

## Study of some characteristic features of brucellosis in Tikrit and Samarra cities

Zedan J. Zedan , Moheeb A. Salih

Dept. of Medicine, College of Medicine, Tikrit University

### Abstract

Brucellosis is an intracellular bacterial disease, requires combined, protracted antibiotic treatment. The most common clinical features are: fever, headache, malaise, sweating, joint pain, lumbar pain, splenomegaly, Hepatomegaly, and arthritis. Clinical features and laboratory investigations form the basis for the diagnosis of brucellosis in humans. To study some characteristic features of brucellosis in Tikrit and Samarra cities. The study includes 80 patients (46 males and 34 females) from Tikrit and Samarra cities. All were reviewed with history, thorough examination, and full relevant investigations. Out of 80 patients with brucellosis, 75 had fever, 45 had headache, 42 had joint pain, 19 had malaise, 9 had sweating, 38 had arthritis (16 peripheral arthritis, 20 spondylitis, and 2 sacroiliitis), 28 had splenomegaly, 19 had hepatomegaly, 4 had lymphadenopathy, 19 had increased transaminase, 35 had elevated ESR, and 5 had elevated TSB. All these results are comparable with other studies. A titer of >1:320 BAT should be gathered with a clinical features of brucellosis as a guidance for diagnosis in Iraq , and a combined antibiotic therapy should be used in treatment with follow-up of response.

**Keywords:** Brucellosis, Clinical features.

### Introduction

Brucellosis is a bacterial zoonosis transmitted directly or indirectly to humans from infected animals, predominantly domesticated animal . The disease is known colloquially as *undulant fever* because of its remittent character (1). Human brucellosis is caused by strains of *Brucella*, *B. melitensis*, which is the commonest cause of symptomatic disease in humans and for which the main sources are sheep, goats, and camels; *B. abortus*, which is usually acquired from cattle or buffalo; *B. suis*, which is generally acquired from swine except for one variant enzootic in reindeer and caribou and another enzootic in rodents; and *B. canis*, which is most often acquired from dogs (2,3). Human brucellosis is usually associated with occupational or domestic exposure to infected animals or their products. Farmers, shepherds, goatherds, veterinarians, and workers in slaughterhouses and meat-processing plants in endemic areas are occupationally exposed to infection (4).

After entering the human body and being taken up by local tissue lymphocytes, brucellae are transferred through regional lymph nodes into the circulation and are subsequently seeded throughout the body, with tropism for the reticuloendothelial

system. The period of inoculation usually ranges from two to four weeks. The classic categorization of brucellosis as acute, subacute, or chronic is subjective and of limited clinical interest (5). Human brucellosis is traditionally described as a disease of protean manifestations. However, fever is invariable and can be spiking and accompanied by rigors, if bacteremia is present, or may be relapsing, mild, or protracted. Malodorous perspiration is almost pathognomonic.

Constitutional symptoms are generally present. Physical examination is generally nonspecific, though lymphadenopathy, hepatomegaly, or splenomegaly is often present. Osteoarticular disease is universally the most common complication of brucellosis (6), The reproductive system is the second most common site of focal brucellosis. Brucellosis can present as epididymo-orchitis in men and is often difficult to differentiate from other local disease (7).

Hepatitis is common, usually manifesting as mild transaminasemia. Liver abscess and jaundice are rare (8). Central nervous, endocrine, and respiratory systems can also be affected (9, 10, 11). The blood count is often characterized by mild leukopenia and relative lymphocytosis, along with mild anemia and thrombocytopenia.

Pancytopenia in brucellosis is multifactorial and is attributed to hypersplenism and bone marrow involvement (12,13).

Because the clinical picture of brucellosis is not distinctive, the diagnosis must be based on a history of potential exposure, a presentation consistent with the disease, and supporting laboratory findings. Routine biochemical assays are usually within normal limits, although serum levels of hepatic enzymes and bilirubin may be elevated. Peripheral leukocyte counts are usually normal or low, with relative lymphocytosis. Mild anemia may be documented. Thrombocytopenia and disseminated intravascular coagulation with raised levels of fibrinogen degradation products can develop. The erythrocyte sedimentation rate and C-reactive protein levels are often normal but may be raised (1).

The absolute diagnosis of brucellosis requires isolation of the bacterium from blood or tissue samples (14). Bone marrow cultures are considered the gold

Standard for the diagnosis of brucellosis, since the relatively high concentration of brucella in the reticuloendothelial system makes it easier to detect the organism. Furthermore, bacterial elimination from the bone marrow is equivalent to microbial eradication (15). There are two broad categories of serologic methods for diagnosing brucellosis: those based on antibody production against lipopolysaccharide and those based on antibody production against other bacterial antigens. Developed by Bruce, the serum agglutination test remains the most popular diagnostic tool for brucellosis.

