COMPREHENSIVE MANAGEMENT OF NEPHROTIC SYNDROME AND LUPUS NEPHRITIS IN A PATIENT WITH MULTIPLE COMORBIDITIES : A CASE REPORT

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ABSTRAK

Laporan kasus ini membahas manajemen komprehensif pasien perempuan berusia 62 tahun yang didiagnosis dengan sindrom nefrotik, yang rumit dengan berbagai penyakit penyerta. Pasien datang dengan proteinuria signifikan dan urin berbusa, yang merupakan indikator utama sindrom nefrotiknya. Biopsi ginjal mengonfirmasi nefritis lupus, dan intervensi farmakologis berikutnya termasuk kortikosteroid, imunosupresan (Myfortic), insulin, antihipertensi (Ramipril), dan agen penurun lipid (Simvastatin), yang bertujuan untuk mengatasi masalah kesehatan multifaktorialnya. Meskipun pengobatan agresif, pasien terus menunjukkan kadar kreatinin dan proteinuria yang berfluktuasi, yang menunjukkan insufisiensi ginjal yang berkelanjutan. Kasus ini menyoroti kompleksitas pengelolaan pasien dengan berbagai kondisi kronis, yang memerlukan penyesuaian dinamis dalam pengobatan berdasarkan hasil klinis dan laboratorium. Tidak adanya riwayat keluarga dan psikososial yang terperinci dicatat sebagai keterbatasan dalam kasus ini, yang dapat memberikan wawasan lebih jauh tentang perkembangan penyakit. Pada akhirnya, laporan ini menggarisbawahi pentingnya pendekatan multidisiplin untuk mengelola sindrom nefrotik dan nefritis lupus, terutama bila disertai dengan gangguan metabolik lain seperti diabetes dan hipertensi.

Kata kunci **:** diabetes melitus, gagal ginjal, hipertensi, nefritis lupus, sindrom nefrotik

ABSTRACT

This case report discusses the comprehensive management of a 62-year-old female patient diagnosed with nephrotic syndrome, complicated by with Multiple Comorbidities. The patient presented with significant proteinuria and foamy urine, which were key indicators of her nephrotic syndrome. A kidney biopsy confirmed lupus nephritis, and subsequent pharmacological interventions included corticosteroids, immunosuppressants (Myfortic), insulin, antihypertensive (Ramipril), and lipid-lowering agents (Simvastatin), aiming to address her multifactorial health issues. Despite aggressive treatment, the patient continued to exhibit fluctuating creatinine levels and proteinuria, indicating ongoing renal insufficiency. This case highlights the complexity of managing patients with multiple chronic conditions, requiring dynamic adjustments in treatment based on clinical and laboratory results. The absence of a detailed family and psychosocial history is noted as a limitation in this case, which could have provided further insights into disease progression. Ultimately, the report underscores the importance of a multidisciplinary approach to managing nephrotic syndrome and lupus nephritis, particularly when compounded by other metabolic disorders such as diabetes and hypertension.

Keywords ***:*** *nephrotic syndrome, lupus nephritis, renal insufficiency, diabetes mellitus, hypertension*

INTRODUCTION

Nephrotic syndrome is a kidney disorder that occurs when the kidneys' filtering units, known as glomeruli, are damaged, leading to a range of clinical manifestations. The hallmark of nephrotic syndrome is significant proteinuria, where an excessive amount of protein, particularly albumin, is lost in the urine. This protein loss exceeds the body’s ability to compensate, resulting in hypoalbuminemia. Albumin plays a crucial role in maintaining the

oncotic pressure in the blood vessels; thus, its depletion causes edema, or swelling, particularly in areas like the legs, abdomen, and face, due to fluid leakage into the surrounding tissues.[1–3] In response to the decreased protein levels, the liver compensates by increasing lipid production, leading to hyperlipidemic. These metabolic abnormalities collectively result from the damage to the glomeruli, which under normal conditions, prevent large molecules like proteins from passing into the urine. In nephrotic syndrome, the glomerular filtration barrier is compromised, permitting protein leakage (LU, et al., 2024) (Toth, et al., 2023) (Gulumsek, et al., 2023).

