Article published online: 2020-02-19

Case Report

Access this article online
Quick Response Code:

Website: www.jlponline.org
DOI: 10.4103/JLP.JLP_12_17

Triad of infective endocarditis, splenic abscess, and septicemia caused by *Brucella melitensis*

Shashank Purwar, Sharada C. Metgud, Shankar G. Karadesai, Mahantesh B. Nagamoti, Arathi Darshan[1], Shreshtha Tiwari[2]

Abstract:

A 40-year-old farmer from the district of North Karnataka who had received treatment for high fever of 8 days duration was admitted with fever, dyspnea, and poor general condition. Ultrasonography and echocardiogram revealed multiple splenic abscesses, vegetation on atrioventricular valve, aortic regurgitation (Grade I–II), and mitral valve regurgitation (Grade II–III), respectively. *Brucella melitensis* was detected in blood culture, and high titers of IgM and IgG anti-*Brucella* antibodies were observed in *Brucella* specific serological tests. The patient developed fulminant septicemia and succumbed due to multi-organ failure.

Key words:

Brucella, endocarditis, septicemia, splenic abscess

Introduction

Brucellosis is caused by members of bacterial genus *Brucella* which is a facultative intracellular Gram-negative pathogen. Brucellosis is a common but neglected disease in India[1] and can be treated with antibiotic but is often misdiagnosed because of the difficult diagnosis and lack of experience with laboratory testing. Although North Karnataka is endemic for brucellosis, case reports are predominantly from Belgaum and Bijapur district.[2,3] Seroprevalence of Brucellosis from these areas has been reported by various authors ranging from 5.1% to 19.69%.[4-6] Hence, in any case presenting with pyrexia of unknown origin (PUO), high degree of clinical suspicion of brucellosis is to be considered. We report here a rare case of brucellosis with infective endocarditis (IE), splenic abscesses and septicemia.

Case Report

A 40-year-old farmer from the district of North Karnataka was admitted to KLE Dr. Prabhakar Kore Hospital and Medical Research center, Belgaum Karnataka with high fever (102°F-104°F), chills and rigors with associated toxic features. Eight days earlier, the patient was admitted at another health-care facility and received ofloxacin and ceftriaxone for similar complaints. The patient took discharge against medical advice after the fever had disappeared after 48 h of antibiotic treatment only to reappear after 6 days necessitating the admission to our hospital in serious condition.

The patient was engaged in cattle rearing since a long time had undergone balloon mitral valvoplasty 4 months earlier for IE of unknown etiology. There was no other history of significant illness. Clinical examination detected tenderness in the

Departments of Microbiology and [1]Medicine, Jawaharlal Nehru Medical College and KLE Charitable Hospital and Medical Research Center, Belgaum, Karnataka, [2]Department of Microbiology, All India Institute of Medical Sciences, Bhopal, Madhya Pradesh, India

Address for correspondence:
Dr. Shashank Purwar, Department of Microbiology, All India Institute of Medical Sciences, Bhopal, Madhya Pradesh, India.
E-mail: shashank.microbiology@aiimsbhopal.edu.in

Submission: 16-01-2017
Accepted: 15-05-2017

How to cite this article: Purwar S, Metgud SC, Karadesai SG, Nagamoti MB, Darshan A, Tiwari S. Triad of infective endocarditis, splenic abscess, and septicemia caused by *Brucella melitensis*. J Lab Physicians 2017;9:340-2.

left hypochondrium and holosystolic and a soft diastolic murmur at the apex on auscultation. The patient was empirically put on cefoperazone plus sulbactam, aztreonam, and tetracycline antibiotics. Ultrasonography of abdomen revealed multiple splenic abscesses. Vegetations on atrioventricular valve, aortic regurgitation (Grade I–II) and mitral valve regurgitation (Grade II–III) were detected on echocardiogram.

