Lipoprotein Glomerulopathy: a rare case of nephrotic syndrome

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Learning Objectives

- A rare cause of nephrotic syndrome in a specific demographic
- Multidisciplinary approach to management of the disease: cardiology and nephrology

Case

A 25-year-old man from southeast China with hypertension, hyperlipidemia and hypothyroidism was referred to the cardiology clinic for further evaluation of hyperlipidemia. His only complaint was bilateral lower extremity swelling for the past two months, which was improving with diuretics, and foamy urine.

Blood work revealed total cholesterol 574 mg/dL, LDL 468 mg/dL, triglyceride 203 mg/dL, HDL 53 mg/dL, creatinine 1.24 mg/dL, BUN 25 mg/dL albumin 1.8 g/dL, TSH 8.57. urine microalbumin of 2522 (no urine creatinine and thus unable to determine urine protein creatinine ratio).
Renal dopplers showed bilaterally enlarged kidneys.

He underwent work up for nephromegaly in the setting of elevated urine microalbumin levels with severely low serum albumin, concerning for nephrotic syndrome.
Urine protein creatinine ratio was 6.3. A1c 5.1.
Serologic work up was unrevealing with normal C3, elevated C4, negative ANA, ANCA, Anti PLA2R, antiGBM, HIV, HBsAg, Hep C Ab and SPEP with no evidence of monoclonal protein.

Case Continued

Given nephrotic range proteinuria of unclear etiology, the patient underwent renal biopsy that revealed lipoprotein glomerulopathy and moderate interstitial fibrosis.

Genetic testing

Since this disease is associated with an increase in serum apolipoprotein E (apo E), and is usually due to mutation in APOE gene, genetic testing was offered to the patient – he was found to have the E3/E4 genotype.

Management:

Based on case reports that demonstrated therapeutic significance of reducing nephrosis, he was initiated on fibrate therapy. Repeat studies showed drastic improvement in proteinuria with Urine protein creatinine ratio 3.7 and lipid panel with total cholesterol 194 mg/dL, triglycerides 99 mg/dL, HDL 61 mg/dL, and LDL of 115 mg/dL. .

Follow up

At one year follow up, patient reported resolution of symptoms with much improved lipid profile, stable kidney function and urine protein creatinine ratio of 1.9.

Discussion

- Lipoprotein glomerulopathy results from mutations in the APOE gene that cause abnormal lipoproteins to aggregate and deposit in the glomerular capillary walls and the mesangium, with subsequent transformation into lipoprotein thrombi. (1)
- Most patients are asymptomatic, although some present with features of nephrotic syndrome such as our patient.
- Interestingly, it is usually associated with a type III hyperlipoproteinemia (hypertriglyceridemia) however our patient presented with a predominantly LDL elevated lipid panel.
- Intensive therapy using lipid-lowering agents including fibrates have shown to result in clinical remission and histologic resolution with reported reductions in serum cholesterol, triglyceride, apo E levels, urinary protein excretion, and stabilization of the serum creatinine concentration, such as was seen in our patient.
- One-half of patients eventually develop end-stage kidney disease, occurring within approximately 7.5 years from time of diagnosis on average. (2)

References

1. Lipoprotein glomerulopathy may provide a key to unlock the puzzles of renal lipidosis. Saito T, Matsunaga A Kidney Int. 2014 Feb;85(2):243-5.

2. Impact of lipoprotein glomerulopathy on the relationship between lipids and renal diseases.Saito T, Matsunaga A, Oikawa S Am J Kidney Dis. 2006;47(2):199.