CASE REPORT

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Autoimmune Haemolytic Anaemia as an Unusual Presentation of Brucellosis in a Middle-Aged Woman

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Abstract

Brucellosis, a widespread zoonotic infection in developing countries, frequently presents with nonspecific symptoms, complicating its diagnosis. This report highlights a rare case of brucellosis in a 42-year-old woman with a prosthetic mitral valve, who presented with Coombs-positive haemolytic anaemia, though the peripheral blood film showed no schistocytes. Her symptoms included low-grade fever, shortness of breath, dry cough, and weakness. Laboratory tests confirmed hemolysis, and blood cultures identified Brucella melitensis as the causative pathogen. The patient was successfully treated with a prolonged course of doxycycline and rifampicin. This case emphasizes the importance of considering brucellosis in the differential diagnosis of haemolytic anaemia, particularly in endemic regions.

Key words: Brucellosis, haemolytic anaemia, Coomb's test, prosthetic mitral valve, zoonosis.

Introduction

Brucellosis, also known as Malta fever or Mediterranean fever, is a common zoonotic disease in many developing countries. It is caused by gram-negative coccobacillus, of which, *B. melitensis* and *B. abortus* affect humans most commonly. The infection is transmitted to humans via direct contact with infected animals or consumption of unpasteurised dairy products[1,2,3]. The constitutional symptoms occur in both acute and chronic infections. however, they are more frequent in acute infection[1,4]. Fever occurs during the disease in almost all patients[1]. Though primarily known for its systemic and musculoskeletal manifestations, it can present atypically with haematologic abnormalities, including pancytopenia, thrombocytopenia, and rarely, haemolytic anaemia[5,6,7]. The rarity of such presentations often delays diagnosis[8,9].

We report a rare presentation of brucellosis in a middle-aged woman with prosthetic mitral valve, who presented with haemolytic anaemia and fever – initially without any specific localizing signs – highlighting the diagnostic challenge and the need for high clinical suspicion in endemic regions[10].

Case Presentation

A 42-year-old female presented to the hospital with symptoms of low-grade fever for 40 days, shortness of breath on exertion for 30 days, dry cough for 30 days, and generalised weakness for 20 days. The patient had undergone mitral valve replacement 4 years back and was on long-term anticoagulation therapy with acenocoumarol, along with aspirin and torsemide. Her occupational background as a farmer exposed her regularly to cattle and unpasteurised milk. She had no history of smoking, alcohol use or recent travel.

On physical examination, she was febrile with temperature of 101.2° F, tachycardic (pulse rate 102 bpm), and normotensive (BP 110/70 mmHg), with oxygen saturation of 96% on room air. Pallor was present, but there were no signs of icterus, lymphadenopathy or oedema. Cardiovascular examination revealed a metallic S1 click consistent with her prosthetic valve, without any murmurs. Respiratory and central nervous system examination was unremarkable, while abdominal examination revealed mild hepatomegaly. Initial laboratory workup showed microcytic hypochromic anaemia, and peripheral smear confirmed anisocytosis and polychromasia with no parasitic forms and adequate platelet count. A positive direct Coomb's test, elevated ESR- 85mm\h, and signs of ongoing hemolysis pointed towards immune-mediated haemolytic anaemia. Chest X-ray findings were normal, and 2D echocardiography revealed a well-functioning prosthetic mitral valve with no vegetations or features suggestive of infective endocarditis. Blood culture grew *Brucella melitensis* species, confirming the infectious aetiology.

With a final diagnosis of brucellosis-associated Coomb's-positive haemolytic anaemia, the patient was initiated on oral doxycycline 100 mg twice daily and rifampicin 600 mg

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once daily for a total of 6 weeks. Supportive treatment included transfusion of two units of packed red blood cells, folic acid, and oral iron supplementation. Anticoagulation with acenocoumarol was continued with regular INR monitoring and dose adjustments. The patient showed a favourable response, with defervescence of fever by the fourth day of treatment and progressive improvement in haemoglobin levels following transfusion. Repeat blood cultures taken after 2 weeks of initiation of antibiotics were sterile. She was discharged on the seventh day with instructions for outpatient follow-up focusing on anticoagulation management and haematologic monitoring. At her four-week follow-up, she remained afebrile, her energy levels had returned to normal, and her haemoglobin had improved to 11.8 g/dL.