Laboratory findings

Blood samples were submitted for culture, serology, and biochemical investigations. Remarkable findings included erythrocyte sedimentation rate 118, fasting blood sugar 310 mg/dl, urea 150, creatinine 2.5, total bilirubin 5.2, aspartate aminotransferase: 265, alanine aminotransferase: 98, alkaline phosphatase: 195, sodium: 134, potassium: 4.6, bicarbonates: 11, chloride^{-}: 100. Chest X-ray was normal.

The serum sample of the patient was negative for Widal, HIV, and hepatitis B surface antigen but provided strong agglutination reaction in *Brucella* slide agglutination test. The serum was then subjected to *Brucella* standard tube agglutination test (STAT) along with. The serum was also tested to differentiate IgM and IgG titers using 2-mercapthoethanol (2-ME) parallel to phenol saline used in STAT. End titers were 2560 IU/ml in STAT 1:640 dilution of serum in 2-ME using 50% agglutination as cutoff. The blood was inoculated to brain-heart infusion medium poured in biphasic manner (Castaneda method) and incubated at 37°C.

The positive findings of high anti-*Brucella* antibodies were conveyed to the attending physician who promptly changed the antibiotics to injection rifampicin, streptomycin, and tetracycline. However, the patient deteriorated and developed hypotension, seizures and dyspnea, requiring ventilator support. The patient died within 36 h of admission and cited causes of death included septicemia, multi-organ failure, ARDS (acute respiratory distress syndrome), disseminated intravascular coagulation with IE due to *Brucella*.

The blood culture yielded growth after 9 days. The growth was of a single type and identified as *Brucella* on the basis of Gram stain morphology, positive oxidase test, and rapid hydrolysis of urea as demonstrated in Christensen's urease medium. The isolate was identified as *Brucella melitensis* based on growth on dye-containing media, 1:50,000 Thionin and Basic fuchsin.

Discussion

The patient had been exposed to definitive risk factors for *Brucella* infection because of being engaged in cattle rearing. He belonged to an area endemic for brucellosis but the risk factors probably got overlooked, and brucellosis was not suspected anytime. Diagnosis of brucellosis is often missed and it has been well-acknowledged fact that actual incidence of human brucellosis may be 25 times than reported cases[7] mostly because of misdiagnosis which is usually ascribed to protean manifestations of brucellosis and also to repeated phases of remissions/exacerbations.

Farmers living in close quarters of cattle sheds and using cattle for tilling fields are at higher risk for acquiring brucellosis because *Brucella* bacterium survives for a considerable time in dung, dust, excreta, aborted fetus, and products of conception and can establish infection through inhalation. In areas endemic for brucellosis, even in the absence of history of consumption of unboiled milk/milk products aforementioned factors shall be considered in patients who may be exposed to risk factors for brucellosis. Focal lesions other than osteoarticular can be seen in up to 30% of the untreated cases of brucellosis and diagnostic delay >30 days, has been found to be a significant independent variable associated with the presence of focal forms in brucellosis, with osteoarticular forms being more common and those affecting the heart and the central nervous system being more severe.[8]

STAT provides an estimation of total antibodies whereas 2-ME test which was set up in parallel to *Brucella* STAT is looked on as an indicator of the amount of anti-*Brucella* IgG agglutinins present in the serum because 2-ME dissolve the disulfide bonds that link IgM molecules to release the subunits, thus inactivating the IgM antibodies. During the remissions phase of illness, the predominant titers are IgG, whereas at the time of overt symptoms rise in IgM titers or combined rise of IgG and IgM titers is observed. In this case, end titers in STAT were observed in dilution double than that seen in 2-ME, suggesting a significant level of IgG antibodies in addition to high level of IgM antibodies implying acute exacerbation of the long disease process.

Endocarditis and cardiac failure cause mortality in 3%–5% of cases of brucellosis and *Brucella* may infect normal as well previously damaged/congenitally malformed heart valves.[9] *Brucella* endocarditis is a destructive process predominantly involving the aorticvalve and perivascular tissues. Even a single episode of transient bacteremia is sufficient to seed the damaged or excoriated endothelium, and consequent vegetation formations. Splenic abscess is a very rare complication of brucellosis; 0.2%–0.7% incidence has been reported in a large autopsy series[10,11] and not much is known about the exact pathophysiology of the splenic abscess, but hematogenous spread is only plausible route.

