

# Lupus Nephritis in Childhood: A Case Report Highlighting the Challenges of Disease Management

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**Abstract:-Background:** Lupus nephritis (LN) is a severe manifestation of systemic lupus erythematosus (SLE), affecting renal function through immune complex deposition. While it is more common in adults, pediatric lupus nephritis presents aggressive courses, often requiring immunosuppression and dialysis.

**Case Presentation:** A 14-year-old female with a history of SLE presented with progressive renal failure, uncontrolled hypertension, and generalized edema. Laboratory tests confirmed lupus nephritis (Class IV), leading to end-stage kidney disease (ESKD). Despite aggressive immunosuppressive therapy, she required urgent hemodialysis initiation due to worsening renal function. The management included antihypertensive therapy, steroids, and mycophenolate mofetil, but her dependency on dialysis persisted.

**Conclusion:** Pediatric lupus nephritis poses significant diagnostic and therapeutic challenges. Early recognition, aggressive treatment, and optimal blood pressure control are crucial to improve outcomes. This case highlights the need for individualized management and long-term follow-up in pediatric LN patients.

## INTRODUCTION

Lupus nephritis (LN) is a severe renal complication of systemic lupus erythematosus (SLE), affecting approximately 50–60% of pediatric lupus patients. Compared to adults, pediatric-onset SLE presents with more aggressive renal involvement, leading to early progression to chronic kidney disease (CKD) and end-stage kidney disease (ESKD). Uncontrolled hypertension further complicates the disease course, increasing morbidity and mortality.

This report describes a case of a 14-year-old female with severe lupus nephritis who progressed to dialysis dependency, emphasizing the challenges in disease management and blood pressure control.

### Case Presentation

A 14-year-old female with a history of SLE presented with progressive renal failure, uncontrolled

hypertension, and generalized edema. Laboratory tests confirmed lupus nephritis (Class IV), leading to end-stage kidney disease (ESKD). Despite aggressive immunosuppressive therapy, she required urgent hemodialysis initiation due to worsening renal function. The management included antihypertensive therapy, steroids, and mycophenolate mofetil, but her dependency on dialysis persisted. On examination, she had generalized edema (anasarca), Hypertension (poorly controlled despite antihypertensive medications), Pallor and fatigue, Mild pericardial rub on auscultation

### Diagnostic Workup

**Blood Tests:** Elevated creatinine (5.2 mg/dL), urea (85 mg/dL), hypoalbuminemia, and hyperkalemia.

**Urinalysis:** Heavy proteinuria (nephrotic-range >4.5g/day), microscopic hematuria.

**Autoimmune Markers:** Positive ANA, anti-dsDNA, low complement (C3, C4).

**Renal Biopsy:** Proliferative lupus nephritis (Class IV, ISN/RPS classification) with crescents and tubulointerstitial fibrosis.

**Echocardiography:** Mild pericardial effusion.

**Clinical Course and Management:** Due to worsening kidney function, she was started on urgent hemodialysis and aggressive antihypertensive therapy (amlodipine, labetalol, and ACE inhibitors). Immunosuppression was intensified with IV methylprednisolone pulses, followed by mycophenolate mofetil (MMF) and hydroxychloroquine. Despite therapy, dialysis dependency persisted, and she required long-term hemodialysis.

## DISCUSSION

Lupus nephritis in pediatric patients is often more aggressive than in adults, with a higher risk of hypertension, ESKD, and dialysis dependency<sup>1</sup>. The interplay of autoimmunity, persistent inflammation, and renal injury contributes to rapid disease

progression<sup>2</sup>. Delayed or ineffective treatment further increases the risk of dialysis, especially when children do not respond well to immunosuppressive therapies. Frequent disease flares are another major concern, as repeated inflammation progressively weakens kidney function. Genetic and racial factors also play a role, with African American and Hispanic children at a higher risk of severe disease progression. Furthermore, prolonged use of steroids and other immunosuppressants can lead to infections and other complications that indirectly worsen kidney function.

Once pediatric LN patients reach dialysis, their outcomes are often worse compared to those with other causes of kidney failure. They face a higher risk of cardiovascular complications and lower survival rates. While kidney transplantation is an option, lupus can recur in the new kidney, and ongoing inflammation may lead to transplant rejection. Managing pediatric LN effectively requires early diagnosis, aggressive treatment, and close monitoring to reduce the likelihood of dialysis dependency.

#### Key Challenges in Management:

1. Hypertension Control: Resistant hypertension requires multimodal therapy to prevent cardiovascular complications<sup>2</sup>.
2. Immunosuppressive Therapy: Despite steroids and MMF, some patients progress to ESKD, requiring alternative therapies like rituximab or cyclophosphamide<sup>3</sup>.
3. Dialysis Dependence: Early identification of non-responders to immunotherapy is crucial to optimizing renal outcomes<sup>5</sup>.
4. Long-term Prognosis: Pediatric patients face increased risks of CKD progression, cardiovascular disease, and treatment-related complications<sup>4</sup>.

#### CONCLUSION

Managing pediatric lupus nephritis (LN) requires a multidisciplinary approach, involving nephrologists, rheumatologists, and other specialists to provide comprehensive care. Early diagnosis and aggressive treatment are critical in slowing disease progression and reducing the risk of dialysis dependency. Since hypertension significantly worsens kidney damage, strict blood pressure control is essential in preserving renal function. However, prolonged use of corticosteroids and immunosuppressants increases

the risk of infections, bone disease, and metabolic complications, necessitating careful monitoring to minimize treatment-related side effects. Given the variability in disease severity, personalized treatment strategies tailored to each patient's needs are crucial for achieving better outcomes. Regular follow-up with frequent clinical and laboratory assessments is necessary to detect relapses early and adjust treatment accordingly. In cases where kidney function continues to decline despite therapy, early planning for dialysis or kidney transplantation is essential to ensure a smooth transition to renal replacement therapy. Additionally, the psychosocial impact of chronic kidney disease and intensive treatments highlights the need for mental health support and patient education to improve overall quality of life. Advancements in research, including biologic therapies and precision medicine, offer hope for better disease control and improved survival in pediatric LN patients. Continued efforts in early intervention, optimized treatment, and supportive care will be key to enhancing long-term outcomes and reducing the burden of this challenging disease.

This case underscores the severity of pediatric lupus nephritis, especially when complicated by uncontrolled hypertension and dialysis dependency. Early diagnosis, aggressive treatment, and blood pressure optimization are essential to improving long-term outcomes<sup>3</sup>. Given the high relapse rates, close follow-up and consideration for renal transplantation are vital in managing these patients<sup>5</sup>.

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