

6. Rodriguez Bano J, Navarro MD, Romero L, Martinez-Martinez L, Muniain MA, Perea EJ, et al. Epidemiology and clinical features of infections caused by extended-spectrum beta-lactamase-producing *Escherichia coli* in nonhospitalized patients. *J Clin Microbiol* 2004;42:1089–94.
7. Mathur P, Kapil A, Das B, Dhawan B. Prevalence of extended spectrum beta-lactamase-producing Gram-negative bacteria in a tertiary care hospital. *Ind J Med Res* 2002;115:153–7.
8. Tankhiwale SS, Jalgaonkar SV, Ahmad S, Hassani U. Evaluation of extended spectrum beta lactamase in urinary isolates. *Ind J Med Res* 2004;120:553–6.
9. Colodner R, Rock W, Chazan B, Keller N, Guy N, Sakran W, et al. Risk factors for the development of extended-spectrum beta-lactamase-producing bacteria in nonhospitalized patients. *Eur J Clin Microbiol Infect Dis* 2004;23:163–7.
10. Pitout JD, Hanson ND, Church DL, Laupland KB. Population-based laboratory surveillance for *Escherichia coli*-producing extended-spectrum beta-lactamases: importance of community isolates with bla_{CTX-M} genes. *Clin Infect Dis* 2004;38: 1736–41.

Varsha Gupta*

Priya Datta

Department of Microbiology,
Government Medical College & Hospital,
House No. 1154-A, Sector 32-B,
Chandigarh, India

*Corresponding author. Tel.: +91 172 2647282;

fax: +91 172 2609360

E-mail address: varshagupta_99@yahoo.com

(V. Gupta)

Corresponding Editor: Timothy Barkham, Singapore

20 October 2005

doi:10.1016/j.ijid.2006.02.002

Hemophagocytosis and pulmonary involvement in brucellosis

We report the case of a 45-year-old woman who presented with fever, hepatosplenomegaly, jaundice, rash, and tachypnea. Wright's serum agglutination and 2-mercaptoethanol (2-ME) tests were both positive in the range of 1/2560 and hemophagocytosis was shown in bone marrow aspiration.

The illness began with flu-like symptoms 15 days earlier. Four days before admission she had developed jaundice, headache, myalgia, malaise, anorexia, nausea, and a productive cough. There was no history of previous disease. Her occupation involved all aspects of animal husbandry including the slaughter and skinning of animals. On physical examination, icteric sclera, blood clots in the pharyngeal pouch, ecchymosis (Figure 1), and tenderness in the right upper quadrant were found. Her platelet count at the time of admission was 13×10^9 cells/L. Twenty-four hours after admission she developed epistaxis. Oral ribavirin was started with a probable diagnosis of Crimean-Congo hemorrhagic fever.

On the second hospital day, laboratory findings were as follows: hemoglobin (Hb) 11.2 g/dL, LDH 2345 IU/L, alkaline phosphatase 391 IU/L, SGOT 277 IU/L (N <13–39), and SGPT 322 IU/L (N <27–40). Her white blood cell (WBC) count was



Figure 1 Ecchymosis of the lower limbs in a patient with brucella-induced hemophagocytosis.

5.6×10^9 cells/L, erythrocyte sedimentation rate was 8 mm/h, direct bilirubin 15.4 mg/dL, total bilirubin 22.1 mg/dL, Wright's agglutination test 1/2560, and 2-ME was 1/2560. Owing to positive Wright's agglutination and 2-ME tests, ribavirin was changed to doxycycline plus gentamicin.

Four days after admission laboratory tests revealed pancytopenia: platelet count 12×10^9 cells/L, Hb 8.5 g/dL, and WBC 3.5×10^9 cells/L. Bone marrow aspiration revealed an increase in histiocytic lineage and phagocytosis of nucleated red blood cells and platelets (hemophagocytosis). The cultures of bone marrow were negative. Other laboratory tests revealed negative blood cultures and serum ferritin >1000 ng/mL.

