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Case Report

Lupus Podocytopathy: How Much Do We Know?

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Abstract

Introduction: Lupus Nephritis (LN) is considered to be a classical form of immune complex glomerulonephritis. In rare cases, kidney biopsy findings in a patient with SLE are incompatible with classical LN and patient may present with rare glomerular lesions such as lupus podocytopathy(LP). We present a patient with lupus podocytopathy.

Case: A 53-year-old woman was admitted to nephrology outpatient clinic with swelling of the legs. Patient had bilateral pretibial edema and polyarthralgia. Serum creatinine was 0.77mg/dl, albumin was 22.9 g/l. Antinuclear antibody, anti double-stranded DNA antibodies were positive. Urine protein excretion rate was within nephrotic range (9862 mg/day). Renal biopsy revealed mild segmental mesangial cell increase in a few glomeruli. There were no findings suggestive of immune complex nephritis with immunofluorescence microscopy. Patient was diagnosed as SLE. Renal biopsy findings were compatible with lupus podocytopathy. Methylprednisolone was initiated.

Discussion: Kidney biopsy findings of LP are characterized by normal glomeruli or focal segmental glomerulosclerosis lesions, with or without mesangial proliferation on light microscopy. The absence of subepithelial or subendothelial deposits by immunofluorescence microscopy and effacement of podocyte foot processes by electron microscopy are also observed. LP patients usually present with nephrotic syndrome. There are no defined criteria for diagnosing LP except for kidney biopsy findings. In recent studies, LP has been considered in two subgroups as Minimal Change Disease (MCD) and Focal Segmental Glomerular Sclerosis (FSGS) according to kidney biopsy findings. MCD subgroup responds better than FSGS subgroup to glucocorticoid therapy alone and in this subgroup glucocorticoids can be used alone as induction therapy.

Introduction

Kidney involvement is common in patients with systemic lupus erythematosus (SLE) at the time of diagnosis(1). Glomerular disorders associated with SLE, known as lupus nephritis(LN) are classified into six different groups based upon the histopathological findings(2). LN is considered to be a classical form of immune complex glomerulonephritis. However, in rare cases, kidney biopsy findings in a patient with SLE are not compatible with classical type lupus nephritis and are evaluated as lupus podocytopathy(LP). Here, we aim to present a patient with LP and review literature.

Case Report

A 53-year-old woman was admitted to nephrology outpatient clinic with swelling of the legs and high blood pressure. Past medical history was remarkable for hypothyroidism, open mitral valve replacement and ischemic heart disease. Patient's medications included ramipril 5 mg 1x1, acetylsalicylic acid 100 mg 1x1, levothyroxine 25 mcg 1x1, enoxaparin 6000IU 1x1, benidipine hydrochloride 4 mg 1x1, quetiapine 25 mg 1x1, pantoprazole 40 mg 1x1. On examination; the patient's blood pressure was 170/90 mmHg, heart rate was 96 beats per minute. Patient had bilateral pretibial edema, crepitant crackles at base of the both lungs and arthralgia in the elbows, shoulders and knees.

Initial laboratory tests were as follows: urea 41mg/dl, creatinine 0.77mg/dl, eGFRcr 88 ml/min/1.73m^2, sodium 142mEq/l, potassium 4.15mEq/l, calcium 7.5mg/dl, phosphate 3.57 mg/dl, uric acid 4.3 mg/dl, albumin 22.9 g/l, total protein 59 g/l, hemoglobin 11.4 g/dl, mean corpuscular volume 89.4 fl, lym-

