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### RESEARCH ARTICLE

#### TITLE PAGE: BRUCELLA ENDOCARDITIS: FROM NON-ENDEMIC AREA: A CASE REPORT.

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#### Abstract

Brucellosis is an anthroponosis caused by *Brucella melitensis*, *B.abortus*, *B.suis* and few other species of Brucella. It has worldwide distribution. It can be asymptomatic infection on one hand and the other hand it can cause serious debilitating disease, if left untreated can be fatal. We hereby report a case of Brucellosis with endocarditis as a complication and multisystem involvement which proved to be fatal in spite of treatment.

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#### Introduction:-

Brucellosis is a zoonotic infection caused by *Brucella melitensis*, *B.abortus*, *B.suis* and few other species of Brucella. These organisms are capable of surviving and even multiplying within the cells of mononuclear phagocytic system which could explain high frequency of long illness, complications and relapses<sup>1,2</sup>. Case reports have reported patients with endocarditis, arthritis and spondylitis. Its high degree of morbidity, both for animals and humans, is an important cause of economic losses and represents a serious health problem in many developing countries<sup>4,5,6</sup>. Organisms from the infected animal enter the human body through open wounds, conjunctiva, inhalation or by ingestion of products from infected animals. As this organism is an intracellular pathogen, it affects the reticuloendothelial system. The mechanism by which Brucella avoids intracellular killing is not completely understood. The incubation period is usually about 10-30 days, but sometimes prolonged. Clinical manifestations of Brucellosis vary greatly ranging from asymptomatic infection to serious debilitating disease. Brucella infection can affect different organs and systems and disease course may be complicated by severe and or rare life threatening clinical entity such as neurobrucellosis and endocarditis. Symptoms are non specific, including fever, chills, weight loss, sweats, headache, muscle ache, fatigue and depression. Lymphadenopathy and splenomegaly are common in physical findings.

#### Case Report:-

A 50 year old male patient was admitted with complaints of fever on and off since 4 months. Systemic examination revealed pallor, ejection systolic murmur grade 3 in aortic area, Hepatosplenomegaly and erythematous maculopapular and papulonodular lesions. 2D Echo showed features suggestive of Rheumatic heart disease (Moderate aortic stenosis, vegetation attached to aortic valve). USG of abdomen showed Hepatosplenomegaly, Grade 2/3 MRD and mild ascites. Blood investigations revealed pancytopenia and deranged RFT and LFT. Skin biopsy of the lesions revealed Leucocytoclastic vasculitis. Three blood samples were collected for blood culture,

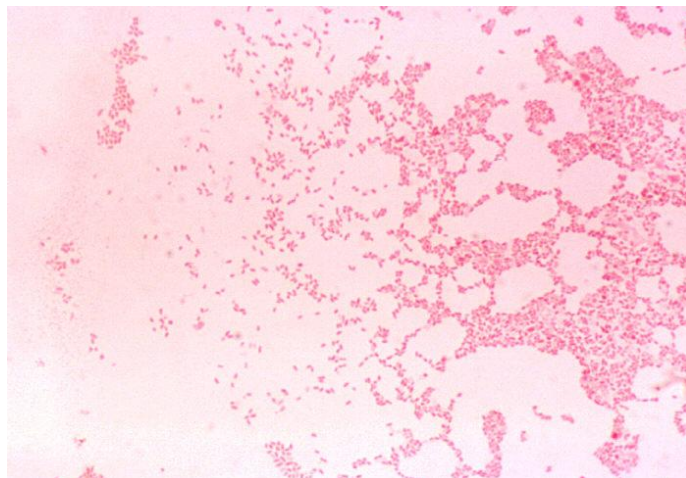
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first and the last sample 1 hour apart from 3 different sites under strict aseptic technique. He was treated empirically with antibiotics (Inj.Ceftriaxone). Blood cultures were positive for *Brucella melitensis* after 48 hours of incubation and were detected by Biomeriux BacT Alert 3D 60. The blood samples were sub cultured on Blood Agar, Chocolate Agar and MaC conkey Agar for isolation of the pathogen.



**Figure 1:-** showing colonies of *B.melitensis* on chocolate agar



**Figure 2:-** showing gram negative coccobacillary forms of *B.melitensis*



**Figure3:-** Biomeriux Bac T Alert 3D 60

This is a closed system and works on the colorimetric principle of detection of CO<sub>2</sub>, produced by the organisms. The CO<sub>2</sub> causes a lowering of the pH of the medium which in turn produces a colour change in a sensor attached to the CO<sub>2</sub> sensitive base of each bottle.

