Case Report

Membranous glomerulonephritis and tuberculous peritonitis: a rare association

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Abstract

Membranous glomerulonephritis is rarely associated with tuberculosis infection. We report a case of a 24-year-old female with tuberculous peritonitis associated with membranous glomerulonephritis causing subnephrotic range proteinuria. Histological examination confirmed both diagnoses. The patient showed improvement with anti-tubercular drugs over six months of follow-up.

Key words: tuberculous peritonitis; membranous glomerulonephritis; subnephrotic proteinuria

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Introduction

Peritoneal tuberculosis, a form of extrapulmonary infection usually caused by *Mycobacterium tuberculosis*, commonly occurs following reactivation of latent tuberculous foci in the peritoneum that were established from hematogenous spread from a primary lung focus [1]. Although tubercular infections, both pulmonary and extrapulmonary, are very common in developing countries, association of peritoneal tuberculosis with glomerulonephritis is very rare. Here we present a novel case of peritoneal tuberculosis associated with membranous glomerulonephritis.

Clinical records

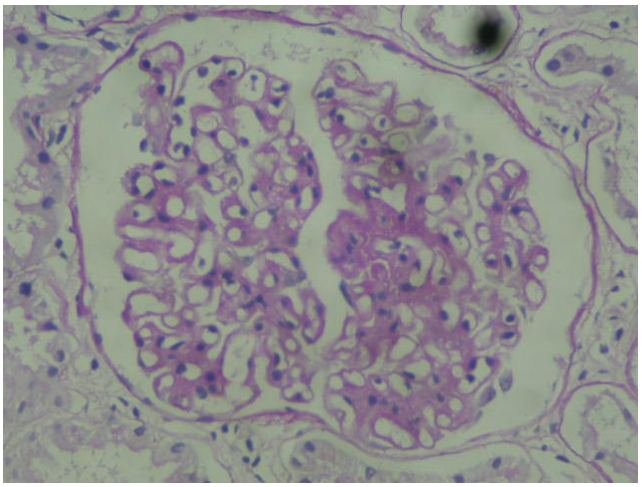
A 24-four-year-old female presented with gradually progressive abdominal swelling associated with low-grade fever for two weeks. This was not associated with pedal or facial swelling. Her urine output was adequate. She had a loss of appetite over this period but no significant loss of weight. She had history of contact with a sputum-positive pulmonary tuberculosis patient during the past one year. She also had a history of menometrorrhagia during the previous six months that had recently subsided following oral contraceptive pill intake.

Examination revealed moderate pallor with grade 3 ascites and normal blood pressure. Routine investigations revealed elevated erythrocyte sedimentation rate (ESR-85 mm in 1st hour) with microcytic hypochromic anemia (Hb- 6.4gm/dl). Serum urea, creatinine values, and lipid profile were normal, and liver function test showed hypoalbuminimia (albumin-1.9 g/dl; globulin-2.6 g/dl). There were granular casts with 3+ proteinuria on several occasions in routine urine examination. At this stage a provisional diagnosis of ascites with glomerulonephritis probably due to some collagen vascular disease was made. Tuberculosis in any form also had to be excluded as the patient had a history of exposure to sputum-positive pulmonary tuberculosis as well as few consistent clinical findings.

On further evaluation, 24-hour urinary protein was 1.8 gm. Chest roentgenogram was normal and no acid fast bacillus (AFB) was detected in three morning sputum samples. Mantoux test showed induration of 10 mm at 72 hours. Ultrasonography of abdomen revealed ascites with multiple septations, as well as normal kidney size with raised echogenicity. Ascitic fluid study showed low SAAG (serum ascitic-fluid albumin gradient) ascites with an elevated cell count (400 cells/dl, 80% lymphocyte), adenosine deaminase level of 47.6 unit/L, absent malignant cells, negative ZN (Ziehl Neelsen) staining, and no growth in BACTEC culture. ELISA for HIV was negative and a thyroid function test was normal.

The serum urea and creatinine values were normal but because of the persistent subnephrotic range, a proteinuria kidney biopsy was performed

Figure 1. membranous glomerulonephritis

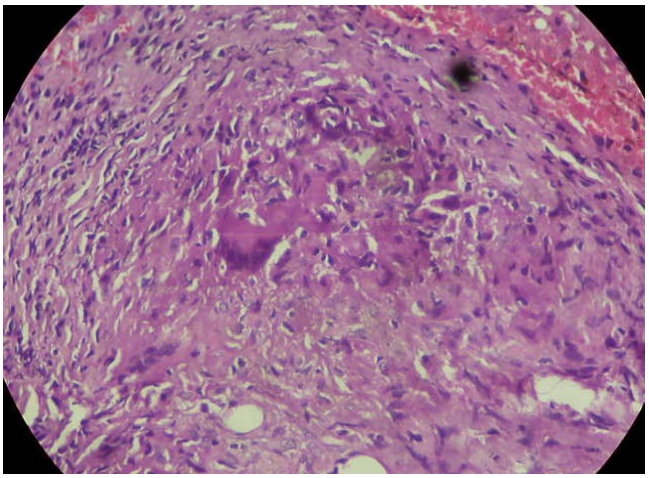


which revealed features of membranous glomerulonephritis (figure 1) with granular, intraepithelial, global, and diffuse deposition of IgG and C3. We followed up this report with a battery of tests for the evaluation of secondary causes of glomerulonephritis, including serology for hepatitis B and C; venereal disease research laboratory test (VDRL); malarial parasite-dual antigen; autoimmune profile including anti-nuclear antibody; rheumatoid factor; and serum angiotensin converting enzyme. All tests were negative. Extensive searches for occult malignancies, including endoscopies and bone marrow examination, were normal; gastric aspirate study was normal with no malignant cells. There was no history of analgesic abuse.

