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Antithrombotic therapy in valvular heart disease and artificial valves

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ABSTRACT

The article summarizes the current recommendations and knowledge for the treatment of patients with artificial valves. The attention is focused on antithrombotic therapy after valve replacement, including possible complications of the treatment, particularly thromboembolic and bleeding complications. We review the procedures when the anticoagulation must be interrupted. The possibilities of improving therapy in patients that require permanent anticoagulation and the outlook for the future are discussed.

Contents

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1. Introduction

More than 100 million patients around the world suffer from valvular heart disease, as the incidence of degenerative valvular heart disease increases with age. At the present time, each year approximately 300,000 valves are implanted, and a further increase is expected. In addition, new less invasive procedures, percutaneous aortic valve implantation—TAVI and edge to edge mitral repair—Mitra Clip are also being used.

Czech guidelines were published in 2007 and they are mainly based on the 2007 European Society of Cardiology (ESC) guidelines and the AHA/ACC guidelines published in 2006. Recently, new guidelines were published by the European Society of Cardiology as well by the American College of Chest Physicians (ACCP), which include new knowledge regarding antithrombotic therapy [1–5].

The current guidelines are in agreement in essential areas, but there are some points in which the European and American guidelines differ. This is because the recommendations are primarily based on retrospective and observational trials, as prospective randomized trials are missing. At the present time, there is much progress in cardiology in terms of new antithrombotic agents. Many questions therefore emerge:

1. How to manage antithrombotic therapy in patients with valvular disease and in patients with artificial valves?
2. What situations require dual antithrombotic therapy?
3. How to manage complications during antithrombotic therapy and in case of requirement for discontinuation of anticoagulation therapy?
4. How to manage patients with artificial valves during pregnancy?
5. Is there any place for new antithrombotics in the treatment of valvular heart disease?
6. Is it possible to improve therapy in patients who require permanent anticoagulation therapy?

2. Antithrombotic therapy in patients with valvular disease and with artificial valves

2.1. *Oral anticoagulation therapy with warfarin*

1. In patients with native diseased valves
   (a) always when atrial fibrillation is present
   (b) specific situations arise in patients with mitral stenosis, where anticoagulation therapy is indicated in the presence of atrial fibrillation (paroxysmal, persistent or permanent), further in patients with thromboembolic complications during sinus rhythm, and if a thrombus is present in the left atrium. It should be considered in patients with a severe mitral stenosis, who have sinus rhythm but significantly dilated left atrium.
2. In patients with artificial valves or valve repair:

The individual risk of thromboembolism should be determined individually before antithrombotic therapy is initiated. This is based on what type or surgery was performed—valve replacement or repair, what type of prosthesis was used (mechanical, biological, homograft, autograft), another important factor is the location of the prosthesis (mitral, aortic, tricuspid, pulmonal) [6].

There are no data from randomized trials for initial anticoagulation treatment, therefore the regimes vary. Based on observational trials, most of the embolization events occurred early after the surgery. It is therefore recommended to initiate anticoagulation as soon as possible after the surgery, as soon as the risk of bleeding decreases. Warfarin therapy is initiated 6–24 h after the operation. Unfractionated heparin or low molecular weight heparin with monitoring of aPTT and antiXa is administered simultaneously. Low molecular weight heparin is not recommended in obese patients and in patients with renal failure [7,8].

(A) Permanent anticoagulation therapy is indicated in patients with mechanical prosthesis regardless the type of prosthesis or the time of implantation. The target INR range must take into account the individual patient risk factors and the thrombogenicity of the valve (Table 1) Conventional categorization of individual types of prosthesis differ between the European and American guidelines, on top of it the American guidelines recommend the use of warfarin with a low dose of ASA in all patients with mechanical prosthesis, as the risk of thromboembolic complications and overall mortality decreases, however there is an increase in bleeding complications. Therefore this combination is recommended in the European as well as in our guidelines in only targeted patients with an increased risk of thromboembolism [1–5].

(B) Permanent anticoagulation therapy in patients with biological valves, after valve repair, or homografts is indicated if the patient has another indication for chronic anticoagulation, i.e. atrial fibrillation, left ventricular dysfunction with ejection fraction of less than 30%.

(C) The first 2–3 months after the implantation of a biological prosthesis in mitral position and after mitral valve repair with the annuloplastic ring. According to the 2007 Czech guidelines, a 3-month antiaggregation as well as a 3-month anticoagulation therapy can be used in the case of aortic bioprosthesis. (The ACTION and ANSWER trials are currently investigating whether antiaggregation therapy is sufficient) [9].

(D) 6 months after MAZE procedures, the therapy is prolonged if atrial fibrillation persists.