## Principles of functioning of BacT alert Monitors

- Microorganisms multiply in the media, generating CO<sub>2</sub>. As CO<sub>2</sub> increases, the sensor in the bottle turns a lighter colour.
- Measuring reflected light, the BacT/ALERT 3D monitors and detects color changes in the sensor.
- Algorithms analyze the data to determine positivity, and the laboratory is notified immediately with visual and audible alarms.



**Figure4:-**Showing the Blood culture Results





**Vitek 2 compact machine.**

**Components** -1.Vitek 2 compact 2.Compact workstation  
3.Barcode Scanner 4.Shared Printer 5.UPS 6.Power Conditioner 7.Test Cassettes 8.DensiCHECK Plus

**Figure6:- Vitek card****Figure5:-Vitek 2**

The VITEK 2 compact system is an automated microbiology bacterial identification and antimicrobial susceptibility system. It uses an advanced colorimetry technology to determine individual biochemical reactions contained in a variety of microbe identification cards. After inoculation of standardized suspension of the unknown organism, each self contained cards is incubated and read by the instrument's internal optics. The comparison of the results to known species specific reactions in the VITEK 2 database yields organism identifications.

There was no growth on MaC conkey Agar but small, convex, smooth, translucent, non-hemolytic colonies were seen on Blood agar and Chocolate agar. Culture smear was prepared and gram staining was performed. Gram stain of the smear showed Gram negative cocobacillary forms. The growth was inoculated to Vitek 2 culture identification system. After 18-24 hrs, Vitek 2 reported the organism as *Brucella melitensis* from all the three blood samples. Antibiotics were changed to Doxycycline, Rifampicin and Moxifloxacin. He became afebrile after 6 days. He was transfused 2 units of PRBCs. Subsequently his renal parameters worsened, developed metabolic acidosis and hence was taken up for hemodialysis. During the hospital stay he was on regular twice a week hemodialysis. In view of persistently deranged renal parameters and USG abdomen showing evidence of medical renal disease, he was advised maintenance hemodialysis. He was planned for aortic valve replacement after 6 weeks of medical therapy. Patient opted for undergoing hemodialysis in the peripheral center. He was discharged in stable condition. After 7

weeks he was brought to ER with worsening breathlessness and hypotension. He developed cardiac arrest and could not be revived.

### Discussion:-

Brucellosis is still a serious health problem in developing countries. The incubation period is from 7 days to 3 months<sup>7,8</sup>, although incubation periods of as long as 10 months have been reported<sup>9</sup>. The infection usually manifests itself as a febrile syndrome with no apparent focus, chills, profuse sweating, asthenia, adynamia, malaise, arthralgia and myalgia<sup>11-16</sup>. Brucellosis can affect virtually any organ or system causing focal forms with long clinical courses, which are considered as true complications of the infections. Cardiac involvement is rare, occurring in 0% to 2% in large series<sup>11-18</sup>. Endocarditis is the most common cardiovascular complication. *Brucella* endocarditis produces highly destructive lesions of the valve structures<sup>19,20</sup>. Although a complete cure can be occasionally achieved with medical treatment alone<sup>22,23</sup>, most require surgical treatment because of hemodynamic instability<sup>19,20,22</sup>. Although overall mortality from brucellosis is low, endocarditis is a severe complication and accounts for about 80% of deaths<sup>24</sup>. The treatment for *Brucella* endocarditis has not been well established, due basically to the low number of reported cases. Most authors recommend a prolonged course of treatment<sup>25</sup>. Pericardial and myocardial involvement is relatively common in patients with *Brucella* endocarditis<sup>24,25</sup>, but can also happen as isolated events<sup>28</sup> in which case the prognosis is more favorable.<sup>26,28</sup>

### Conclusion:-

*Brucella* endocarditis remains a rare but serious complication of brucellosis. About half a million cases of brucellosis have been reported worldwide, though detection rate varies around 30-40% of actual incidence. Although *Brucella* endocarditis is a rare entity, it is associated with high mortality rates, hence high degree of clinical suspicion is essential, both in endemic as well as non-endemic areas.

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