Titers above 1:160 are considered diagnostic in conjunction with a compatible clinical presentation. However, in areas of endemic disease, using a titer of 1:320 as diagnostic may be more specific (16). ELISA and PCR are other tests may be used in diagnosis of brucellosis. In 1986, the World Health Organization issued guidelines for the treatment of human brucellosis.

The guidelines discuss two regimens, both using doxycycline for a period of six weeks, in combination with either streptomycin for two to three weeks or rifampin for six weeks (17).

The aim of the study is to study some characteristics of brucellosis in Tikrit and Samarra cities.

## **Patients and Methods**

The present study includes 80 patients from Tikrit and Samarra cities, 46 were males and 34 were females. The ages of patients were 15-70 years; the mean of age was 37 years.

All patients were reviewed, as outpatient and inpatient, with full history, physical examination, and serum was sent for investigations that include: Brucella Agglutination test (BAT), 2 mercapto ethanol (2ME), total serum bilirubin (TSB), Transaminase (SGOT, SGPT), and Erythrocyte sedimentation rate (ESR), in addition to other investigations to exclude other differential diagnosis such as widal test and rheumatoid factor. In addition all patients are sent for abdominal ultrasonic examination.

The diagnosis of brucellosis was undertaken when clinical features are associated with BAT titer of > 1: 320 with positive 2ME and exclusion of other possible diagnoses such as typhoid fever or rheumatoid arthritis. In addition all patients are followed up for 6 weeks to achieve full response to treatment of brucellosis. Then the results were arranged in figures and tables as frequencies using Microsoft office excel 2003.

## **Results**

Out of 80 patients with brucellosis, 75 patients (93.8%) developed fever, 45 (56.3%) had headache, 19 (23.8%) had malaise, 9 (11.3%) had sweating, and 42 (52.5%) had joint pain, table (1). Out of 80 patients with brucellosis, 38 (45.5%) developed arthritis, 28 (35%) had splenomegaly, 19 (23.8%) had hepatomegaly, and 4 (5%) had lymphadenopathy, (Table 2). While, those with arthritis, 16 (20%) had peripheral arthritis (mostly of hip and knee joints), 20 (25%) had spondylitis (mostly lumbar vertebrae), and 2 (2.5%) had sacroiliitis, figure (1).

Increased transaminase (elevated SGOT and SGPT) reported in 19 (23.8%) of patients, ESR was elevated (not exceeding

40 mm/hour) in 35 ( 43.8) of patients , while TSB was elevated ( not exceeding 3mg/dl) in only 5 ( 6.3%) of patients, table (3).

### Discussion

Human brucellosis is traditionally described as a disease of protean manifestations. However, fever is invariable and can be spiking and accompanied by rigors, if bacteremia is present, or may be relapsing, mild, or protracted. Malodorous perspiration is almost pathognomonic. Constitutional symptoms are generally present. Physical examination is generally nonspecific, though lymphadenopathy, hepatomegaly, or splenomegaly is often present (6).

The present study revealed that fever is the most common symptom, followed by headache, joint pain, malaise, and sweating respectively. These results are comparable with other study (5).

Bokuzogus B et al 2005, reported that the most common signs of brucellosis are: arthritis, splenomegally, Hepatomegally and lymphadenopathy, and those are comparable with the present findings (18).

The common types of arthritis were spondylitis (mostly of lumbar vertebrae), peripheral arthritis (especially of hip and knee joints), and sacroiliitis respectively, and these results are comparable with other study (6).

Transamnesia, mild increase in TSB and ESR found by this study are also comparable with other studies (1, 19).

The present study concludes that brucellosis, like tuberculosis, is a chronic granulomatous infection caused by intracellular bacteria and requires combined, protracted antibiotic treatment. The following points are recommended:

- 1- Iraq is an endemic area with brucellosis, so BAT of a titer > 1:320 in conjunction with clinical setting are needed to diagnose brucellosis.
- 2- Combination antibiotic therapy is needed.
- 3- Follow-up of response to treatment is needed.

