Cardiac involvement in acute brucellosis At Toukh Fever Hospital

Fawzy M. Khaleil, Mohamed A. Elassal, Ramy A. Samy, Mohamed M. Abd Ellatif, Sabah S. Sabek

Department of Internal Medicine, Benha University, Benha, Egypt
dr_sabah24@yahoo.com

Abstract: Objective: Aim of this study is to clarify cardiac involvement in patients with acute brucellosis. **Participants and methods:** In this study fifty brucellosis patients were selected and subjected to different serum analysis including: CBC, CRP, ESR, ALP, PT, PTT, INR, Brucella agglutination test, AST, ALT, CPK, CKMB, serum bilirubin, serum urea, serum creatinine, abdominal ultrasound, chest X-ray, Echocardiography. **Results**: Chest X-ray revealed free 49 (98%), heart enlargement 1 (2%). Echocardiography revealed normal 49 (98%), low amplitude 1(2%), Echo- revealed49 (98%) of studied patients were of normal Echo-, while 1 (2%) had pericardial effusion. Abdominal US revealed normal 39 (78%), liver enlargement 5 (10%), spleen enlargement 5 (10%), liver enlargement & liver mass 1 (2%). **Conclusion:** In the study the musculoskeletal system is the most affected part of the body. The prevalence of cardiac affection in Malta fever in this study was 2%.
[Fawzy M. Khaleil, Mohamed A. Elassal, Ramy A. Samy, Mohamed M. Abd Ellatif, Sabah S. Sabek. **Cardiac involvement in acute brucellosis At Toukh Fever Hospital.** *J Am Sci* 2016;12(10):3-7]. ISSN 1545-1003 (print); ISSN 2375-7264 (online). http://www.jofamericanscience.org. 2. doi:10.7537/marsjas121016.02.

Keywords: Cardiac involvement, acute brucellosis

1. Introduction and aim of the work

Brucellosis is disease affecting domestic animals. This transmitted to human by contact with milk, urine and genital organs. The disease is acquired from unpasteurized milk and its products, under cooked meat, laboratory inhalation and accidental skin penetration or abrasion (farmers, slaughter house workers)**(1).**

Brucella species: brucella abort us from cattle, brucella melitenesis from goats or sheeps (the most virulent, it is the main cause in Egypt), brucellasuis from pigs, brucellacannis from dogs, brucellaovis from sheep **(1).**

The taxonomy of Brucella species is still unclear and unresolved. Based on 16S rRNA gene sequences, Brucellae are categorized as α-2 proteobacteria and have close phylogenetic relationships with Agro bacterium, Rickettsia, Rhizobium and Rhodobacter**.(2).**

Brucella have been classified according to differences in pathogenicity and host preference, into six species: Brucella (B. melitensis, B. abortus, B. suis, B. ovis, B. canis and B. neotomae). In fact Verger and colleagues used DNA-DNA hybridization studies to investigate 51 Brucella strains of all species and found them to be identical. **(3).**

Acute brucellosis is presented by constitutional manifestations (fever, anorexia, nausea, vomiting). Gastrointestinal manifestations (abdominal pain, diarrhea, hepatosplenomegaly). Musculoskeletal manifestations (arthritis, spondylitis, osteomyelitis). Neurological symptoms include meningitis, encephalitis, peripheral neuropathy, and intracerebral abscesses, neck rigidity.

Although cardiovascular involvement is low (endocarditis at 20%), it is the major cause of mortality. Pulmonary infection can be from inhalation or hematogenous spread. Genitourinary infection can include epidydmo-orchitis or pyonephrosis. Skin manifestations are not specific. Hematological complication includes anemia, leucopenia and thrombocytopenia. **(4)**

Brucellosis diagnosed by symptoms, signs, blood culture on Castaneda medium, PCR, serum agglutination with titre more than 1/160, ELISA is probably the second most common serologic method **(5)**

Cardiovascular complications of brucellosis are very rare in the form of endocarditis which is the most common cardiovascular involvement of the disease, myocarditis, and pericarditis. The aortic valve and less frequently mitral valve are affected. The cardiac damage may be due to direct effect of micro-organism or by local deposition of immunocomplexes. **(6)**

Treatment of brucellosis is by some methods as good hygiene, sanitation of milk and its products, health education for those who are in contact with diseased animals, bed rest, small meals, three week course of Rifampicin and Doxycycline twice daily is the combination most often used and appear to be effectious.**(7).**

This work aims to clarify cardiac involvement in patients with acute brucellosis.

