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Is the Blood Culture Sufficient in the Diagnosis of İnfective Endocarditis

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Abstract

Infective endocarditis (IE) is a serious condition associated with the high risk of morbidity and mortality. Although positive blood cultures are a major diagnostic criteria for IE, blood culture negative endocarditis (BCNE) accounts for up to 35% of all cases IE. BCNE cases are major problem of diagnosis and management of endocarditis patients. Previous antibiotic usage, suboptimal blood culture taking techniques, prolonged incubation time are common causes of BCNE.

For diagnosis of BCNE detailed patient history and carefully interview to screen the potential contact with animals are necessary. After than a complete examination to detect any accessible infectious focus is screened. Studies performed so far have shown that blood culture is not sufficient in infectious endocarditis management. We suggest that should be taken into account molecular and serological methods together with the patient history at the management the blood culture negative endocarditis.

Keywords: *Haemoculture; İnfective Endocarditis*

Introduction

Infective endocarditis (IE) is a serious condition associated with the high risk of morbidity and mortality. Moreover it is still a great therapeutic challange due to difficulties in diagnosis [1,2]. The estimated incidence of IE is 1.5 to 6 cases per 100.000 person-years in Europe and the USA [1]. Although positive blood cultures are a major diagnostic criteria for IE, blood culture negative endocarditis (BCNE) accounts for up to 35% of all cases IE [2,3]. BCNE cases are major problem of diagnosis and management of endocarditis patients [4].

Previous antibiotic usage prior to blood culture collection and suboptimal blood culture taking techniques are the most common causes of BCNE(2). Infections due to fastidious microorganisms which need prolonged incubation time such as *Haemophilus* spp., *Actinobacillus actinomycetemcomitans*, *Cardio-bacterium hominis*, *Eikenella corrodens*, *Kingella* spp, *Candida* spp. and the intracellular organisms such as *Bartonella* spp., *Coxiella burnetti*, and *Tropheryma whippelei* are other causes of 'true' culture-negative endocarditis that cannot be routinely cultured in blood. They are often diagnosed by ad hoc serologic test and/or polymerase chain reaction (PCR) on excised cardiac valve tissue [2,5]. *C. burnetii* is a zoonotic infection which is first defined in slaughterhouse workers in Australia at 1936, causes Q fever and endocarditis which has been reported as the most common clinical picture of chronic Q fever [6].

In the study of Boudebouch., *et al*. examination of 19 culture negative patients with PCR, Western blot test, immunoassay methods were resulted by detection of *Coxiella burnetii, Bartonella quintana, B. henselae, Legionella pneumophila, Brucella melitensis, Mycoplasma pneumoniae, Bartonella, Staphylococcus aureus, Streptococcus equi*, and *Streptococcus oralis* in their study group [4].

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Previous studies have demonstrated the role of *C. burnetii*, but they could find no study that directly detected *Bartonella* in BCNE [4] On the other hand Bekir Çelebi., *et al*. [6]. demonstrated that the isolation and identification of *C. burnetii* by cell culture, molecular and serological methods from the heart valve of a patient with endocarditis and phase I and phase II variants by use the phase method.

In patients with BCNE with risk factors for *Bartonella* (contact with cats), is recommended as a standard screening test [5]. Molecular analysis of valve tissues using real time PCR is also a contributive test for confirmation when early valve surgery is carried out [5].

Another cause of BCNE is *Tropheryma whipplei.* Whipple's disease is caused by *Tropheryma whipplei* and causes a self-limiting gastrointestinal infection. The majority of the population is an asymptomatic carrier, however, in some patients, it causes an invasive infection such as endocarditis [7,8].

Conclusion

The automated IFA InoDiag multiplexed antigenic microarray test is a valuable tool for the rapid diagnosis of BCNE such as *Coxiella burnetii*, *Bartonella* spp., *Brucella melitensis* and *Legionella pneumophila* [9-11]. For diagnosis of BCNE detailed patient history and carefully interview to screen the potential contact with animals are necessary. After than a complete examination to detect any accessible infectious focus is screened. Studies performed so far have shown that blood culture is not sufficient in infectious endocarditis management. It is important to carry out a PCR for diagnosis in heart valves removed [12,13]. We suggest that the factors we try to count above in blood culture negative endocarditis should be taken into account together with the patient history.

Bibliography

1. Angsutararux T and Angkasekwinai N. "Cumulative incidence and mortality of infective endocarditis in Siriraj hospital-Thailand: a 10-year retrospective study". *BMC Infection Disease* 19.1 (2019): 1062.
2. Subedi S., *et al*. "Laboratory approach to the diagnosis of culture-negative infective endocarditis". *Heart, Lung and Circulation* 26.8 (2017): 763-771.
3. Baddour LM., *et al*. "Infective Endocarditis in Adults: Diagnosis, Antimicrobial Therapy, and Management of Complications: A Scientific Statement for Healthcare Professionals From the American Heart Association". *Circulation* 132.15 (2015): 1435-1486.
4. Boudebouch N., *et al*. "Blood Culture-Negative Endocarditis, Morocco". *Emergency Infection Disease* 23.11 (2017): 1908-1909.
5. Ebota M. "Editorial Bartonella species: Important cause of culture negative endocarditis". *Journal of Cardiology Cases* 13 (2016): 4-5.
6. Çelebi B., *et al*. "First Isolation of Coxiella burnetii in Turkey from a Patient with Endocarditis Antigen Production and Phase Change Study". *Mikrobiyoloji Bülteni* 53.3 (2019): 274-284.
7. McGee M., *et al*. "Tropheryma whipplei Endocarditis: Case Presentation and Review of the Literature". *Open Forum Infectious Diseases* 6.1 (2018): ofy330.
8. Scheurwater MA., *et al*. "Whipple's endocarditis: a case report of a blood culture-negative endocarditis". *European Heart Journal Case Report* 3.4 (2019): 1-6.
9. Jang YR., *et al*. "Molecular detection of Coxiella burnetii in heart valve tissue from patients with culture-negative infective endocarditis". *Medicine* 97.34 (2018): e11881.
10. Gouriet F., *et al*. "Multiplexed whole bacterial antigen microarray, a new format for the automation of serodiagnosis: the culture-negative endocarditis paradigm". *Clinical Microbiology Infection* 14.12 (2008): 1112-1118.

Citation: Dr. Neşe İnan and Dr. Haci Kemal Erdemli. "Is the Blood Culture Sufficient in the Diagnosis of İnfective Endocarditis". EC Cardiology SI.02 (2020): 01-03.

11. Kim MS., *et al*. "Utility of a Direct 16S rDNA PCR and Sequencing for Etiological Diagnosis of Infective Endocarditis". *Annals of Laboratory Medicine* 37.6 (2017): 505-510.

12. Melenotte C., *et al*. "Blood Culture-Negative Cardiovascular Infection in a Patient With Multiple Sclerosis". *Open Forum Infectious Diseases* 6.10 (2019): ofz429.

13. Okaro U., *et al*. "Bartonella Species, an Emerging Cause of Blood-Culture-Negative Endocarditis". *Clinical Microbiology Review* 30.3 (2017): 709-746.

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