Nephrotic syndrome can occur as a primary disorder, but it is frequently secondary to systemic diseases. One of the most significant causes is lupus nephritis, which is a serious renal complication of systemic lupus erythematosus (SLE). SLE is an autoimmune disease where the body's immune system attacks its own tissues, including the kidneys. Approximately 40% of SLE patients affected by lupus nephritis, making it one of the leading causes of renal morbidity and mortality in this population. Lupus nephritis occurs when immune complexes deposit in the kidneys, triggering inflammation and damaging the glomeruli, which in turn can lead to nephrotic syndrome. The progression of lupus nephritis often dictates the long-term renal prognosis in patients with SLE, and it requires close monitoring and aggressive treatment to prevent renal failure (Lu, et al., 2024) (Christiansen, et al., 2014) (Nakayama, et al., 2024).

In patients with multiple comorbidities, such as hypertension, type II diabetes mellitus, and hypercholesterolemia, the management of nephrotic syndrome becomes even more complex. Diabetes is known to exacerbate renal damage through mechanisms such as hyperglycemia-induced glomerular injury, while hypertension accelerates renal decline via increased pressure on the delicate glomerular filtration system. These conditions, in combination with nephrotic syndrome, create a challenging therapeutic environment, requiring a multidisciplinary approach that includes blood pressure control, glycemic management, and renal protection (Lu, et al., 2024) (Zhao, et al., 2018) (Yokoyama, et al., 2020). The following case report details the management of a 62-year-old female patient diagnosed with nephrotic syndrome secondary to lupus nephritis. The case highlights the challenges of managing a patient with multiple chronic conditions and emphasizes the importance of a dynamic, individualized treatment approach. Through careful pharmacologic interventions and continuous monitoring, the report demonstrates how multidisciplinary care can be applied to mitigate the impact of these intersecting diseases on renal function and overall patient health.

CASE REPORT

A 62-year-old female patient presents with a primary diagnosis of nephrotic syndrome, complicated by lupus nephritis Class III, type II diabetes mellitus, hypertension, hypercholesterolemia, and renal insufficiency. She has a history of significant proteinuria and foamy urine, which are being managed as part of her ongoing treatment for lupus nephritis. The patient’s family and psychosocial history were not detailed in the medical record. Her main symptom is foamy urine, indicating significant proteinuria, and she is under continued management for nephrotic syndrome and related comorbidities. The patient has a history of nephrotic syndrome, lupus nephritis Class III, type II diabetes mellitus, hypertension, and renal insufficiency. However, no family history or psychosocial information was provided. In terms of past interventions, the patient underwent a kidney biopsy that confirmed the diagnosis of lupus nephritis. She has been treated with pharmacologic interventions, including corticosteroids (methylprednisolone) and immunosuppressants (Myfortic), alongside other medications for managing her diabetes, hypertension, and hypercholesterolemia. Upon physical examination, her vital signs showed a blood pressure of 164/82 mmHg, respiratory rate of 20 breaths/min, pulse rate of 77 beats/min, and SpO2 at 99%. Laboratory tests revealed

a creatinine level of 2.0 mg/dL, blood glucose of 268 mg/dL, hemoglobin of 10.9 g/dL, and ureum of 81 mg/dL. Further lab findings showed positive proteinuria (2+), increased potassium levels (5.7 mmol/L), and elevated LDL cholesterol (147 mg/dL).

The diagnosis of the patient was confirmed through laboratory tests, which included assessments of proteinuria, creatinine, ureum, and glucose levels, alongside imaging and a kidney biopsy. The main challenge in managing the patient's condition stemmed from the complexity of her multiple comorbidities, such as lupus nephritis, diabetes, and hypertension, which required a multifaceted therapeutic approach. The primary diagnosis was nephrotic syndrome, secondary to lupus nephritis, with additional diagnoses of hypertension, type II diabetes mellitus, and hypercholesterolemia. Given the presence of renal insufficiency and chronic comorbidities, the patient's long-term prognosis remains guarded. Therapeutic interventions primarily involved pharmacological management, including the administration of Myfortic (an immunosuppressant), Novorapid (insulin), Ramipril (an ACE inhibitor), Simvastatin (a cholesterol-lowering agent), and Calcium Polystyrene Sulfonate for managing hyperkalemia. These medications were administered according to standard medical protocols. Changes in the therapeutic regimen were made as needed based on clinical responses and laboratory results, particularly in controlling blood pressure, glucose levels, and renal function. During follow-up, clinician-assessed outcomes indicated that the patient continued to experience proteinuria and fluctuating creatinine levels, which pointed to persistent chronic renal insufficiency. Despite this, the patient demonstrated adherence to the prescribed therapeutic regimen without major issues in medication tolerance. There were no significant adverse events, although the patient's renal function remains progressively compromised due to the underlying conditions.