2. Participants and method

This study is conducted on (50) patients who were subjected to the following:

- History talking, including age, sex, occupation, address, marital status, habits, past history of any diseases, family history, and any present complaint.
- Clinical examination including general and systemic examination.
- laboratory testes including: CBC, erythrocyte sedimentation rate, C - reactive protein, brucella tube agglutination test, CPK, CKMB, PT, PTT, INR, AST, ALT, alkaline phosphatase, serum bilirubin, serum urea, serum creatinine.
- Radiological examination including, abdominal ultrasound, and chest X ray.
- ECG.
- Patients were diagnosed by history, clinical findings and laboratory tests, including leukocyte count, erythrocyte sedimentation rate, C-reactive protein (CRP; CRP Latex reagent cromatest, Linear Chemicals, SL, Barcelona, Spain), standard tube agglutination test (Brucella tube agglutination test, Veterinary Control and Research Institute, Pendik, Istanbul, Turkey), creatine phosphokinase, creatine kinase MB, prothrombin time, partial thromboplastin time, INR, AST, ALT, alkaline phosphatase, serum bilirubin, serum urea, serum creatinine, and radiological findings (Echo, abdominal sonography and chest X-ray) and ECG.

The patients were informed about the purpose of the study and written consent was obtained.

Patients with acute brucellosis received rifampicin (600 mg daily, single dose, orally) plus doxycycline (200mg twice a day, orally) for 45 days.

On the 21st and 45th days of the therapy, patients were reevaluated clinically and biochemically.

3. Results

Abdominal examination revealed 5(10%) hepatomegaly, 5(10%) splenomegaly**.**

ESR: maximum (65), minimum (5), Mean ± SD (24.2±14.3). CPK: maximum (65), minimum (30), Mean ± SD (44.4±10.3). CKMB: maximum (18), minimum (2), Mean ± SD (8.0±4.3).

Table 1: ESR, CPK, CKMB

Variable	Mean ± SD	Minimum	Maximum
ESR	24.2±14.3	5	65
CPK	44.4±**10.3**	30	65
CKMB	8.0±**4.3**	2	18

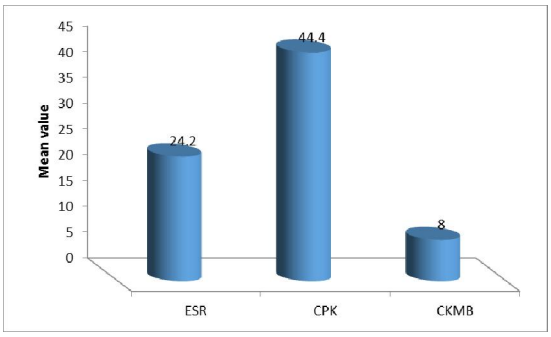

Figure 1: ESR, CPK, CKMB

Chest X ray revealed free 49 (98%), cardiomegaly 1 (2%).

Table 2: chest X-ray

CXR	Frequency	Percent
Free	49	98.0
Cardiomegaly	1	2.0
Total	50	100.0

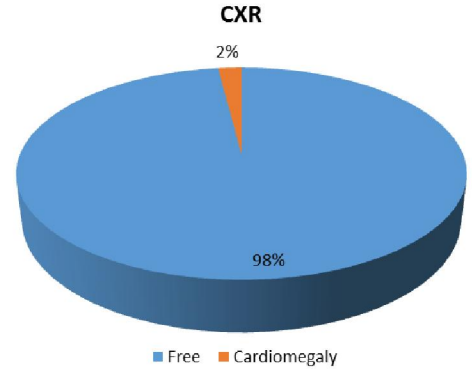

Figure 2: chestX-ray

ECG revealed normal 49 (98%), low amplitude 1 (2%).

