

Echocardiography in diagnosis and management of infective endocarditis

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Editorial

Echocardiography is unavoidable method in diagnosis and management of infective endocarditis. In 1973 American Heart Journal published a paper evaluating echocardiographic characteristics of mitral and aortic valve vegetations.¹ At the time, one-dimensional image echocardiography (1D) was used in diagnosis of infective endocarditis. In the last 40 years, there has been major improvement of technology and development of echocardiographic procedures. Today, besides one-dimensional image (1D), we can use two-dimensional (2D), three-dimensional (3D) or four-dimensional image (4D) echocardiography. Technological development has led to increased diagnostic capabilities of echocardiography and its broad use in routine every day clinical practice. In the evaluation of infective endocarditis echocardiography can detect vegetations on heart valves, cusps rupture or perforation and perivalvular inflammatory process spreading. According to the Duke criteria echocardiographic finding is one of the main criteria for diagnosis of endocarditis. The positive echocardiographic findings include: vegetations, abscess, new onset of artificial valve dehiscence and new onset of valvular regurgitation.² We use echocardiography to detect changes of cardiac valves and to evaluate systolic and diastolic heart function. Vegetations can be found on native or artificial valves and on the pacemaker or implantable cardioverter-defibrillator (ICD) leads. Vegetations are detected in 42-86% of patients with IE by applying echocardiography. The comparison of the results between transoesophageal echocardiography (TOE) and transthoracic echocardiography (TTE) in the detection of vegetations shows better sensitivity of TOE (85-90%) than the sensitivity of TTE (60%). Specificity of TTE is 67%, and specificity of TOE is around 91-98%. 3D and 4D TOE have been used more commonly in the diagnostics in the last ten years. The sensitivity of this new methods in diagnosis of infective endocarditis is similar to 2D TOE, while its specificity is much higher (100%). However, sensitivity of TTE is much lower in detecting vegetations in patients with artificial valves, implanted pacemaker or implantable cardioverter-defibrillator. We can use the echocardiography to determine size, echogenicity and mobility of vegetation. Based on this indicators it is possible to make a decision about surgical treatment, estimate the risk of embolic event and predict the clinical outcome.³ The patients with vegetations that larger than 1,0 cm in diameter have significantly higher risk of embolic event (36%) than the patients with vegetations smaller than 1,0 cm (6%). According to the new Guidelines of European Society of Cardiology (ESC) for the management of infective endocarditis, it is important to perform TTE in each patient with suspicion of infective endocarditis. In all patients with artificial heart valve, pacemaker or cardioverter- defibrillator, it is indicated to perform TOE.⁵⁻⁷ Further more, in cases of negative TTE in patients with high clinical suspicion of endocarditis, it is advisable to perform TOE as well.⁴ About 15 % of patients with endocarditis have normal echocardiographic finding. Echocardiography may not detect vegetations in too early stage of

disease or in case when vegetation caused an embolic event.⁸ In some cases we may not detect vegetations due to significant preexistent lesions on valves, such as mitral valve prolapse, degenerative process or due to acoustic shadows and reverberations caused by artificial valves. In case echocardiography assesment was made in very early stages of disease with negative examination but with high clinical suspicion of infective endocarditis, it is indicated to repeat the TTE and/or TOE within 5-7 days.

Conclusion

Early diagnosis, prompt and efficient therapy and detecting and dealing with the complications are the most important factors in achieving good outcome in endocarditis treatment. Echocardiography has important role in diagnosis of endocarditis, detection of complications, decision making regarding the surgical treatment and patients follow-up with great prognostic significance remarkably contributing to better outcome.

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Conflicts of interest

The authors declare there is no conflict of interests.

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