phocyte 1.5 10*3 u/L, neutrophil 2.32 10*3 u/L, highly sensitive C-reactive protein level 6.3mg/l, sedimentation 57mm/hour. Serologies were positive for antinuclear antibodies (1/1000-1/3200), anti double-stranded DNA (337 UI/ml) and anti-Ro/SSA antibodies. Serum complements 3 and complement 4 levels were normal. Isolated proteinuria (+3) was detected in urinalysis. Urine protein excretion rate was within nephrotic range (9862 mg/day). A renal biopsy was performed to determine the etiology of nephrotic range proteinuria. 31 glomeruli were observed in light microscopy; 3 of 31 glomeruli were globally sclerotic. Light microscopy revealed mild segmental mesangial cell increase in a few glomeruli and mild mononuclear cell infiltration including neutrophils in the interstitium. There was no finding suggestive of immune complex nephritis with immunofluorescence microscopy. Electron microscopy could not be performed due to technical insufficiencies. Patient was diagnosed as SLE according to clinical and laborotory findings. However, renal biopsy findings in the light microscope in the patient with nephrotic syndrome were not compatible with typical lupus nephritis and the glomerular appearance was close to normal. The patient was evaluated as lupus podocytopathy. The treatment was started with methylprednisolone(1 mg per kg) and intravenous furosemide. The patient was discharged since the oedema of legs regressed and her blood pressure was reduced to normal range. After 5 weeks, in the follow-up at outpatient clinic, complete remission in proteinuria was observed and the treatment was slowly tapered.

Discussion

Lupus nephritis is a classic form of immune complex glomerulonephritis called full-house pattern, characterized histopathologically by subendothelial, subepithelial and mesangial immune complex deposits. The most common clinical manifestation is proteinuria. In addition, other clinical manifestations of lupus nephritis such as microscopic hematuria, increased creatinine levels, development of nephrotic syndrome and hypertension may be observed [1,2]. However, in rare instances, kidney biopsy findings in SLE patients resemble the classical histological findings of minimal change disease(MCD). Such lesions have been termed "Lupus Podocytopathy" and are responsible for 1 to 2 percent of nephrotic patients with SLE [1,3]. The kidney biopsy findings of lupus podocytopathy are characterized by normal glomeruli or focal segmental glomerulosclerosis lesions, with or without mesangial proliferation on light microscopy [3]. In addition, the absence of subepithelial or subendothelial deposits by immunofluorescence microscopy and effacement of podocyte foot processes by electron microscopy are observed.

The patients with LP is usually present with nephrotic syndrome. Hypertension, microscopic hematuria or acute kidney disease are rare and are more common in the focal segmental glomerulosclerosis subtype of patients with LP [4].

Pathogenesis of LP is not explained by immune complex deposition. It is thought that direct antibody binding to podocyte slit diaphragm proteins, production of a toxic cytokine or lymphokine for podocytes, or podocyte injury caused by T cell dysfunction play a role in pathogenesis of this condition similar to minimal change disease (MCD) or focal segmental glomerulosclerosis (FSGS) [5].

There are no defined criteria for diagnosing LP except for kidney biopsy findings. In recent studies, LP has been considered in two subgroups as MCD and FSGS according to kidney biopsy findings. Mesangial proliferation is commonly observed in both MCD and FSGS subgroups. In addition, FSGS lesions can be categorized as not otherwise specified, perihilar, cellular, terminal or collapsing forms, in accordance with the classical classification of biopsy findings [4]. This distinction is important mainly in terms of treatment selection, prediction of recurrence frequency and prognosis. The FSGS subgroup has a worse prognosis; hypertension and acute kidney injury are seen more frequently than the MCD subgroup. The severity of tubulointerstitial involvement in renal biopsy is also higher than that in the MCD subgroup [3,4].

In terms of treatment response, MCD subgroup responds better than FSGS subgroup to glucocorticoid therapy alone and glucocorticoids can be used alone as induction therapy. Another immunosuppressive agents can be added to glucocorticoid therapy in relapsed cases or to reduce the frequency of relapse. As the FSGS subgroup is less responsive to steroid therapy alone, steroid treatment should be combined with other immunosuppressive agent such as mycophenolate mofetil, calcineurin inhibitors, cyclophosphamide, and rituximab [5]. Since our case was evaluated as the MCD subgroup of LP according to biopsy findings, steroid treatment alone was planned.

Conclusion

Here, we aimed to present a patient with lupus podocytopathy, a rare form of glomerular involvement of SLE, and to review the histopathological subgroups of LP and treatment options.

Informed Consent: Informed consent of the patient was obtained.

Conflict of interest: Nur Sena Çoban, Ege Sinan Torun, Fatma Zülal Özek, Çağlar Çakir and Gülay Koçak declare that they have no conflict of interest.

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