutritional status are monitored throughout the treatment period.

Nutritional interventions are administered in stages according to the patient's clinical condition and based on recommendations from international clinical nutrition guidelines. Target energy requirements are calculated based on the patient's metabolic needs, taking into account the acute illness and nutritional deficits. Protein intake is gradually increased to support tissue recovery and immune function. In line with the ESPEN 2022 micronutrient guidelines, comprehensive supplementation with vitamin C, vitamin D, zinc, and selenium was recommended as an integral component of nutritional support for systemic infections and critical illness. These micronutrients play pivotal roles in modulating immune responses and attenuating oxidative stress, and their supplementation is endorsed by current evidence-based guidelines for critically ill patients. In the present case, vitamin C was administered as part of the implemented nutritional regimen, while supplementation with vitamin D, zinc, and selenium was recommended according to ESPEN 2022 guidance to optimize immune function and support recovery. Nutritional interventions are evaluated periodically through monitoring the patient's clinical condition, laboratory parameters, and ability to accept and maintain the prescribed nutritional intake. These evaluation results are used to adjust the nutritional strategy throughout the treatment period until the patient's condition shows significant clinical improvement and is deemed stable enough for discharge.

3. Results

A 24-year-old woman presented to the Emergency Department (ER) of Bali Mandara Regional Hospital on December 26, 2025, with a primary complaint of high fever that had persisted for four days prior to admission. The fever was accompanied by pain throughout the body and joints, worsening weakness, and gastrointestinal complaints in the form of watery diarrhea twice on the day of admission. The patient also complained of nausea, vomiting, and decreased appetite that had occurred two days prior to admission. Based on her medical history, the patient had been diagnosed with systemic lupus erythematosus (SLE) since 2023 and had been receiving regular treatment.

On initial physical examination in the emergency room, the patient appeared to be in a critically ill condition with compos mentis consciousness and a Glasgow Coma Scale (GCS) score of E4V5M6. Vital signs revealed an axillary temperature of 40.1°C, indicating a high fever, a pulse rate of 158 beats per minute, indicating tachycardia, a blood pressure of 94/61 mmHg, indicating hypotension, a respiratory rate of 20 breaths per minute, and an oxygen saturation of 99% on room air. These findings suggest a severe systemic infection with hemodynamic compromise leading to septic shock.

Anthropometric examination revealed the patient's weight was 47 kg and her height was 170 cm. Based on this data, a body mass index (BMI) of 16.26 kg/m² was obtained, which is considered severely underweight. The patient's ideal body weight was calculated as 63 kg, indicating a significant weight deficit compared to her ideal body weight. This condition indicates a possible pre-existing nutritional problem prior to the patient's current clinical deterioration.

Initial laboratory tests revealed several abnormalities that suggested a systemic infection and hematologic disturbances. Hemoglobin levels were recorded at 10.5 g/dL, indicating mild anemia. The leukocyte count increased to $13.57\times10^3/\mu L$, indicating leukocytosis in response to the infection. Thrombocytopenia was also detected, with a platelet count of $55\times10^3/\mu L$. Renal function tests revealed an increase in urea to 66 mg/dL and creatinine to 1.55 mg/dL, indicating acute renal impairment likely related to sepsis.

Electrolyte disturbances were also found in initial laboratory tests. A serum sodium level of 126 mmol/L indicated hyponatremia, while a serum potassium level of 3.4 mmol/L indicated mild hypokalemia. Serum protein examination revealed an albumin level of 3.6 g/dL. Inflammatory markers were significantly elevated, with procalcitonin >200 ng/mL. A neutrophil-to-lymphocyte ratio (NLR) of 10.7 indicated a severe systemic inflammatory response.

To identify the source of the infection, blood cultures were performed from two sampling sites. The blood cultures confirmed the growth of Granulicatella elegans as the causative pathogen. This finding confirmed the diagnosis of a systemic bacterial infection as the cause of the patient's septic shock.

Nutritional status was assessed on the first day of treatment using the Nutritional Risk Screening 2002 (NRS-2002) nutrition screening method. The assessment showed a total score of 6, indicating a risk of severe malnutrition and requiring immediate nutritional intervention. Based on these screening results, a nutritional diagnosis of severe malnutrition with inadequate oral intake was established in a critically ill patient.

