An Unusual Manifestation of Q Fever: Peritonitis

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Introduction

Q fever is caused by Coxiella burnetii and is a worldwide zoonotic disease. The primary reservoirs of this intracellular, pleomorphic, Gram-negative microorganism are cattle, sheep and goats. The infected animals transmit the pathogen via bacterial shedding in their body secretions. Humans become infected via the inhalation of infectious aerosols either directly from the secretions of infected animals or from dust contaminated with these fluids [1,2].

Q fever can be difficult to diagnose due to its nonspecific clinical presentations. In this study, we report an unusual case of Q fever that presented as peritonitis in a patient undergoing dialysis.

Summary

Q fever has rarely been reported and can be difficult to diagnose, especially in immunocompromised patients. In the present report, we describe an unusual case of Q fever that presented as peritonitis and was treated with long-term combination therapy with doxycycline, ciprofloxacin and rifampicin for five weeks in a patient who had been on peritoneal dialysis for six years due to hypertensive nephropathy.

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Case report

A 41-year-old man living in a village with sheep and goats had been on peritoneal dialysis for six years due to hypertensive nephropathy and experienced six attacks peritonitis within this period. Previous peritoneal fluid cultures yielded E. coli and coagulase-negative staphylococci. He was admitted to hospital with a 10-day history of fever, nausea, vomiting and weakness. Only fever (39°C) and abdominal tenderness were noted on physical examination. Laboratory tests revealed an elevated leukocyte count (17.3 × 10⁹/mm³), sedimentation rate (75 mm/h) and C-reactive protein level (CRP, 9.5 mg/L for normal values <3 mg/L) and anemia (with a hemoglobin level of 10.1 g/dL). Blood biochemistry tests revealed liver cholestasis (alkaline phosphatase (ALP) 161 U/L, normal values <129 U/L and gamma-glutamyl transpeptidase (GGT) 65 U/L, normal values <60 U/L) and normal transaminase and bilirubin levels. Renal function tests revealed hyperazotemia (BUN 30 mg/dL, normal values <20 mg/dL and creatinine 13.2 mg/dL, normal values <1.2 mg/dL).

A peritoneal fluid examination revealed 170 cells/mm³, and the patient was given tazobactam-piperacillin and vancomycin empirically with the preliminary diagnosis of peritonitis. Because the patient remained febrile, the antibiotic treatment was switched to imipenem and vancomycin. The blood and peritoneal fluid cultures were sterile. Due to the persistence of fever, the peritoneal catheter was removed, but no microorganisms were grown on culture. A computed tomography (CT) scan of the thorax, abdomen and pelvis revealed bilateral minimal pleural effusion, diffuse thickening of the rectum, sigmoid colon and peritoneum and massive ascites and peritonitis (Fig. 1). Gram and Ziehl-Neelsen stainings and cultures, polymerase chain reaction (PCR), cytology of the ascites fluid and a QuantiFERON test for tuberculosis were negative. A bone marrow biopsy was normal, and a peritoneum biopsy revealed chronic inflammation.

Discussion

Q fever was first described in 1937 by Derrick EQ. Totals of 1168 cases between 1948 and 1977 and 436 cases between 1978 and 1999 were reported to the Centers for Disease Control and Prevention (CDC). Since 1999, Q fever has become a notifiable disease in the United States due to its potential as a biological warfare agent [1]. Since that time, reports of Q fever have increased, and from 2007 to 2010, the largest Q fever outbreak, which involved 4000 human cases, was reported in the Netherlands [3].

In Turkey, the Coxiella burnetii IgG seropositivity rates are 1.8—13.5% in healthy people and 42.4% in high-risk groups [4—6]. The factors that suggested acute Q fever in our patient were the following: a history of animal exposure, fever, headache,
An unusual manifestation of Q fever

An unusual manifestation of Q fever in 50% of cases[2]. Antiphospholipid antibodies were detected from the CDC, thrombocytopenia was reported in 25% and antiphospholipid antibodies. In a recent report from the CDC, thrombocytopenia was reported in 25% and antiphospholipid antibodies were detected in 50% of cases [2].

The spectrum of Q fever is pleomorphic, the major clinical presentations include acute febrile illness, pneumonia and hepatitis, and the disease has rarely been reported in immunocompromised hosts [1,8—10]. In a review from France, 20% of 84 chronic Q fever patients were immunosuppressed, including patients with cancer, renal transplantation, chronic myeloid leukemia, corticosteroid therapy, acquired immunodeficiency syndrome, postpartum status, chronic alcoholism and renal dialysis [11]. Our patient had been on peritoneal dialysis for six years. The absolute numbers of T cells in patients who have received dialysis for more than one year are reduced [12]. Furthermore, long-term exposure of peritoneal cells to dialysis solutions might also alter the normal immunological reactions against bacteria (e.g., decreased opsonic activities against bacteria) [13].

Because the immune control of C. burnetii is T-cell dependent, patients on renal dialysis are prone to intracellular bacteria such as C. burnetii [14].

Pericarditis, myocarditis, thyroiditis, meningencephalitis, hemolytic anemia, nephritis, osteomyelitis and hemophagocytic syndrome are rare manifestations of Q fever [7,15,16]. In addition to the knowledge provided by our case, Chang et al. described peritonitis as a manifestation of Q fever in a patient with diabetes mellitus in Taiwan [17]. These authors observed peritoneal involvement on a gallium scan and diffuse abdominal uptake on an inflammatory scan.

We were unable to isolate the bacteria, and the peritoneal fluid PCR was negative because it was performed long after the onset of the symptoms. The diagnosis of the patient was confirmed by an indirect immunofluorescence (IF) test. In suspected cases, the diagnosis of Q fever should be confirmed by serum titers (IgG and/or IgM) obtained via IF because these tests are very sensitive and specific [18]. The diagnosis of Q fever was based on the positivity of the Phase 2 IgG (1/1024). Concordant with the cases reported by Yesilyurt et al., the Phase 2 IgM was negative [19]. We believe that this negativity resulted from the suppression of the immune system due to chronic renal failure. Because of the poor responsiveness of the patient to doxycycline and ciprofloxacin therapy, rifampicin was added to the therapy. He recovered after 5 weeks of triple antibiotic therapy. The inflammatory markers in the serum, cell counts in the peritoneal fluid and ascites and the thickening of the peritoneum were resolved after this therapy. Long-duration combination therapy should be considered for certain patients who exhibit poor responsiveness to monotherapy, particularly immunocompromised patients.

We reported an unusual case of Q fever that presented as peritonitis. Clinicians should be aware of such rare manifestations, particularly immunocompromised patients, because the infrequent consideration of Q fever in such patients could delay therapy.

Conflict of interest

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References