DISCUSSION

Managing patients with nephrotic syndrome, lupus nephritis, and associated comorbidities such as type II diabetes mellitus, hypertension, and hypercholesterolemia presents unique challenges. The treatment plan was tailored to address both the primary renal condition and the co-existing metabolic disorders. Strengths in the approach included the thorough diagnostic process, the integration of multiple pharmacological interventions, and consistent monitoring of the patient’s clinical and laboratory results. However, the lack of detailed family and psychosocial history represented a limitation, as it could have offered valuable insights into hereditary or environmental factors influencing disease progression (Samudra, et al., 2022) (Go, et al., 2021) (Krishnamoorthy, et al.,2015)

Type II diabetes mellitus plays a crucial role in exacerbating renal damage. Chronic hyperglycemia, or elevated blood glucose levels, leads to glomerular injury through several mechanisms, including the thickening of the glomerular basement membrane, increased oxidative stress, and the accumulation of advanced glycation end products (AGEs). These pathological changes reduce the kidney's ability to filter blood effectively, leading to further proteinuria and accelerating the progression of nephrotic syndrome (Samudra, et al., 2022) (Kelddal, et al., 2022) (Mohamed, et al., 2022). Hypertension compounds the renal damage by exerting excessive pressure on the delicate glomerular filtration system. Persistent high blood pressure forces the kidneys to work harder, causing additional strain on the glomeruli and contributing to structural damage. Over time, this increased pressure leads to glomerulosclerosis, where the glomeruli harden and lose functionality. Without proper blood pressure control, nephrotic syndrome can worsen, hastening the decline in kidney function and increasing the risk of chronic kidney disease or end-stage renal disease (ESRD) (Jönsson, et al., 2021) (Lin, et al., 2020) (Sreelatha, et al., 2019) Hypercholesterolemia also plays a key role in the progression of nephrotic syndrome. The elevated lipid levels commonly seen in nephrotic

syndrome, worsened by comorbid hypercholesterolemia, increase the risk of atherosclerosis and cardiovascular disease. Moreover, the excess lipids can contribute to further glomerular damage through lipid accumulation within the kidneys, aggravating renal dysfunction (Roca, et al., 2021) (Alamilla-Sanchez, et al., 2022) (Verma & Patil, 2024). Managing nephrotic syndrome in patients with comorbidities requires a multidisciplinary approach. Blood pressure control is essential and is often achieved using angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs), which not only reduce blood pressure but also have a protective effect on the kidneys by reducing proteinuria. Effective glycemic control through insulin or oral hypoglycemic agents is critical to limit hyperglycemia-induced renal damage. Additionally, lipid-lowering therapies, such as statins, are crucial for managing hypercholesterolemia and reducing the risk of cardiovascular complications (Jönsson, et al., 2023)

Renal protection strategies also include careful monitoring of renal function, dietary modifications (such as reducing sodium and protein intake), and possibly the use of diuretics to manage edema. Overall, this complex therapeutic landscape highlights the importance of an individualized and coordinated treatment plan that addresses each comorbidity while prioritizing the preservation of kidney function (Samudra, et al., 2022) (Wright & Gilchrist, 2023) (Yoshida, et al., 2024). One key challenge in this case was the ongoing management of proteinuria and fluctuating creatinine levels, which suggested progressive renal insufficiency. Despite the use of immunosuppressants and antihypertensive therapy, the patient's renal function remained compromised, indicating that the combination of nephrotic syndrome, lupus nephritis, and diabetes creates a scenario of chronic, progressive renal injury. This highlights the importance of frequent monitoring and dynamic adjustment of therapy to accommodate changes in the patient's clinical status. As renal function declines, clinicians must balance the benefits and risks of long-term immunosuppressive therapy, given its potential for adverse effects such as increased infection risk and further metabolic complications (Lu, et al., 2024) (Yoshida & Sunami, 2024) (Fahmi, et al., 2012)

CONCLUSION

This case underscores the complexity of managing nephrotic syndrome secondary to lupus nephritis, especially in the presence of multiple comorbidities. A multidisciplinary approach, incorporating immunosuppressive therapy, blood pressure control, glycemic management, and lipid regulation, is essential to address the various aspects of these interconnected conditions. Despite aggressive treatment, the patient continued to exhibit signs of progressive renal insufficiency, highlighting the chronic nature of these diseases. Continuous monitoring and dynamic adjustments to therapy are crucial in improving patient outcomes and preventing further renal deterioration. This case emphasizes the need for individualized care plans tailored to the complexity of each patient's unique clinical scenario.

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