CASE REPORT

Spontaneous bacterial peritonitis: an unusual manifestation of brucellosis in a previous healthy male patient

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Accepted 1 April 2015

SUMMARY

Brucellosis is a common zoonotic disease with worldwide distribution and protean clinical manifestations. Therefore, its prompt and timely diagnosis is still challenging. Among several complications of brucellosis, spontaneous bacterial peritonitis (SBP) in previously healthy participants is rarely recognised, although this condition can be fatal if misdiagnosed and untreated. We present a case of a 69-year-old previously healthy stockbreeder who suffered from back pain along with abdominal pain and distension because of ascites of 6–8 weeks duration. Cultures of ascitic fluid and peripheral blood specimens revealed *Brucella* spp as the causative agent of ascites and spondylodiscitis, which was then confirmed by MRI findings. After appropriate treatment for 4.5 months (streptomycin 1 g/day for 3 weeks intramuscularly, doxycycline 100 mg twice a day orally and rifampicin 900 mg/day orally), the patient fully recovered. Conclusively, in the appropriate epidemiological and clinical setting, the consideration of brucellosis in the differential diagnosis of SBP could be rational as well as life-saving.

further the importance of including brucellosis in the differential diagnosis in areas, such as the Mediterranean basin, of endemic disease, even if clinical features are not entirely compatible.

CASE PRESENTATION

A 69-year-old Caucasian man, a stockbreeder, was admitted to our department because of low back pain and gradual distension of the abdomen of 6–8 weeks duration accompanied by abdominal pain. On admission, he had no fever but was confused; physical examination revealed a palpable soft liver 4–5 cm below the right costal margin. The presence of massive ascites was also prominent. Blood pressure was 125/70 mm Hg, heart rate was 98 bpm and respiratory rate was 16/min. The patient's family members denied consumption of unpasteurised animal-milk products, intravenous or nasal illicit drug use, or use of alcohol over 30 g/day. During the past 3–4 weeks, however, they referred to the patient having used of paracetamol and non-steroidal anti-inflammatory drugs every other day for the relief of back pain and, therefore, the absence of fever was questionable.

BACKGROUND

Brucellosis is a zoonosis with worldwide distribution and is traditionally described as a disease of protean manifestations.¹ The disease causes much clinical morbidity in the developing world but in the era of international tourism, brucellosis has become a common imported disease in the developed world as well. Human brucellosis seems to have a characteristic multisystem involvement in which any organ or system can be affected.¹ In this context, osteoarticular disease is the most common complication of brucellosis, including three distinct forms, namely, peripheral arthritis, sacroiliitis and spondylitis.¹ Other important manifestations include the development of reproductive system disorders (eg, epididymo-orchitis in men), disorders of the central nervous system, as well as cardiovascular and respiratory disorders.^{1,2}

However, brucellosis is an extremely rare cause of spontaneous bacterial peritonitis (SBP), particularly in previously healthy participants. Indeed, so far, most of the reported cases published of *Brucella* peritonitis have been on patients with pre-existing chronic liver or kidney diseases.^{3–14} Therefore, we describe a case of a previously healthy man who developed SBP and spondylodiscitis due to brucellosis, in order to underscore

INVESTIGATIONS

Erythrocyte sedimentation rate (ESR, 80 mm/1 h), C reactive protein (CRP, 7.7 mg/dL), international normalised ratio (INR, 1.5), total bilirubin (1.27 mg/dL), aspartate aminotransferase (AST, 63 IU/L), alanine aminotransferase (ALT, 54 IU/L) and γ -glutamyl transpeptidase (γ -GT, 62 IU/L) were elevated, whereas platelets ($80 \times 10^3/\mu\text{L}$) and serum sodium (120 meq/L) were low. The remaining haematological and biochemical parameters were within normal limits. Serological tests for viral hepatitis showed a profile of past infection for hepatitis A and B viruses (HBsAg negative, anti-HBs positive, anti-HBc positive, anti-HBe positive, anti-HAV IgG positive and anti-HCV negative).

Abdominal ultrasonography confirmed the presence of hepatomegaly and gross ascites. Investigation of the ascitic fluid after paracentesis showed: leucocytes $1200/\mu\text{L}$ (30% neutrophils, absolute number: $360/\mu\text{L}$) and serum-ascites albumin gradient of 1.99 g/dL, which was compatible with ascites due to portal hypertension.¹⁵ No organism was detected on direct Gram staining of peritoneal fluid. Subsequently, a first diagnosis of SBP was performed and cefotaxime 2 g twice daily intravenously along with intravenous administration of albumin (1.5 g/kg at diagnosis and 1 g/kg on day 3), according to the

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To cite: Makaritsis KP, Liaskos C, Papadamou G, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2015-209387

EASL guidelines,¹⁵ was started immediately after several sets of ascitic fluid and blood cultures had been taken.