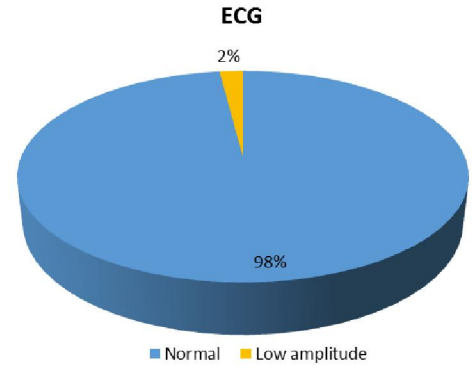

Figure 3: ECG

Cardiograph revealed 49 (98%) of studied patients were of normal Echo- **Echo-**cardiography, while 1 (2%) had pericardial effusion.

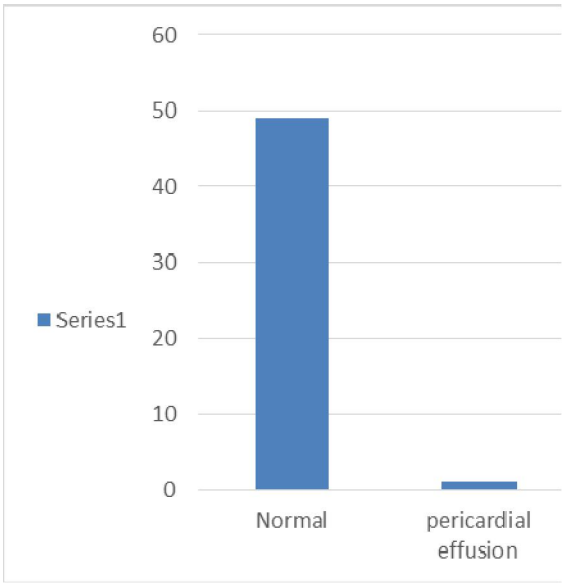

Figure 4: Ecchocardiograph

Abdominal US revealed normal 39 (78%), hepatomegaly 5 (10%), splenomegaly 5 (10%), hepatomegaly & liver mass 1 (2%).

Table 3: Abdominal US

Abdominal US	Frequency	Percent
Normal	39	78.0
Hepatomegaly	5	10.0
Splenomegaly	5	10.0
Hepatomegaly & liver mass	1	2.0
Total	50	100.0

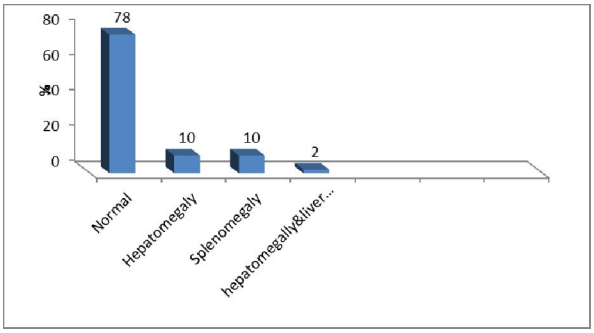

Figure 5: abdominal US

4. Discussion

In the current study which carried out on 50 patients with acute brucellosis the Fever is the most common symptom and sign of brucellosis, occurring in (80-100%), In the current study fever resembles 100% of cases. This agrees with **(Memish Z et al 2000)** study as fever resembles 91.3%, and **(Ruiz-Mesa JD et al 2005)** study fever was 98.75%, and **(Andriopoulos P et al 2007)** study fever was 100% **(8,9 & 10).**

Arthralgia in the current study was 72% this agrees with **(Kokoglu OF et al 2006)** study in which arthralgia was 77.55% and **(Tsolia M et al 2002)** study in which arthralgia was 69% osteoarticular involvement was 28.3%.**(11 & 12)**