We decided to perform a peritoneal biopsy simultaneously with a kidney biopsy to identify the etiology of low SAAG ascites with septations. Peritoneal biopsy showed features of granulomatous inflammation with central caseation, confirming the diagnosis of tuberculous peritonitis (figure 2). The biopsies were followed by efforts to identify any other primary source of tubercular infection, such as dilatation and curettage of the uterus with endometrial sampling, but the histopathological examination report was normal. Urine ZN stain and BACTEC culture were also negative.

The patient was finally diagnosed as having tuberculous peritonitis with membranous glomerulonephritis without any evidence suggesting involvement of other organ systems. She was put on Isoniazid (300 mg/day), Rifampicin (450 mg/day), Pyrazinamide (1500 mg/day), Ethambutol (1200 mg/day), and Pyridoxin for two months after which only the first two antibiotics were continued for another four months. Serial ultrasonography depicted the disappearance of ascites within two weeks of initiation of antituberculosis medication. Repeat investigations showed gradual normalization of proteinuria (from 1.5g/day to 0.3gm/day) along with the disappearance of the granular cast and gradual improvement in serum albumin (from 2gm/dl to 3.5 gm/dl) over six months' follow-up (table 1).

Figure 2. peritoneal granuloma



Discussion

There exists a well-recognized association in between infections and glomerulonephritis [2]. Membranous glomerulonephritis has been documented to be secondary to viral infections such as hepatitis B and C, autoimmune diseases such as systemic lupus erythematosus, solid organ tumors, hematologic malignancies, non-steroidal anti-inflammatory drugs, and other rare entities including sarcoidosis [3]. The glomerulopathy associated with tuberculosis have been attributed to immune complex deposition [4, 5]. Anti-tubercular therapy has been shown to be effective in improving both tuberculosis as well as the associated glomerulopathy [4].

Among all the patients with membranous glomerulonephritis, 60-70% present with nephrotic syndrome and the remaining 30-40% have subnephrotic proteinuria (< 3.5gm/24hours). The majority of the patients are normotensive and have normal renal function tests at presentation [3]. Our patient presented with subnephrotic proteinuria with normal serum urea and creatinine values as well as fully developed stage 2 lesions of membranous glomerulonephritis. The role of immunosuppressive therapy in these situations is not fully established.

Table 1. Improvement of parameters following institution of anti-tubercular therapy

Parameters	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
24 hr urinary protein (gm/d)	1.5	0.8	0.5	0.3	0.3	0.3
Granular casts in urine	+	-	-	-	-	-
Serum albumin (gm/dl)	2	1.8	2.2	2.5	3.1	3.5

The concerned patient also had active tuberculosis; hence immunosuppressive therapy was not initiated. In this patient gradual improvement of ascites and proteinuria following anti-tubercular therapy, in absence of any other antiproteinuric medication, supports the causal association between tuberculosis and membranous glomerulonephritis.

Corticosteroid and other immunosupressives used in glomerulopathy including membranous variety often predispose the patient to the development of tuberculosis [6,7]. But evidence of tuberculous infection causing membranous glomerulopathy are very few [5,8,9]. The association of membranous glomerulonephritis with tuberculosis infection in the form of peritonitis is unique and has not been documented in the literature so far to date. The simultaneous existence of both membranous glomerulonephritis and tuberculous peritonitis in a patient without any preexisting conditions which might independently predispose the patient to either of the two entities, and the simultaneous improvement of both the entities solely with antitubercular treatment, indicates that the association may not be a mere finding but that they most probably are causally related. Therefore, this report would serve to enrich the experience of clinicians dealing with infectious diseases in the developing world who may encounter numerous cases of tubercular infection presenting with diverse clinical manifestations.

References

1. Mehta JB, Dutt A, Harvill L, Mathews KM (1991) Epidemiology of extrapulmonary tuberculosis. A comparative analysis with pre-AIDS era. Chest 99: 1134.
2. Pande A, Ghosh B, Pain S, Karmakar RN, Ghosh A, Saha S (2010) An unusual presentation of staphylococcal tricuspid valve infective endocarditis. N Z Med J 123: 73-76.
3. Lerma EV, Berns JS and Nissenson AR (2009) Current Diagnosis & Treatment in Nephrology & Hypertension, LANGE CURRENT series, 1st edition. New York: McGraw-Hill Medical 230-232p.
4. Shribman JH, Eastwood JB, Uff J (1983) Immune complex nephritis complicating miliary tuberculosis. Br Med J 287: 1593-1594.
5. Mercadal L, Martinez F, Barrou B, Delcourt A, Deray G, Jacobs C, Beaufils H, Jouanneau C (2000) Retroperitoneal fibrosis and membranous nephropathy. Clin Nephrol 53: 71-74.
6. Chan TM, Li FK, Hao WK, Chan KW, Lui SL, Tang S, Lai KN (1999) Treatment of membranous lupus nephritis with nephritic syndrome by sequential immunosuppression. Lupus 8: 545-531.
7. Han BG, Choi SO, Lee SJ, Kim YH, Hong WP, Lee JH (2001) Choroidal tuberculoma with membranous glomerulonephritis. Yonsei Med J 42: 446-450.
8. Lee JH, Song JH, Park YR, Kim JY, Yang CW, Kim YS, Bang BK (2008) Membranous glomerulonephritis associated with pancreatic tuberculosis. Korean J Med 74: 546-550.
9. Rodriguez-Garcia JL, Fraile G, Mampaso F, Teruel JL (1990) Pulmonary Tuberculosis Associated with Membranous Nephropathy. Nephron 55: 218-219.

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