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Case Report

Successful Management Strategies for Lupus Nephritis in the Intensive Care Unit: A Case Series

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ABSTRACT

Lupus nephritis, a severe complication of systemic lupus erythematosus (SLE), often leads to significant renal impairment requiring intensive care. The management of lupus nephritis in the intensive care unit of Dr. Soetomo General Hospital extends to various patient populations, including adult patients undergoing hemodialysis and lupus nephritis with sepsis. The management of lupus nephritis entails not only renal complications but also the challenges associated with hemodialysis. Close monitoring of fluid and electrolyte balance is essential, along with adjustments in dialysis parameters to optimize renal function and prevent further complications. Additionally, we may need to tailor immunosuppressive therapy to the patient's renal replacement therapy regimen, taking into account the potential impact on drug clearance and toxicity. Patients with SLE undergoing immunosuppressive therapy are also at risk of developing infections, which can progress to sepsis and require more intensive care. Treatment of lupus nephritis in ICU generally necessitates intensive care, which includes hemodialysis and sepsis control.

Introduction

SLE or Systemic Lupus Erythematosus, an autoimmune disease, transcends its initial dermatological presentation to affect multiple organs. Among its significant manifestations is lupus nephritis (LN), kidney involvement that warrants vigilant monitoring. Serial assessments of creatinine, urine albumin-to-creatinine ratio, and urinalysis guide early detection and management [1-2].

Approximately a quarter of patients with SLE are hospitalized each year because of associated medical comorbidities, infection, and side effects of immunosuppressive therapies. SLE flare-up presented with protean clinical manifestations was another important cause of ICU admission. Other etiologies of ICU admission for patients with SLE were acute renal failure, pulmonary involvement, cardiovascular disease, central nervous system (CNS) involvement, and multi-organ failure (MOF) [3-4].

Case Report

Case 1

An 18-year-old female patient came to the emergency room at Soetomo Hospital with complaints of shortness of breath since last week, which has worsened in the past day. The patient had been experiencing fever for two days prior to arriving at the hospital. The patient was known to have a history of CKD Stage V on regular HD. While in the emergency room, the patient's condition worsened as consciousness decreased and oxygen saturation decreased.

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The patient was diagnosed with Systemic Lupus Erythematosus, CKD on Regular HD, acute lung edema, anemia, and hyperkalemia. The patient received the following treatments: IVFD NaCl 0.9% 100ml/24 hours, IV Methylprednisolone 62.5mg/24 hours, IV Metamizole 1g/8 hours, SP Dexmedetomidine 0.4mcg/kgBW/hour, SP NE 100 Nano/kgbb/min, po Myfortic 20mg/24 hours, po Simvastatin 20mg/24 hours, and po Allupurinol 100mg/24 hours. The hospital treated the patient for 8 days, and the Intensive Care Unit used a ventilator for 5 days. Hemodialysis was carried out on the patient, accompanied by a combination of medications.

Case 2

A 21-year-old female patient came to the hospital with complaints of shortness of breath accompanied by chest pain, nausea and vomiting, fever, diarrhea, and swelling in both legs since one month ago. Beyond that, the patient complained of stomach pain and enlargement. The patient has a history of SLE, which is currently under control. Upon examination of the lungs, it was found that both lung fields had crackles. The patient was intubated and used a PSIMV-mode ventilator.

The patient was hospitalized for 18 days with treatment in the HCU. We performed routine chest x-rays along with blood and sputum cultures. Routine chest X-rays showed diffuse opacities in both lungs. It was found that the patient was sensitive to Amikacin, Aztreonam, Cefepime, Cefoperazone-Sulbactam, Ceftazidime, Gentamicin, Imipenem, and Levofloxacin in the sputum culture. The patient's condition has improved. The patient was diagnosed with SLE, pneumonia, sepsis, massive pleural effusion, AKI related to lupus nephritis and sepsis, anemia, cardiomegaly, and hypoalbumin.

Discussion

Essentially, the primary objective in managing patients with systemic lupus erythematosus (SLE) and lupus nephritis is to hinder the advancement of kidney damage by regulating the inflammatory process in the kidneys, reducing the occurrence of disease flare-ups, and limiting any harmful effects on the kidneys caused by treatment. The optimal approach for treating lupus nephritis is determined by evaluating the patient's clinical condition, the findings of supporting tests, and the classification of the kidney biopsy [5].

In cases of end-stage kidney damage, kidney replacement therapy will be needed. Dialysis or kidney transplantation can increase the 5-year survival rate in lupus nephritis patients to 60%-70% [6]. The early death of lupus patients having hemodialysis is more frequently caused by infection rather than active disease. It is strongly advised that lupus nephritis patients with fluid retention issues have regular dialysis. Hemodialysis remains a frequently chosen option in the treatment of acute kidney injury (AKI) and chronic renal failure, alongside peritoneal dialysis and kidney transplantation. In the case of unstable hemodynamics, a decrease in the ultrafiltration rate per hour results in an increase in the required dialysis duration [7].

Infection causes 30 to 55% of all deaths in lupus nephritis. Risk factors for infection include high SLE activity, major organ disease (especially nephritis), persistent leukopenia (neutrophil count <500/mm³ or lymphocyte count <500/mm³), low serum albumin levels, use of moderate to high doses of glucocorticoids, and use of cytotoxic drugs recently (in the last 6 months) [8-9]. Infection is also a major cause of death in lupus nephritis patients undergoing renal replacement therapy, especially if they are receiving high doses of glucocorticoids or immunosuppressive medications at the time of dialysis initiation. Several recommendations that can be made to minimize the potential for infection include minimizing exposure to medium-high doses of glucocorticoids; compliance with hygiene measures by patients and healthcare professionals; antimicrobial prophylaxis in high-risk patient groups such as those receiving severe immunosuppression or undergoing invasive procedures associated with bacteremia; and compliance with recommended immunization schedules [8].

Provision of mechanical ventilation in lupus nephritis patients with respiratory failure must be adjusted to the underlying medical condition and clinical findings in the patient, which can fluctuate. Lupus nephritis patients with acute respiratory failure require intensive treatment in the Intensive Care Unit. Ensuring an adequate airway is very important in conditions like this, which is one of the indications for intubation [10]. Once the airway is secure, subsequent management focuses on correcting hypoxemia, with a target arterial oxygen pressure (PaO_2) of more than 60 mmHg or arterial oxygen saturation (SaO_2) of more than 90%. [11]. Oxygen supplementation in severe hypoxemia often requires intubation and mechanical ventilation. Mechanical ventilation is expected to reduce respiratory effort and the high oxygen consumption needed to maintain respiratory effort [12-13].

Provision of ventilator assistance is very necessary, but if the patient's condition improves, weaning can be carried out, namely a transition process for patients who are expected to be able to breathe spontaneously after being given mechanical ventilation [14]. It should be remembered that timely weaning is very important in treating patients in the ICU. Delay in removing the ventilator can cause VAP (ventilator-acquired pneumonia) and other side effects from installing a ventilator. Removing the ventilator too quickly can prolong the patient's length of stay in the ICU or result in death [12-13]. This case report is limited by its focus on a single patient, which may not comprehensively reflect the variability in lupus nephritis presentations and responses to treatment.

Conclusion

Lupus nephritis requiring hemodialysis or complicated by sepsis represents critical challenges in SLE

management. Hemodialysis provides essential support in severe renal impairment, while sepsis exacerbates complications, necessitating prompt, aggressive treatment. Early intervention, vigilant monitoring, and a multidisciplinary approach are crucial to improving outcomes in these life-threatening conditions.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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