Discussion

Brucellosis is a globally prevalent zoonotic disease caused by Brucella species, *primarily B. melitensis*, which infects humans through direct contact with infected animals or the ingestion of unpasteurised dairy products[1,2]. It remains endemic in India, especially among individuals involved in livestock handling or rural occupations[3,4]. The disease often presents with non-specific symptoms such as fever, malaise, and fatigue, making the diagnosis challenging[8]. Although brucellosis is known to cause haematologic abnormalities like anaemia, leukopenia, and thrombocytopenia. Autoimmune haemolytic anaemia (AIHA) is a particularly rare manifestation[5,11].

Anaemia in brucellosis is commonly mild and normocytic, associated with chronic disease or bone marrow suppression[8]. However, AIHA, confirmed by a positive direct Coomb's test and features of haemolysis, is exceedingly rare. It is estimated to occur in less than 1% of cases, with fewer than 20 well-documented reports worldwide[5,10,11]. Studies such as Kaya *et al* found anaemia in 13% of patients, but no cases of AIHA in a large cohort[5]. The pathogenesis of AIHA in brucellosis is thought to involve molecular mimicry or immune dysregulation, where Brucella antigens may stimulate autoantibody production against erythrocytes.

Review of literature

Isolated case reports by Meena *et al* and Sari *et al* have described instances of acute brucellosis presenting with Coomb's-positive AIHA, highlighting the diagnostic challenge posed by such atypical presentations[7,11].

Ibrahim *et al* documented a similar case in a Saudi woman, thereby contributing to the limited global literature on this uncommon clinical presentation[10].

Our patient, with a history of mitral valve replacement and occupational exposure to cattle and unpasteurised milk, presented with features of haemolytic anaemia and a positive Coomb's test, eventually confirmed to have Brucella bacteraemia. The presence of a prosthetic valve initially raised concerns for infective endocarditis – a known, albeit rare, complication of brucellosis[6]. However, echocardiography showed a well-functioning prosthetic valve with no vegetations, helping to rule-out endocarditis. Such patients; however, require ongoing monitoring due to the elevated risk of developing prosthetic valve infections[7].

The diagnosis in this case was established via blood culture, which remains the gold standard for detecting *Brucella spp*. Despite requiring prolonged incubation, culture confirms active infection and supports targeted antimicrobial therapy[1]. Serological tests and PCR, though helpful, are often unavailable in many settings. The cornerstone of treatment for brucellosis includes combination antibiotic therapy. The World Health Organisation recommends doxycycline and rifampicin for at least six weeks to prevent relapse[2] . Our patient responded well to this regimen, with resolution of fever by day four and normalisation of haemoglobin levels following transfusion support.

In most reported cases of brucellosis-induced AIHA, supportive treatment with folic acid, iron, and blood transfusions suffice and mainstay treatment of brucellosis include doxycycline, rifampicin, streptomycin and ceftriaxone. Corticosteroids are reserved for severe or refractory hemolysis, and immunosuppressive agents like rituximab or IVIg are rarely required[11]. Given our patient's prosthetic valve, anticoagulation was continued with careful INR monitoring, which was crucial to avoid thrombotic complications.

This case reinforces the importance of considering brucellosis in the differential diagnosis of AIHA in endemic regions. It also highlights the need for early microbiological confirmation, especially in atypical presentations. In patients with prosthetic valves, ruling out endocarditis is critical, and a multidisciplinary approach ensures safe and effective care.

Conclusion

This case highlights a rare presentation of brucellosis as Coomb's-positive autoimmune haemolytic anaemia (AIHA) in a patient with a prosthetic mitral valve, emphasizing the diagnostic challenges associated with its protean manifestations. In endemic regions, brucellosis should be considered in the differential diagnosis of unexplained haemolytic anaemia, particularly in individuals with occupational exposure to livestock or unpasteurised dairy products. Early recognition through appropriate diagnostic

modalities, including blood cultures and Coomb's testing, is essential for prompt treatment and favorable outcomes. The case also underscores the importance of thorough clinical evaluation in patients with prosthetic valves to rule-out infective endocarditis, which remains a significant potential complication. Multidisciplinary management and close follow-up are vital to ensure both infection resolution and stable anticoagulation in patients with cardiac prostheses.

In conclusion, this case contributes to the limited but growing literature on brucellosis-induced AIHA and reinforces the importance of considering infectious etiologies in atypical haematologic presentations, especially in patients with identifiable risk factors such as rural occupation, animal contact and use of unpasteurised milk.

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