Based on a comprehensive clinical evaluation, the patient was diagnosed with septic shock, with a differential diagnosis of severe flare SLE. The patient was then admitted to the High Care Unit (HCU) for close monitoring and intensive management. Therapy included fluid resuscitation for hemodynamic stabilization, the broad-spectrum antibiotic meropenem at a dose of 1 gram intravenously three times daily, and immunosuppressive therapy in the form of intravenous methylprednisolone, increased from 2×62.5 mg to 2×125 mg per day.

Nutritional interventions begin on the first day of treatment as part of a multidisciplinary approach for critically ill patients. The patient's energy requirement is targeted at 2,200 kcal per day. Initial protein intake is 60 grams per day and is then gradually increased to 95 grams per day by the fourth day of treatment, equivalent to approximately 1.5 g/kg of ideal body weight per day. Nutrition is administered orally in the form of soft foods, with a frequency of three main meals and two snacks per day.

In addition to macronutrient interventions, guideline-based micronutrient supplementation encompassing vitamin C, vitamin D, zinc, and selenium in accordance with ESPEN 2022 recommendations plays an essential role in modulating immune responses and supporting clinical recovery. In this case, vitamin C was administered at a dose of 100 mg per day as part of the nutritional support regimen for systemic infection. Daily dietary intake was monitored to evaluate the patient's ability to meet the established nutritional targets.

During treatment, several laboratory parameters showed dynamic changes. The patient's platelet count decreased, reaching its lowest point on the fourth day of treatment at $8\times10^3/\mu L$. During the same period, procalcitonin levels decreased to 85.71 ng/mL, indicating a response to the infection therapy. Albumin levels

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also decreased to 2.8 g/dL, likely related to the acute phase response during the systemic inflammatory process.

To address the patient's anemia, a single packed red cell transfusion was administered throughout the treatment period. Monitoring of nutritional intake showed a gradual increase in response to the patient's clinical improvement. By the fourth day of treatment, the patient was able to meet approximately 65% of her daily energy needs, increasing to approximately 70% by the fifth day.

The patient's clinical improvement was observed gradually over the seven days of hospitalization. The fever began to resolve on the fourth day of treatment, while gastrointestinal symptoms such as nausea, vomiting, and diarrhea also improved. The patient's hemodynamics became more stable as he responded to the therapy. On the fifth day of treatment, the patient's condition was deemed stable enough to allow him to be transferred from the High Care Unit (HCU) to a regular ward. Follow-up monitoring showed an overall improvement in his clinical condition until the end of the treatment period.

The patient was finally discharged on January 1, 2026, after a total of seven days in the hospital. At the time of discharge, the patient's vital signs were within normal limits, with a blood pressure of 109/79 mmHg, a pulse rate of 72 beats per minute, and a body temperature of 36.5°C. The final laboratory test revealed a platelet count of $59\times10^3/\mu L$ and a hemoglobin level of 10.4 g/dL.

Upon discharge, the patient was given follow-up therapy in the form of oral methylprednisolone at a dose of 16 mg three times daily with a planned dose taper, omeprazole 20 mg twice daily, and regular check-ups. The patient was also scheduled for follow-up at the rheumatology clinic at Prof. Ngoerah General Hospital for regular monitoring of SLE and nutritional status.

4. Conclusion

This case illustrates the complexity of managing a patient with systemic lupus erythematosus (SLE) presenting with a severe flare complicated by septic shock due to Granulicatella elegans infection and severe malnutrition. The immunocompromised state of SLE patients increases susceptibility to opportunistic bacterial infections that are rarely detected by routine cultures. These findings underscore the importance of comprehensive clinical and microbiological evaluation in establishing a diagnosis of infection in SLE patients, particularly in the setting of severe sepsis, which requires prompt and appropriate treatment.

In addition to adequate medical therapy, early and structured nutritional intervention is a crucial component in the management of critically ill patients. Nutritional status assessment using standardized screening tools, determination of appropriate energy and protein targets, and guideline-based micronutrient supplementation encompassing vitamin C, vitamin D, zinc, and selenium in accordance with ESPEN 2022 recommendations each play an essential role in supporting clinical recovery. A multidisciplinary approach integrating optimal medical management with comprehensive nutritional support, including targeted micronutrient supplementation, has been demonstrated to contribute to significant clinical improvement and represents a key determinant of outcomes in SLE patients complicated by sepsis.

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