Blood culture yields in *Brucella* infection vary from 15% to 70% and dependent on stage of infection.[12] Diagnosis of hepatosplenic brucellosis is considered difficult and mostly based on radiological findings and serology, but *Brucella* is rarely recovered in these cases.[13] In this case, the presence of vegetations on heart valves, multiple abscesses in spleen suggest multi-organ involvement and isolation of only one organism viz. *Brucella* from blood culture coupled with high level of specific anti-*Brucella* agglutinins prove causative role of *Brucella* in genesis of septicemia and the consequent demise of this patient.

Conclusion

Brucella IE and splenic abscess are rare complications of brucellosis and reports of septicemia are too rare. To the best of our knowledge, triad of IE, splenic abscess and septicemia has never been reported and physician shall consider brucellosis as one of the differential diagnosis in all cases of PUO/acute undifferentiated fever and also in cases presenting with one of the focal lesions only especially in endemic areas.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

References

1. Pandit DP, Pandit PT. Human brucellosis: Are we neglecting an enemy at the backyard? Med J DY Patil Univ 2013;6:350-8.
2. Kavi A, Shivamallappa SM, Metgud SC, Patil VD. An epidemiological study of brucellosis in rural area of North Karnataka. Int J Med Sci Public Health 2015;4:1197-201.
3. Mantur BG, Biradar MS, Bidri RC, Mulimani MS, Veerappa K, Kariholu P, *et al.* Protean clinical manifestations and diagnostic challenges of human brucellosis in adults: 16 years' experience in an endemic area. J Med Microbiol 2006;55(Pt 7):897-903.
4. Patil DP, Ajantha GS, Shubhada C, Jain PA, Kalabhavi A, Shetty PC, *et al.* Trend of human brucellosis over a decade at tertiary care centre in North Karnataka. Indian J Med Microbiol 2016;34:427-32.
5. Mangalgi SS, Sajjan AG, Mohite ST, Kakade SV. Serological, clinical, and epidemiological profile of human brucellosis in rural India. Indian J Community Med 2015;40:163-7.
6. Agasthya AS, Isloor S, Krishnamsetty P. Seroprevalence study of human brucellosis by conventional tests and indigenous indirect enzyme-linked immunosorbent assay. ScientificWorldJournal 2012;2012:104239.
7. Mantur BG, Amarnath SK, Shinde RS. Review of clinical and laboratory features of human brucellosis. Indian J Med Microbiol 2007;25:188-202.
8. Colmenero JD, Reguera JM, Martos F, Sánchez-De-Mora D, Delgado M, Causse M, *et al.* Complications associated with *Brucella melitensis* infection: A study of 530 cases. Medicine (Baltimore) 1996;75:195-211.
9. Purwar S, Metgud SC, Darshan A, Mutnal MB, Nagmoti MB. Infective endocarditis due to *Brucella*. Indian J Med Microbiol 2006;24:286-8.
10. Seçmeer G, Ecevit Z, Gülbulak B, Ceyhan M, Kanra G, Anlar Y. Splenic abscess due to *Brucella* in childhood. A case report. Turk J Pediatr 1995;37:403-6.
11. Cózar Olmo JA, Díaz Torres MJ, Cuenca Burgos MJ, Sánchez García F, Lomeña Alvarez G. Brucellosis-induced splenic abscess. An Esp Pediatr 2002;57:593-4.
12. Espinosa BJ, Chacaltana J, Mulder M, Franco MP, Blazes DL, Gilman RH, *et al.* Comparison of culture techniques at different stages of brucellosis. Am J Trop Med Hyg 2009;80:625-7.
13. Ariza J, Pigrau C, Cañas C, Marrón A, Martínez F, Almirante B, *et al.* Current understanding and management of chronic hepatosplenic suppurative brucellosis. Clin Infect Dis 2001;32:1024-33.