HUMAN BRUCELLA INFECTIVE ENDOCARDITIS

C. KELEŞ, MD,
M. ŞİŞMANOĞLU, MD,
M.GÜLER, MD,
H. B. ERDOĞAN, MD,
V. KUTAY, MD,
M. B. RABUŞ, MD,
E. AKINCI, MD
A. GÜRBÜZ, MD,
T. BERKİ, MD,
Ö. IŞIK, MD,
C. YAKUT, MD

Brucella infective endocarditis is a lethal complication of human brucellosis, which is rarely seen and hardly described. In the present report, three successfully treated cases of brucella infective endocarditis involving native mitral and aortic valves and a mitral bioprosthesis, are described. The diagnosis of brucella endocarditis was based on clinical features, high brucella serologic titers and positive blood cultures. All of the three cases had positive blood cultures but tissue culture results were negative. By two dimensional echocardiogram, moderately large vegetations were revealed on the native aortic and mitral valves, and on the mitral bioprosthetic valve. All patients were treated with a combination of surgical and medical therapy. In two cases, a combination of rifampicin, streptomycin and doxycycline, and in one case a combination of rifampicin, tetracycline and cotrimoxazole were started after the diagnosis and used until postoperative sixth month. Infected native valves and bioprosthesis were replaced by mechanical valves. No early or late mortality, or recurrent infection was observed during 28 monthly follow-up period.

Key words: Brucellosis, cardiac involvement, infective endocarditis.

From: Koşuyolu Heart and Research Hospital, Kadıköy, İstanbul

Adress for reprints:
Cüneyt KELEŞ, MD
Department of Cardiovascular Surgery, Koşuyolu Heart and Research Hospital, 81020, Kadıköy, İstanbul, Türkiye
Phone: 90-216 326 69 69
Fax: 90-216 339 04 41

Brucellosis is still a frequently seen major infectious disease particularly in the Mediterranean, the Middle East, Central and South American countries (1,2). There are a wide variety of clinical presentations of brucella including arthritis, cardiac brucellosis and neurobrucellosis (3). Complications of brucella infection are observed in 10-15% of the cases, frequently affecting the skeletal and genitourinary system; rarely neurologic and cardiac involvement may occur. Endocarditis and myocarditis are rare but most serious complications of brucellosis (4). A patient presenting with a heart murmur who has a history of ingestion of unpasteurized milk and exposure to infected animals or animal products should be considered as having cardiac manifestations of brucellosis until proved otherwise. In infective endocarditis of brucellosis, most frequently isolated species are B. melitensis and B. abortus; despite having an incidence of less than 2%, these two species are the etiologic factor in most of the mortal infections (5).

Brucella is a common disease in some parts of the world. According to WHO, 500.000 new cases, mainly infected by B. Melitensis, are reported annually (6). Although typical brucellosis is easily diagnosed

in endemic areas, in other regions where the incidence brucella is very low, definitive diagnosis of the infection is quite difficult.

PATIENTS AND METHODS

In the present report, three cases of brucella endocarditis that were successfully treated with a combination of surgical and medical therapy, are described. In last year, three patients who were suspected to have brucella infective endocarditis were admitted to Koşuyolu Heart and Research Hospital.

The diagnosis of brucella endocarditis was based on physical examination, laboratory findings, serologic tests, blood cultures, electrocardiogram, and transthoracic and transesophageal echocardiography.

Of the three patients, two were male and one was female. Average age was 45 (ranged from 41 to 52). Symptoms have appeared 2-8 months before their admission to the hospital. At their admission, functional capacity of the two male patients were at New York Heart Association (NYHA) class IV, and the female patient who had a bioprosthesis mitral valve replacement six years ago was at NYHA class II. Case 2 male patient also had a history of transient ischemic cerebral attack that resulted with aphasia. One of the two male patients (Case 3) had a rheumatic heart valve disease diagnosis which was treated with prophylactic penicillin therapy and has been followed up regularly (Table 1).

