Pharmacogn J. 2022; 14(4): 459-461
A Multifaceted Journal in the field of Natural Products and Pharmacognosy
www.phcogj.com

Case Report

Nephrotic Syndrome with Focal Segmental Glomerulosclerosis Histological Feature: A Case Report

Dian Samudra[1,*], Widodo[2], Nunuk Mardiana[2], Artaria Tjempakasari[2], Pranawa[2], Aditiawardana[2], Anny Setijo Rahaju[3]

ABSTRACT

Introduction: Nephrotic syndrome is a clinical syndrome of heavy proteinuria and hypoalbuminemia or hypoproteinemia. Renal biopsy is fundamental to assess not only the type but also the degree of disease activity. The overall prognosis and response to treatment often depend on the severity of histological lesions and their reversibility.[1,2] **Case Presentation:** An eighteen years old man with nephrotic syndrome and planned for a kidney biopsy. This case showed a patient with swollen face (especially on the cheek). On Biopsy results showing the glomerulus proliferation of cells and mesangeal matrix, adhesions in (50%) glomerulus, focal sclerosis in some glomeruli, erythrocyte cells visible in the urinary space and thickening of the basement membrane in some glomeruli, partially atrophic tubules, visible erythrocytes in the tubular lumen. **Conclusion:** An eighteen years old man with nephrotic syndrome with cushing syndrome and hypokalemia who had a renal biopsy. The histological feature from the renal biopsy was focal segmental glomerulosclerosis. The underlying cause of FSGS is still unclear. Assessing the diagnosis and etiology become important to direct the subsequent clinical approach and therapy

Key words: Nephrotic syndrome, Focal segmental glomerulosclerosis, Renal biopsy.

Dian Samudra[1,*], Widodo[2], Nunuk Mardiana[2], Artaria Tjempakasari[2], Pranawa[2], Aditiawardana[2], Anny Setijo Rahaju[3]

[1]Internal Medicine Department, Faculty of Medicine, Universitas Airlangga, Surabaya, INDONESIA.

[2]Internal Medicine Department, Faculty of Medicine, Universitas Airlangga, General Teaching Hospital Dr. Soetomo, Surabaya, INDONESIA.

[3]Pathology Anatomy Department, Faculty of Medicine, Universitas Airlangga, General Teaching Hospital Dr. Soetomo, Surabaya, INDONESIA.

Correspondence

Dian Samudra

Internal Medicine Department, Faculty of Medicine, Universitas Airlangga, Surabaya, INDONESIA.

E-mail: diansamudra101@gmail.com

History

- Submission Date: 28-05-2022;
- Review completed: 19-06-2022;
- Accepted Date: 12-07-2022.

DOI : 10.5530/pj.2022.14.122

Article Available online

http://www.phcogj.com/v14/i3

INTRODUCTION

Nephrotic syndrome is a clinical syndrome of heavy proteinuria and hypoalbuminemia or hypoproteinemia, caused by increased permeability of serum protein which through the damaged basement membrane in the renal glomerulus. The definition of nephrotic syndrome includes massive proteinuria (3-3.5 g/day, or spot urine protein-creatinine ratio of 300-350 mg/mmol, or 3+ dipstick), hypoalbuminemia (serum albumin < 2.5 g/dl), and peripheral edema.[1,2] In adults incidence of nephrotic syndrome is three per 100,000 persons.[3] One of the primary glomerular diseases that can cause nephrotic syndrome is focal segmental glomerulosclerosis (FSGS).[4] FSGS is a histological pattern of glomerular lesion that includes several completely different clinicopathological diseases that share injury within the podocyte as a primary pathophysiological feature.[5] Early kidney biopsy in adults is critical to properly categorize the disease and direct the subsequent clinical approach.[6] Renal biopsy is fundamental to assess not only the type but also the degree of disease activity. The overall prognosis and response to treatment often depend on the severity of histological lesions and their reversibility.[1]

CASE REPORT

Clinical feature

An eighteen years old man with nephrotic syndrome and planned for a kidney biopsy. This case showed a patient with swollen face (especially on the cheek). Previously, the swollen was on his whole body since October 2020 started from lower extremities, went up to stomach, upper extremities, but already diminished and only remained on his face area urinating a lot, yellow and foamy. At first, patient had medical treatment at hospital, he was hospitalized for a week and was diagnosed with nephrotic syndrome. During medication he received furosemide, osteocal, myfortic, methylprednisolone, diovan, simvastatin, albumin and calcium lactate. Patient was drunk alcoholic beverages for the last 6 years almost every weekend and claims to have stopped drinking since before the symptoms of the disease appeared. On physical examination, there were visible edema on both of his palpebra and cheeks.