Hepatomegaly in our study was 10% this agrees with **(Mantur BG et al 2006)** study in which hepatomegaly was 11.3% and disagrees with **(Lulu AR et al 1988)** reported 40% hepatic involvement in their study, namely 1% clinical hepatitis and 38.5% anicteric hepatitis. **(13 & 14)**

Splenomegaly in the current study was 10% which agree with **(Pappas G et al 2005)** study in which the percentage was 16% and **(Troy SB et al 2005)** in which the percentage was 18% **(15 & 16)**

Cardiovascular complications of brucellosis (endocarditis, myocarditis and pericarditis) are rare. In cases of endocarditis, which is the most common cardiovascular involvement of the disease, the aortic valve and less frequently the mitral valve are affected. No good response to medical therapy has been observed, and there is poor prognosis without surgery. Although the mortality rate for brucellosis is less than 1%, endocarditis accounts for 80% of these deaths. The complication that is responsible for the majority of deaths is heart failure. **(17).**

In our study on 50 patients with acute brucellosis the cardiac affection occur in only one case (2%) in the form of pericardial effusion. The diagnosis is confirmed by chest X ray which revealed cardiomegaly, ECG which revealed low amplitude and transthoracic echocardiography. Our study agrees with a prospective study of 400 cases from Kuwait in which cardiac affection was 2% of cases, only two cases with endocarditis and an additional six cases of other cardiovascular complications (including one case of myocarditis) were reported **(18).**

Reported three more cases of brucella myocarditis in a series of 200 children with brucellosis, and myocarditis has also been described in a case of disseminated brucellosis with multiple organ involvement. **(19 & 14)**

(Akdeniz, H et al 1998) Reported an incidence rate of 1% in their study. Cardiovascular involvement rates in large epidemiological studies are reported at between 1% and 2.3% **(20).**

In our study, the constitutional symptoms were predominant and the pericardial effusion was asymptomatic. This suggests that this unusual feature could be underestimated if Echocardiography is not in routine use.

The cardiac damage may be due to a direct effect of the microorganism as suggested by pericardial fluid cultures, or by local deposit of immunocomplexes as seen in cardiac biopsies. The diagnosis is based on the demographic and epidemiologic characteristics of the disease, the presence of symptoms, results of serological tests, isolation of the microorganism by blood or bone marrow cultures, and exclusion of other possible causes of pericardial effusion and myocarditis. Pericardiocentesis and heart biopsy remain the techniques of choice for supporting a definite diagnosis of Brucella related involvement of the heart, but these interventional investigations are not easily performed for diagnosis in routine clinical practice and add no additional information when a safe diagnosis has already been made by other means. **(21)**

We treated our patient with triple antibiotic therapy only (without non-steroidal anti-inflammatory drugs or prednisolone). The response was complete, with no signs of relapses during the follow-up period. Although endocarditis was not found, our patient received treatment for three months because we believe that cardiac involvement (even in the absence of endocarditis) along with repetitive positive blood cultures cannot be safely considered an uncomplicated form of the disease while we lack evidence-based data from large prospective studies on the treatment of cardiovascular features of this disease in the absence of concomitant endocarditis.

From this analysis, we concluded that the cardiac affection with brucellosis is rare about (0: 2%). From the serum analysis which held in this study, we did not find a noticeable change in either Hemoglobin or platelets due to infection but there is a noticeable increase in both CRP and ESR due to the infection.

Financial support and sponsorship:

Nil

Conflicts of interest:

