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Impact of serology and molecular methods on improving the microbiologic diagnosis of infective endocarditis in Egypt

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Abstract

Background

Conventional diagnosis of infective endocarditis (IE) is based mainly on culture-dependent methods that may fail because of antibiotic therapy or fastidious microorganisms.

Objectives

We aimed to evaluate the added values of serological and molecular methods for diagnosis of infective endocarditis.

Patients and methods

One hundred and fifty-six cases of suspected endocarditis were enrolled in the study. For each patient, three sets of blood culture were withdrawn and serum sample was collected for *Brucella*, *Bartonella* and *Coxiella burnetii* antibody testing. Galactomannan antigen was added if fungal endocarditis was suspected. Broad range PCR targeting bacterial and fungal pathogens were done on blood culture bottles followed by sequencing. Culture and molecular studies were done on excised valve tissue when available.

Results

One hundred and thirty-two cases were diagnosed as definite IE. Causative organisms were detected by blood cultures in 40 (30.3 %) of cases. Blood culture-negative endocarditis (BCNE) represented 69.7 %. Of these cases, PCR followed by sequencing on blood and valvular tissue could diagnose five cases of *Aspergillus flavus*. Eleven patients with BCNE (8.3 %) were diagnosed as zoonotic endocarditis by serology and PCR including five cases of *Brucella* spp, four cases of *Bartonella* spp and two cases of *Coxiella burnetii*. PCR detected three cases of *Brucella* spp and two cases of *Bartonella* spp, while cases of *Coxiella burnetii* were PCR negative. The results of all diagnostic tools decreased the percentage of non-identified cases of BCNE from 69.7 to 49.2 %.

Conclusion

Our data underline the role of serologic and molecular tools for the diagnosis of blood culture-negative endocarditis.