Laboratory findings

On laboratory findings, there were proteinuria +4, PCR >50 g/gCr, Esbach protein excretion 1.5g/24 hours, negative from hepatitis C virus and HIV, but the hepatitis B virus test was equivocal and from the peripheral blood smear showed of polycythemia vera. The elucidation of lesions of glomeruli mandates that a variety of histochemical stains be used and that tissue sections be cut thinner than for other tissues. In paraffin-embedded sections, hematoxylin and eosin stain does not ordinarily allow for distinction of extracellular matrix from cytoplasm in a clear or convincing manner. Periodic acid-Schiff (PAS), periodic acid-methenamine silver (Jones), and Masson's trichrome stains all provide excellent definition of extracellular material. On March 22nd 2021, biopsy results showing the glomerulus proliferation of cells and mesangeal matrix, adhesions in (50%) glomerulus, focal sclerosis in some glomeruli, erythrocyte cells visible in the urinary space and thickening of the basement membrane in some glomeruli, partially atrophic tubules, visible erythrocytes in the tubular lumen. The interstitial cells show lymphocytic infiltration of inflammatory cells. On immunofluorescence

Cite this article: Samudra D, Widodo, Mardiana N, Tjempakasari A, Pranawa, Aditiawardana, et al. Nephrotic Syndrome with Focal Segmental Glomerulosclerosis Histological Feature: A Case Report. Pharmacogn J. 2022;14(4): 459-461.

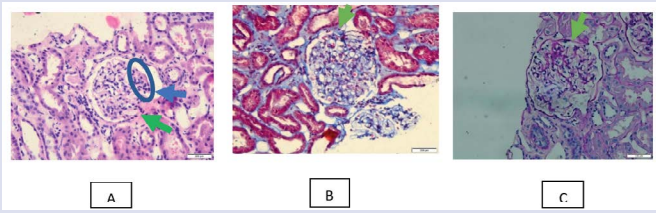


Figure 1: Kidney biopsy findings.
Biopsy results in patients with nephrotic syndrome who have received steroid therapy. Histopathological feature with several stains found indicates that kidney has Focal Segmental Glomerulo Sclerosi (FSGS). → Segmental sclerosis → Perihilar adhesion.
HE, 400x; B. Masson Trichome,400x; C. PAS, 400x.

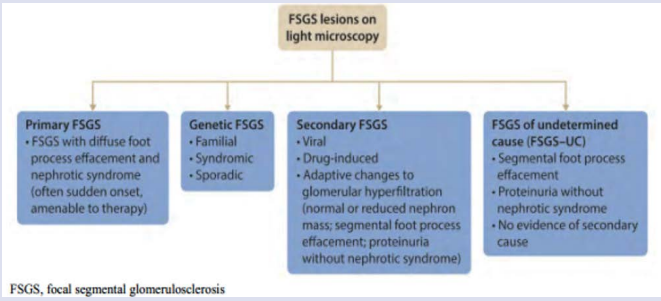


Figure 2: Proposed classification of FSGS.

Table 1:

	Frequency of disease (%) as a cause of nephrotic syndrome		
	1960s and 1970s		
Disease	Patients <60 years	Patients >60 years	1990s to the present
Focal segmental glomerulosclerosis	15	2	35
Membranous glomerular disease	40	39	33
Minimal change glomerular disease	20	20	15
Membranoproliferative glomerular disease (for example, IgA)	7	0	14
Other glomerular disease	18	39	3

examination of IgG, IgM, and IgA is negative, C3 and C1q also negative. The conclusion is Focal Segmental Glomerulosclerosis (Figure 1).

Clinical course

After ninth day of treatment, there is no complaints of pain, urine is clear. Consciousness compos mentis, blood pressure 103/67 mmHg, pulse 87 times/minute, regular, adequate contents, respiratory rate 20 BPM, SpO2 99% free air, axillary temperature 36 C, drinking 1200 ml/24 hours, infusion 1500cc/24 hours, urine output 1900 ml/24 hours. The patient was discharged with Methylprednisolone 16mg - 16mg - 8mg tapering down gradually, Furosemide 1x20mg, Myfortic 2x360mg, Diovan 1x80mg, Simvastatin 1x20mg, Osteocal 1x1.