Five days after admission, high resolution computed tomography of the chest was performed due to persistent tachypnea and rales, and showed consolidation in both lungs. After three days of treatment with hydrocortisone (200 mg/day) and anti-brucellar drugs, the platelet count increased, liver enzymes decreased (SGPT 130 IU/L, SGOT 91 IU/L), and prothrombin time (PT) and partial thromboplastin time (PTT) returned to normal.

Mild hematologic abnormalities are common in brucellosis and usually subside with treatment of the disease itself. Thrombocytopenia may be severe and associated with purpura and bleeding. Steroids have been recommended in severe thrombocytopenia associated with human brucellosis.¹ Severe disorders such as hemophagocytic syndromes have also been described.² Hemophagocytic syndrome is associated with a broad spectrum of diseases such as viral, bacterial and mycobacterial diseases.³ Signs and symptoms of hemophagocytic syndromes are often similar to common infections or mimic fever of unknown origin or hepatitis. Fever, splenomegaly, and hepatomegaly are the most common clinical findings and lymphadenopathy, jaundice, and rashes can also be found. Hemophagocytic syndrome may result in pulmonary involvement.⁴

In daily practice, the diagnosis of brucellosis is established by a positive Wright's agglutination test in a titer of $\geq 1/160$ in association with an appropriate clinical setting.⁵ The brucella infection in our patient was established with strongly positive serology (standard tube agglutination (STA) test).

Agglutination in the presence of 2-ME was used to distinguish specific IgG (suggestive of active disease) and IgM reactivity. The test was performed in the same manner as the STA test except that sera were previously exposed to 2-ME.

The patient presented with hemophagocytic syndrome associated with brucellosis, which progressively recovered with anti-brucellar drugs and a three-day administration of hydrocortisone, leading to improvement of all hematologic, hepatic, and pulmonary changes. The large ecchymosis associated with thrombocytopenia, pulmonary involvement associated with brucella or hemophagocytosis (with negative chest X-ray), and rapid response to the short course of steroids as well as the anti-brucellar drugs were unique features of our patient. It should be said that in endemic areas, rare complications of common diseases should always be taken into account. Also, in patients with brucellosis, respiratory findings such as unexplained tachypnea accompanying a normal chest X-ray is an alarming sign pointing to a diagnosis of pneumonia, hemophagocytic syndrome, or pulmonary thromboemboli, and performing complementary radiographic imaging such as a chest CT scan may be useful and revealing.

Conflict of interest: No conflict of interest to declare.

References

1. Sevinc A, Buyukberber N, Camci C, Buyukberber S, Karsliligil T. Thrombocytopenia in brucellosis: case report and literature review. *J Natl Med Assoc* 2005;**97**:290–3.
2. Martin-Moreno S, Soto-Guzman O, Bernaldo-de-Quiros J, Reverte-Cejudo D, Bascones-Casas C. Pancytopenia due to hemophagocytosis in patients with brucellosis: a report of four cases. *J Infect Dis* 1983;**147**:4455.
3. Au WY, Kwong YL, Yuen KY. Hemophagocytosis in the peripheral blood due to tuberculosis mycobacteremia. *Am J Med* 2005;**118**: 1298–9.
4. Fitzgerald NE, MacClain KL. Imaging characteristics of hemophagocytic lymphohistiocytosis. *Pediatr Radiol* 2003;**33**:392–401.
5. Mert A, Ozaras R, Tabak F, Bilir M, Yilmaz M, Kurt C, et al. The sensitivity and specificity of Brucella agglutination tests. *Diagn Microbiol Infect Dis* 2003;**46**:241–3.

Ali Akbar Heydari*
 Fereidoun Ahmadi
 Mohammad Reza Sarvghad
 Hosein Safari
 Amir Bajouri
 Mehdi Saeidpour
 Department of Infectious Diseases,
 Imam Reza Hospital, Mashhad University of Medical Sciences,
 Mashhad, Khorasan, Iran

*Corresponding author. Tel.: +98 511 8412351;
 fax: +98 511 8412351
 E-mail address: aghileheydari@yahoo.com
 (A.A. Heydari)

Corresponding Editor: Raymond A. Smego, Sohar, Oman

3 November 2005

doi:[10.1016/j.ijid.2006.01.003](https://doi.org/10.1016/j.ijid.2006.01.003)