In addition, because of the symptom of lower back pain, MRI was performed, indicating an increased signal of the L4-L5 bodies and intervertebral disc as well as bone marrow oedema producing canal stenosis. These findings in association with the increased laboratory markers of inflammation confirmed the diagnosis of spondylodiscitis and intravenous vancomycin 2 g/day was added.

However, 3 days later, serum *Brucella* agglutination testing (Wright-Coombs reaction) showed high positive titres (1/2560), whereas on the fifth day of admission, peripheral blood and peritoneal fluid cultures yielded *Brucella* spp.

DIFFERENTIAL DIAGNOSIS

According to the aforementioned epidemiological (stock-breeder), clinical (bacterial peritonitis and spondylodiscitis) and laboratory findings (high ESR and CRP values, high Wright serological test, MRI results, and identification of *Brucella* spp in ascitic and blood cultures), an efficient diagnosis of simultaneous SBP and spondylodiscitis due to brucellosis was established.

TREATMENT

As the patient's condition had not improved, and taking into account the firm diagnosis of SBP and spondylodiscitis due to brucellosis, treatment was immediately changed to streptomycin 1 g/day for 3 weeks intramuscularly, doxycycline 100 mg twice daily orally and rifampicin 900 mg/day orally. After 10 days of specific treatment against *Brucella*, the patient significantly improved and the haematological and biochemical laboratory markers normalised.

OUTCOME AND FOLLOW-UP

After 1 month of therapy, the ascites had almost disappeared, and the patient could walk without back pain. After 4.5 months of specific treatment the patient attained good health and now, almost 2 years post-treatment, no other episode of ascites or back pain has occurred. In addition, new MRI investigation on the sixth month from his admission showed complete resolution of spondylodiscitis.

DISCUSSION

Brucellosis usually manifests as a febrile illness with malaise and weight loss. The typical clinical features of the disease include spleen enlargement, joint involvement, orchitis or epididymo-orchitis and lymphadenopathy.^{1 16} However, atypical presentations from other organs are not completely infrequent.^{1 17 18} Contrary to past beliefs, recent studies have shown that liver involvement is common in brucellosis cases.^{19–21} However, the development of ascites in brucellosis is quite rare and in most cases is presented in patients with pre-existing liver cirrhosis.^{3–7 9–14} Therefore, in most instances, the serum-ascites albumin gradient is above 1.1 g/dL, which is indicative of the presence of portal hypertension. Of note, in our case, although the serum-ascites albumin gradient was suggestive of portal hypertension, this was not confirmed by several and extensive studies, and no history or signs of current or pre-existing liver disease were found.

Although the pathogenetic mechanisms leading to ascites and SBP in brucellosis are unclear, the positive ascitic-fluid cultures, as in our case, may suppose a direct peritoneal infection from *Brucella*. The latter explanation is quite attractive for patients with chronic liver disease^{4–6 9 10} or other conditions such as

continuous ambulatory peritoneal dialysis.⁸ Indeed, patients with decompensated liver cirrhosis have a high risk of bacterial infection, because, actually, they are in an immunosuppressive state as attested by the defective cellular and humoral responses, depressed serum complement levels and impaired antibody production. In addition, the 'clearance' of enteric microorganisms is impaired because of the portosystemic shunts. However, in cases without pre-existing liver disease, the development of brucellosis-related SBP remains obscure, though haematogenous spreading seems the most rational explanation.

Concerning management, there is no consensus and no guidelines exist for the duration of specific treatment for *Brucella* peritonitis.²² However, we propose that these patients be managed as cases of organ-localisation forms of brucellosis.¹ Accordingly, we recommend a triple medication schedule with streptomycin, doxycycline and rifampicin, for long-term treatment of at least 3–4 months, as in our index patient.^{1 16 22}

In conclusion, brucellosis is a multisystem disease that may affect many organs. Although our report describes a relatively rare case of simultaneous *Brucella*-related SBP and spondylodiscitis, we believe that in previously healthy participants living or coming from endemic regions, the potential presence of brucellosis may be considered in the differential diagnosis of newly recognised ascites, as this approach can significantly affect the outcome.

Learning points

- ▶ Brucellosis is a zoonotic disease with worldwide distribution and protean clinical manifestations, affecting mainly the joints and reproductive system.
- ▶ However, human brucellosis seems to have a characteristic multisystem involvement in which any organ or system can be potentially affected.
- ▶ The presence of ascites in patients with brucellosis is quite rare and, in most cases, is developed in those with pre-existing liver cirrhosis.
- ▶ However, the potential presence of brucellosis may be considered in the differential diagnosis of newly recognised ascites even in previously healthy participants living or coming from endemic regions, as this approach can significantly affect the outcome of these patients.

Contributors KPM and GND had the original idea for the paper and wrote the study protocol. CL and GP collected and analysed the appropriate data and wrote the first version of the manuscript. KPM, CL and GP treated and followed up the patient. GND revised the final version of the case report in depth and along with KPM wrote the final version while also being responsible for the long-term follow-up and treatment management of the patient.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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