DISCUSSION

Nephrotic syndrome is a clinical syndrome that includes massive proteinuria, hypoalbuminemia, and peripheral edema which caused by increased permeability of serum protein through the damaged basement membrane in the renal glomerulus.[7-11] This case showed a patient with swollen face (especially on the cheek). Previously of renal tubule, erythrocytes were shown on the lumen of renal tubule, lymphocyte inflammatory cell, the swollen was on his whole body since October 2020, but already diminished and only remained on his face area. Patient was hospitalized for a week and was diagnosed with Nephrotic Syndrome. On physical examination, there were visible edema on both of his palpebra and cheeks. On laboratory findings, there were proteinuria +4, PCR >50 g/gCr, and Esbach protein excretion 1.5g/24 hours. In adults, early kidney biopsy is fundamental to assess not only the type but also the degree of disease activity and also prognosis and response to treatment often depend on the severity of histological lesions and their reversibility.[1] Indications of renal biopsy are nephrotic syndrome, urine abnormalities (hematuria and proteinuria), AKI and CKD. Nephrotic syndrome is the most frequent indication for renal biopsy in adults. The presence of glomerulosclerosis, arteriosclerosis, and interstitial fibrosis are all suggestive of an irreversible process that is less likely to respond to treatment; conversely, the presence of active lesions potentially indicates good responsiveness to corticosteroid treatment. Patients with proteinuria ≥ 1 g/day would deserve renal biopsy for clarifying the nature of the underlying nephropathy and should periodically be followed if such levels persist over time.[12,13] On laboratory findings, there were hematuria with RBC 44.5/uL on urine sedimentation and proteinuria +4 on urinalysis. Also, there was proteinuria >1g/day which was measured on several visits: 1g/day on January 11th 2021 and increased 1.5g/day on March 6th 2021.

The renal biopsy result (March 22nd 2021) was Cell proliferation and mesangeal matrix were shown on glomerulus, adhesion (50%) was shown on glomerulus, focal sclerosis was shown on some parts of glomerulus, erythrocytes were shown on urinary space and the thickening of basement membrane was shown on glomerulus, atrophy on some parts ls were shown on the renal interstitial with conclusion is Focal Segmental Glomerulosclerosis. Immunofluorescence test result IgG, IgM, and IgA were negative, C3 and C1q was negative.

According to the etiology, FSGS lesion has been classified into primary, genetic, and secondary forms that include maladaptive, virus-associated, and medication-induced FSGS.[14,15]

Patient had a history of alcohol (arak) consumption since the last 6 years, almost every weekend, as much as approximately 1 big bottle (1-1.5L). The probability of alcohol consumption induced nephrotic syndrome can be excluded since there are no significant association between high alcohol consumption and risk for developing proteinuria. History of drugs or traditional herbal drink consumption was denied.[9] Distinguishing between the different forms is crucial since management must be tailored according to the underlying etiology.[16] From laboratory findings, patient test resulted negative from hepatitis C virus and HIV, but the hepatitis B virus test was equivocal, hence the test need to be repeated. We can also exclude autoimmune from suspected etiologies since the ANA test, C3, and C4 test results were within normal limit. The ASTO test was also negative; therefore, we can rule out post-streptococcal glomerulonephritis infection.

Adult patients with FSGS should receive the necessary supportive treatment as advised for all patients with persistent proteinuria, including the use of RAS blockade, optimal blood pressure control, and dietary salt restriction. Primary FSGS may respond to immunosuppressive treatment. On the other hand, maladaptive and secondary forms often present with sub-nephrotic proteinuria and progressive kidney insufficiency, do not respond to immunosuppression, and the treatment focuses in resolving the underlying cause.[2,5]

During medication he received furosemide, osteocal, myfortic, methylprednisolone, diovan, simvastatin, albumin and calsium lactate. KDIGO recommend that high-dose oral corticosteroids be used as

the first-line immunosuppressive treatment for primary FSGS. The recommended therapy is Prednisone 1mg/kg (maximum 80mg), continued by high dose corticosteroid therapy for at least 4 weeks and until complete remission is achieved, or maximum 16 weeks, whichever is earlier. When complete remission, continue for 4 weeks or 2 weeks after disappearance of proteinuria and reduce by 5 mg every 1-2 weeks to complete total duration of 6 months. And if partial remission within 8-12 weeks, then continue until 16 weeks, make sure whether further proteinuria or complete remission may occur and reduce by 5 mg every 1-2 weeks to complete total duration of 6 months. Calcineurin-inhibitor might also be used as treatment option for adults who may not tolerate prolonged high-dose corticosteroids well. Patients who have secondary FSGS due to an underlying disease process should be managed as required for the primary medical condition. There is no evidence or a priori rationale justifying the use of corticosteroids or other immunosuppressive drugs in this population, and the potential for harm of such treatment is clear.[2,5]