### References

- 1-Corbel MJ, Beeching NJ, Brucellosis in Harrison's Principle of Internal Medicine, 16<sup>th</sup> ed, McGraw-Hill, New York, 2005:914-917.
- 2-Ewalt DR, Payeur JB, Martin BM, Cummins DR, Miller WG. Characteristics of a *Brucella* species from a bottlenose dolphin (*Tursiops truncatus*). J Vet Diagn Invest 1994;6:448-52.
- 3- Ross HM, Jahans KL, MacMillan AP, Reid RJ, Thompson PM, Foster G. *Brucella* species infection in North Sea seal and cetacean populations. Vet Rec 1996;138:647-8.
- 4- Almuneef MA, Memish ZA, Balkhy HH, et al. Importance of screening household members of acute brucellosis cases in endemic areas. Epidemiol Infect 2004;132:533-40.
- 5- Pappas G, Akritidis N, Bosilkovski M, Tsianos E, Brucellosis, N Engl J Med 2005;352:2325-36.
- 6- Bosilkovski M, Krteva L, Caparoska S, Dimzova M. Hip arthritis in brucellosis: a study of 33 cases in the Republic of Macedonia (FYROM). Int J Clin Pract 2004;58: 1023-7.
- 7- Navarro-Martinez A, Solera J, Corredoira J, et al. Epididymo-orchitis due to *Brucella mellitensis*: a retrospective study of 59 patients. Clin Infect Dis 2001;33:2017-22.
- 8- Ariza J, Pigrau C, Canas C, et al. Current understanding and management of chronic hepatosplenic suppurative brucellosis. Clin Infect Dis 2001;32:1024-33.
- 9- Shakir RA, Al-Din AS, Araj GF, Lulu AR, Mousa AR, Saadah MA. Clinical categories of neurobrucellosis: a report on 19 cases. Brain 1987;110:213-23.
- 10- Reguera JM, Alarcon A, Miralles F, Pachon J, Juarez C, Colmenero JD. *Brucella* endocarditis: clinical, diagnostic, and therapeutic approach. Eur J Clin Microbiol Infect Dis 2003;22:647-50.
- 11- Pappas G, Bosilkovski M, Akritidis N, Mastora M, Krteva L, Tsianos E. Brucellosis and the respiratory system. Clin Infect Dis 2003;37:e95-e99.
- 12- Young EJ, Tarry A, Genta RM, Ayden N, Gotuzzo E. Thrombocytopenic purpura associated with brucellosis: report of 2 cases and literature review. Clin Infect Dis 2000; 31:904-9.

13- Pappas G, Kitsanou M, Christou L, Tsianos E. Immune thrombocytopenia attributed to brucellosis and other mechanisms of Brucella-induced thrombocytopenia. Am J Hematol 2004;75:139-41.

14- Memish Z, Mah MW, Al Mahmoud S, Al Shaalan M, Khan MY. Brucella bacteraemia: clinical and laboratory observations in 160 patients. J Infect 2000;40:59-63.

15- Gotuzzo E, Carrillo C, Guerra J, Llosa L. An evaluation of diagnostic methods for brucellosis — the value of bone marrow culture. J Infect Dis 1986; 153:122-5.

16- Araj GF. Human brucellosis: a classical infectious disease with persistent diagnostic challenges. Clin Lab Sci 1999;12:207-12.

17- Solera J, Martinez-Alfaro E, Saez L. Meta-analysis of the efficacy of rifampicin and doxycycline in the treatment of human brucellosis. Med Clin (Barc) 1994;102:731-8.

18- Dokuzoguz B, Ergonul O, Baykam N, et al. Characteristics of *B. melitensis* versus *B. abortus* bacteraemias. J Infect 2005; 50:41-5.

19- Cervantes F, Bruguera M, Carbonell J, Force L, Webb S. Liver disease in brucellosis: a clinical and pathological study of 40 cases. Postgrad Med J. 1982; 58:346-50.

**Table (1):** Frequency of symptoms in brucellosis patients

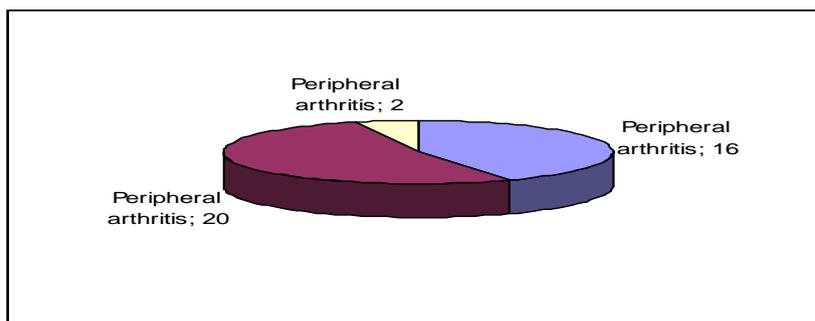
Symptoms	Number	percentage
Fever	75	93.8
Headache	45	56.3
Malaise	19	23.8
Sweating	9	11.3
Joint pain	42	52.5

**Table (2):** Frequency of signs in brucellosis patients

Sign	Number	Percentage
Arthritis	38	45.5
Splenomegaly	19	35
Hepatomegaly	19	23.8
Lymphadenopathy	4	5

**Table (3)** Frequency of elevated investigations in brucellosis patients

Investigation	Number	Percentage
Increased transaminase	19	23.8
Increased ESR	35	43.8
Increased TSB	5	6.3



**Figure (1):** Types of arthritis in brucellosis patients