At the admission, all patients had a temperature of 38°C and above. Case 2 had pulmonary edema due to a mitral and aortic valve incompetence that had abruptly begun. Case 3 was in congestive heart failure status due to aggravation of aortic valve insufficiency.

Laboratory findings: In all patients, white blood cell count was between 4900 and 7600/mm3 and ESR was increased (50-90 mm/h).

Telecardiography: All patients had moderate cardiomegaly and pulmonary congestion.

ECG: Case I had atrial fibrillation, while Case 2 and 3 were on normal sinus rhythm. In case 3, nonspecific ST/T segment changes were detected. None of the patients had conductance abnormality.

Echocardiography: Large vegetations were revealed on mitral bioprothesis in case I, both on mitral and aortic valve in case 2 and only on aortic valve in case 3 (Figure 1). Vegetation was pediculated and prolapsed to the Left Ventricle Outflow Tract (LVOT) in case 1 and also there was a thrombus in the left atrium. Case 1 and 2 had severe mitral regurgitation. Case 2 and 3 had severe aortic valve incompetence.

Serology: High brucella agglutination titers were obtained in all patients. In spite of the medical therapy, all titers remained high until the operation.

Blood culture: In blood cultures of all patients, grown Brucella sp. were identified.

Cardiac catheterization was carried out in none of the patients due to increased risk of embolism and presence of pulmonary edema.

Table 1. Symptoms at the admission.

	Case 1	Case 2	Case 3
Age/Sex	42/F	52/M	41/M
Raw milk ingestion	+	+	+
Period with fever	2 months	8 months	7 months
Weakness or weight loss	+	+	+
Nocturnal sweating	+	+	+
Dyspnea	+	++	++
NYHA class	II	IV	IV
Embolic episodes	-	+ (CVA)	-
Known valve disease	+	-	+

NYHA: New York Heart Association, CVA: Cerebrovascular accident.

Figure 1. Echocardiographic view with vegetation on aortic valve (Case 3).

Treatment: Previous antimicrobial therapy was maintained until the operation. Rifampicin, streptomycin and doxycycline combination was given to case 1 and 2, while case 3 was given rifampicin, tetracycline and cotrimoxazole therapy.

All patients were operated within the acute phase of the infection. Operation indications were: prevention of cerebral embolism due to mobile vegetation which was situated on the LVOT and on the bioprosthesis mitral valve in case 1, prevention of acute left ventricular failure and pulmonary edema as a result of severe aortic and mitral insufficiency in case 2 and prevention of severe aortic insufficiency in case 3. In the operation, when the heart valves were explored, degenerative mitral bioprosthesis and pediculated vegetation were observed in case 1. In case 2, vegetation and destruction of noncoronary cusp (NCC) of the aortic valve, laceration of the mitral anterior cusp and vegetation on the midsegment and free wall were noted. A coronary anomaly was observed where right coronary artery originated from noncoronary sinus of Valsalva (Figure 2 and 3). In case 3, there were fresh vegetations and abscess formation at the level of right coronary cusp (RCC) and commissure of the left coronary cusp (LCC) and RCC (Figure 4). In case 1, left atrial thrombectomy and replacement of mitral valve using a 27 mm Medtronic Hall mechanic valve, in case 2 aortic valve replacement with a 23 mm Silzone St-Jude valve and mitral valve replacement with a 27 mm Silzone St-Jude valve, in case 3 aortic valve replacement with a 21 mm Silzone St-Jude valve were carried out (Table 2). None of the patients needed an

Figure 2. Intraoperative view of aortic cusps (Case 2).

Table 2. Preoperative and perioperative characteristics.