There are no conflicts of interest

References

1. Ertem M, Kurekci AE, "Brucellaspesies", 2009, APPENDIX 2, volume 49.
2. Moreno E, Stackebrandt E, Dorsch M, Wolters J, Busch M and Mayer H.(1990): Brucella abortus 16S rRNA and lipid A reveal a phylogenetic relationship with members of the alpha-2 subdivision of the class Proteobacteria. J Bacteriol;172:3569-76.
3. Verger JM, Grimont F, Grimont PA and Grayon M.(1985): Brucella, a monospecific genus as shown by deoxyribonucleic acid hybridization. Int J Syst Bacteriol;35:292-5.
4. *Hofer E,* "Microbiological diagnosed of Brucellassp. And Austrian epidemiology of brucellosis (Bsuisbiovar 2)", 2009, Institute for Veterinary Disease Control, Modling.
5. Poster F, Nielsen K, "Diagnosis of Brucellosis", 2010, the Open Veterinary Science Journal, 4, 46-60.
6. Hatipoglu CA, Yetkin A, Ertem GT, Tulek N: Unusual clinical presentations of brucellosis. *Scand J Infect Dis* 2004, 36:694.
7. Ariza J, Gudiol F, Valverde J, et al. Brucellar spondylitis: a detailed analysis based on current findings. *Rev Infect Dis*. 1985 Sep-Oct. 7(5):656-64.
8. Memish Z, Mah MW, Al Mahmoud S, Al Shaalan M, Khan MY. Brucella bacteremia: clinical and laboratory observations in 160 patients. *J Infect*. 2000 Jan. 40(1):59-63.
9. Ruiz-Mesa JD, Sánchez-Gonzalez J, Reguera JM, Martín L, Lopez-Palmero S, Colmenero JD. Rzose Bengal test: diagnostic yield and use for the rapid diagnosis of human brucellosis in emergency departments in endemic areas. *Clin Microbiol Infect*. 2005 Mar.
10. Andriopoulos P, Tsironi M, Deftereos S, Aessopos A, Assimakopoulos G. Acute brucellosis: presentation, diagnosis, and treatment of 144 cases. *Int J Infect Dis*. 2007 Jan. 11(1):52-7.
11. Kokoglu OF, Hosoglu S, Geyik MF, Ayaz C, Akalin S, Buyukbese MA, et al. Clinical and laboratory features of brucellosis in two university hospitals in Southeast Turkey. *Trop Doct*. 2006 Jan. 36(1):49-51.
12. Tsolia M, Drakonaki S, Messaritaki A, Farmakakis T, Kostaki M and Tsapra H (2002): Clinical features, complications and treatment outcome of childhood brucellosis in central Greece. J Infect;44:257-62.
13. Mantur BG, Biradar MS, Bidri RC, Mulimani MS, Veerappa, Kariholu (2006): Protean clinical manifestations and diagnostic challenges of human brucellosis in adults: 16 years' experience in an endemic area. J Med Microbiol 2006; 55:897-903.
14. Lulu AR, Araj GF, Khateeb MI, Mustafa MY, Yusuf AR and Fenech FF.(1988): Human brucellosis in Kuwait: A prospective study of 400 cases. Q J Med;66:39-54.
15. Pappas G, Akritidis N, Bosilkovski M and Tsianos E.(2005) Brucellosis. N Engl J Med;352:2325-36.

16. Troy SB, Rickman LS, Davis CE. Brucellosis in San Diego: epidemiology and species-related differences in acute clinical presentations. *Medicine (Baltimore)*. 2005 May. 84(3):174-87.
17. Kula S, Erer D, Buyukates M, and Tunaoglu FS, Olgunturk R, Ozdogan EM: Brucella endocarditis: case report and review of the literature. J Heart Valve Dis 2001, 10:486-8.
18. Lubani M, Sharda D, Helin I: Cardiac manifestations in brucellosis. Arch Dis Child 1986.
19. Khorvash F, Keshteli AH, Behjati M, Salehi M, Emami Naeini A: An unusual presentation of brucellosis, involving multiple organ systems, with low agglutinating titers: a case report. J Med Case Reports 2007, 1:53.
20. Akdeniz, H., Irmak, H., and Demiröz, A.P. Evaluation of brucellosis cases in Van region of Eastern Anatolia: a-3 year experience. Nagoya Med. J. 1998; 42: 101–110.
21. Ugartemendia MC, Curos-Abadal A, Pujol-Rakosnik M, Pujadas-Capmany R, Escriva-Montserrat E, Jane-Pique J: Brucella melitensis pericarditis. *Am Heart J* 1985, 109:1108.

10/8/2016