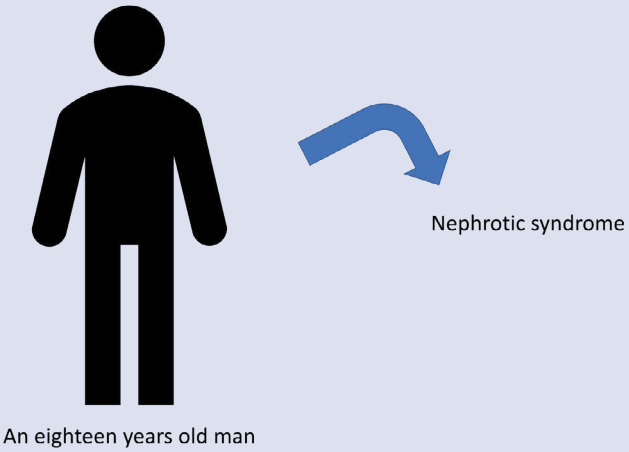
SUMMARY

An eighteen years old man with nephrotic syndrome with Cushing syndrome and hypokalemia who had a renal biopsy. The histological feature from the renal biopsy was focal segmental glomerulosclerosis. The underlying cause of FSGS is still unclear. Assessing the diagnosis and etiology become important to direct the subsequent clinical approach and therapy

REFERENCES

1. Hull RP, Goldsmith DJ. Nephrotic syndrome in adults. BMJ. 2008;336(7654):1185-9.
2. KDIGO. Clinical practice guideline on glomerular diseases. 2020.
3. Kodner C. Diagnosis and Management of Nephrotic Syndrome in Adults. Am Fam Physician. 2016;93(6):479-85.
4. Nishi S, Ubara Y, Utsunomiya Y, Okada K, Obata Y, Kai H, *et al.* Evidence-based clinical practice guidelines for nephrotic syndrome 2014. Clin Exp Nephrol. 2016;20(3):342-70.
5. Shabaka A, Ribera AT, Fernández-Juárez G. Focal Segmental Glomerulosclerosis: State-of-the-Art and Clinical Perspective. Nephron. 2020;144(9):413-27.
6. Canetta PAA, Radhakrishnan J. The Evidence-Based Approach to Adult-Onset Idiopathic Nephrotic Syndrome. Frontiers in Pediatrics. 2015;3:78.
7. Ansori ANM, Susilo RJK, Hayaza S, Winarni D, Husen SA. Renoprotection by Garcinia mangostana L. pericarp extract in streptozotocin-induced diabetic mice. Iraqi J Veterinary Sci. 2019;33(1).
8. Husen SA, Salamun, Ansori ANM, Hayaza S, Susilo RJK, Winarni D, *et al.* Renal Protective Effects of Gamma-Mangostin in Streptozotocin-Induced Diabetic Mice. Indian J Forensic Med Toxicol. 2020;14(3):1251-6.
9. Husen SA, Kalqutny SH, Ansori ANM, Susilo RJK, Khaleyla F, Winarni D. Hepato-renal protective effects of mangosteen (Garcinia mangostana L.) pericarp extract in streptozotocin-induced diabetic mice. J Physics: Conference Series. 2020;1445:012018.
10. Samudra D, Sumarno, Santoso S, Asmoro AA, Khotimah H, Ansori ANM, *et al.* The Effect of Escherichia coli on Pro-Inflammatory Mediators Level and Kidney and Liver Function of Sepsis in Rattus novergicus. Indian J Forensic Med Toxicol. 2020;14:4302-5.
11. Husen SA, Winarni D, Ansori ANM, Susilo RJK, Hayaza S, Darmanto W. Antioxidant potency of okra (Abelmoschus esculentus I. moench) pods extract to ameliorate kidney structure and function in diabetic mice. Eco Env Conserv. 2020;26(4):1768-74.
12. Fiorentino M, Bolignano D, Tesar V, Pisano A, Biesen WV, D'Arrigo G. Renal Biopsy in 2015 - From Epidemiology to Evidence-Based Indications. Am J Nephrol. 2016;43(1):1-19.
13. Luciano RL, Moeckel GW. Update on the Native Kidney Biopsy: Core Curriculum 2019. Am J Kidney Dis. 2019;73(3):404-15.
14. Kittanamongkolchai. The Association between Proteinuria and High Alcohol Consumption: A Meta-Analysis. 17th International Conference on Dialysis. Advances in Kidney Disease 2015, January 28-30, 2015, New Orleans, La.: Abstracts. Blood Purif. 2015;39:151-73.
15. Shabaka A, Ribera AT, Fernández-Juárez G. Focal Segmental Glomerulosclerosis: State-of-the-Art and Clinical Perspective. Nephron. 2020;144(9):413-27.
16. Tucker BM, Luciano RL. Medication-Associated Glomerular Disease. In: Trachtman H, Herlitz L, Lerma E, Hogan J. (eds) Glomerulonephritis. Springer, Cham. 2019.

GRAPHICAL ABSTRACT



Cite this article: Samudra D, Widodo, Mardiana N, Tjempakasari A, Pranawa, Aditiawardana, et al. Nephrotic Syndrome with Focal Segmental Glomerulosclerosis Histological Feature: A Case Report. Pharmacogn J. 2022;14(4): 459-461.