	Case 1	**Case 2**	**Case 3**
Involved valve	mitral (bioprosthesis) vegetation	aortic, mitral vegetation	aortic vegetation
Echocardiography	MI	AI, MI	AI
Medical treatment	rifampicin streptomycin doxycycline	rifampicin streptomycin doxycycline	rifampicin tetracycline cotrimoxazole
Indications for operation	high cerebrovascular embolism risk due to vegetation on the prosthetic valve	pulmonary edema and LV failure due to severe AI and MI	pulmonary edema and LV failure due to severe AI
Operation	LA thrombectomy MVR (No 27, Medtronic)	AVR (No 23, Silzone-St. Jude) MVR (No 27, Silzone-St. Jude)	AVR (No 21, Silzone-St. Jude)

ESR: erythrocyte sedimentation rate, MI: mitral insufficiency, AI: aortic insufficiency, LV: left ventricle, LA: left atrium, AVR: aortic valve replacement, MVR: mitral valve replacement.

Figure 3. Intraoperative view of aortic cusps (Case 2).

Figure 4. Intraoperative view of aortic cusps (Case 3).

inotropic agent or an intra-aortic balloon pump support. There was no operative mortality. Inflammatory cell infiltration was observed in tissue specimens of all cases, but no microorganisms grew on tissue cultures.

Postoperative follow-up: In all patients, Brucella titers, blood cultures and echocardiography was repeated in every three months within postoperative first year. Decreasing Brucella titers were obtained by postoperative sixth month. In control echocardiography, no vegetations were detected; and all blood cultures were negative during postoperative follow-up period. In postoperative 28th month, there were no recurrences in follow-up examination.

CONCLUSION

The most common causative organisms of human brucellosis are Brucella melitensis, B. abortus, and B. suis. B. canis is a rare causative factor. (6).

Brucellosis is primarily found in animals and is spread to human through direct contact with infected tissue or ingestion of infected animal products, most commonly by milk or milk products (6). Cardiac involvement is an uncommon complication of Brucella infection. A frequently seen cardiac involvement, endocarditis is the most common cause of death in brucellosis (3,4,6,7). In endocarditis, usually B. abortus and B. melitensis are isolated (5). In 75% of the cases the aortic valve is involved; mitral, both mitral and aortic and prosthetic valve involvement occur at an equal rate of 8.3% (4,6,8). Aorticoannular abscesses, sinus of Valsalva aneurysms and dissecting aortic aneurysms were defined. Disseminated intravascular coagulation was also seen in one case as a complication of Brucella endocarditis (8).

Myocarditis is another rare complication of adult brucellosis which is associated with a prolonged PR interval and T segment changes initially (3). Atrioventricular or right bundle branch block was observed in fulminant cases of brucella myocarditis with intensive lymphocytic and polymorphonuclear cell infiltration (3,4). Peery and Belter found endocarditis in 80% and myocardial abscess in 43% of a series including 44 necropsies on cases of fatal brucellosis (3). Dalrymple-Chammeys observed only five cases of endocarditis (0.3 %) among 1500 cases of human brucellosis in England over a period of 43 years. Vogher, Dainey and Bridges reported the rate of Brucella infective endocarditis as 0.7 % (3). Minor cerebrovascular embolic accidents may be

6. Jeroudi MO, Halim MA, Harder EJ, M. Badawi Al-Siba'I MB, Ziady G, Mercer EN: Brucella Endocarditis. Br Heart J 1987; 58:279-83.
7. Cisneros JM, Pachon J, Cuello JA, Martinez A: Brucella endocarditis cured by medical treatment. J Inf Dis 1989; 160:907.
8. Al-Kasab S, Al-Fagih MR, Al-Yousef S, Ali Khan MA, Ribeiro PA, Nazzal S, and Al-Zaibag M: Brucella infective endocarditis: successful combined medical and surgical therapy: J Thorac Cardiovasc Surg 1988; 95:862-7.
9. Baldi PC, Miguel SE, Fossati CA and Wallach JC: Serological follow-up of human brucellosis by measuring IgG antibodies to lipopolysaccharide and cytoplasmic proteins of brucella species. Clin Inf Dis 1996; 22:446-55.