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## Full Length Review Article

### INFECTIVE ENDOCARDITIS: A BRIEF OVERVIEW

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#### ABSTRACT

Bacterial endocarditis is a serious infection of the heart valves caused mainly by *Staphylococcus aureus* and *Streptococcus viridans*. The objective of this study was to conduct a literature review of the main guidelines for the AHA and work related to bacterial resistance and the applicability of these standards in clinical cases. It was infective endocarditis. Concluded that, although relatively uncommon, is a disease que causes substantial morbidity and mortality. Although the advances in diagnosis and treatment have improved antimicrobial, prevention is still an important factor.

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#### INTRODUCTION

Although initially established to define more precisely the cases of IE (Infective Endocarditis) for epidemiological and clinical studies, the Duke criteria have been widely used over the last decade to help physicians in the diagnosis of IE. The two main components of the criteria are persistent bacteremia arising from typical bacteria IE (*Staphylococcus aureus* and *Streptococcus viridans* by) and evidence of heart valve involvement, such as infection, abscess paravalvular regurgitation or (AHA, 2014; Williams *et al.*, 1953; Popescu *et al.*, 2005). Signs of risk for IE includes fever, in addition to increased risk for patients with vascular disease, immune compromised and intermittent bacterial or fungal infections (AHA, 2014). Based on a concrete diagnosis antibiotic treatment is carried out in a rational manner, while the diagnosis based only on epidemiological data of certain agents responsible for certain infections. The unnecessary and excessive use of antibiotics promotes the development of bacterial resistance resulting in a serious problem in the treatment of infectious diseases.

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The Endocarditis can be bacterial or fungal, being the most rare fungal endocarditis, most with high mortality rate. Bacterial endocarditis is a serious infection of the heart valves primarily caused by *Staphylococcus aureus* and by *Streptococcus viridans*. *A. viridans* is not common bacterial agent in the population, and endocarditis caused by this agent is rare (Williams *et al.*, 1953). This pathogen has also been linked to meningitis, bacteremia, urinary tract infection and septic arthritis (Popescu *et al.*, 2005). *A. viridans* is generally sensitive to penicillin, sulfamethoxazole-trimethoprim and glycopeptides (Takayama *et al.*, 2010; Rasmussem, 2013).

EI remains a serious and deadly complication in patients at risk because it causes valvular destruction and congestive heart failure, although not a frequent event. (Fiolet, 2010) Today, the strains of *Staphylococcus aureus* are held responsible for the higher incidence of infective endocarditis, followed by *Streptococcus viridans* comprising four phylogenetic groups: *mitis*, *S. mutans*, *salivarius* and *anginosus* group or *milleri*. Some of these bacteria are implicated in oral diseases as caries and periodontitis, which are the most common bacterial infections.

The main bacterial species associated with the development of caries (cariogenic bacteria) are *Streptococcus mutans* and

*Lactobacillus spp.* There are about 100 species of *Lactobacillus* and some of these species live in various parts of our body, for example, the gastrointestinal and female urogenital tract Both *Lactobacillus*, as *S. mutans*, cariogenic exhibit certain characteristics with high acidic potential gene. The aim of this study was to conduct a literature review of the main guidelines by the American Heart Association - AHA and work related to bacterial resistance and the applicability of these standards in clinical cases.

## Literature review

### Treatment with antibacterial

Dentistry has played an important role in the detection and prevention of systemic diseases, since many diseases can be caused or oral repercussion. In this practice, significant complications can be prevented or minimized in the appropriate care of patients at risk for endocarditis. In the literature, there is controversy about the occurrence of endocarditis or not originating from dental treatments, or even of antibiotic prophylaxis efficiency in prevention of this disease, however, in spite of these uncertainties, as a preventive measure the American Heart Association (AHA) provides prophylactic protocol for risk patients, which has been followed for the care of these (Cavezzi and Zanatto, 2003; Farbord *et al.*, 2009; Gutierrez *et al.*, 2004).

The three generations infective endocarditis was already inevitable. Studies made possible the improved treatment of the disease with tests, especially echocardiography, even with infectious process in activity, and recommendations antibiotic preoperatively. Today is treatable infectious endocarditis (Grinberg, 2011). Antibiotics is of great importance in clinical performance, it is necessary to know the dosage of the medicine and ways to use (Lira, 2001). Prophylaxis of endocarditis has been widely (Grinberg, 1997; Harbarth, 2000; Cabell *et al.*, 2003). In test and after the incubation period, the reading is performed based on the specific chromogenic biochemical reactions and after incubation the Minimum Inhibitory Concentration Reading is performed from the point where it begins inhibiting bacterial growth (Konemam *et al.*, 2001).

According to work done previously and the guidelines of the AHA there is only need for antibiotic prescription in dentistry in invasive procedures in which involves bleeding and patients with underlying diseases already installed or in use of cardiac valvular prostheses, although endocarditis is not common cases reported show that this condition is severe it may result in morbidity and mortality of patients (Dajani *et al.*, 1997). For dental procedures involving risks to patients in whom prophylaxis is recommended, the regime has been considered as single dose of 2g. (or 50 mg / kg in children) of amoxicillin, an additional dose is not necessary. Erythromycin started to not be recommended as an alternative in patients allergic to penicillin, but is Clindamycin (Dajani *et al.*, 1997; Taubert *et al.*, 1998). The first records of bacterial resistance of cases was in the 1940s, but is still a current problem and of such importance (WHO, 2012).

Bacterial resistance has been considered a growing problem worldwide public health and the biggest obstacle to the

success of a treatment, as it continues to reduce the number of valid antibiotics available. The resistance on previously susceptible organisms occurs when using antibiotics in human or animal infections. The antimicrobial agent alone does not induce resistance, but to the inappropriate use of a selective pressure occurs more resistant strains among a population. The natural selection of resistant strains has created a competition between technology and microbial evolution. With the rampant use of antimicrobial agents, for decades, the resistance appears in viruses, bacteria, fungi and protozoa, leading to new challenges both for individual treatment and for control programs (WHO, 2012).

However, in immunosuppressed patients, *Staphylococcus aureus* presence can promote the occurrence of infection (Gelatti *et al.*, 2009). In general these microorganisms are aggregates of skin and soft tissue infections and may also cause severe and even fatal disease (Skov and Jensen, 2009). While 37.2% of people have gram-positive cocci in their nasal mucosa infections caused by *S. aureus* small complications may arise, such as osteomyelitis, endocarditis and pneumonia (Matouskova and Janout, 2009). Thus, to evaluate bacterial resistance against the antimicrobial possible bacterin risk patients with endocarditis is particularly important because even microorganisms. The irrational use of antimicrobial determined the emergence of multiresistant microorganisms, which boosted the scientific community researching in the fields of chemistry, pharmacology and microbiology for discovery of new antibiotics (Cechinel-Filho, 2010).

### Various etiologies

The IE has multiple etiologies, and may be from an invasive dental treatment since the deployment of cardiac prostheses, and invasive medical procedures in patients with underlying diseases already installed, such as autoimmune diseases, heart disease and frequent use of antibiotics. Other cardiovascular complications are very prevalent, such as congestive heart failure (20% of patients referred for dialysis have this diagnosis), acute coronary syndrome, heart valve disease (mitral calcification, esclerosoartics, accelerating the degeneration of the bioprosthesis, predisposition to bacterina endocarditis) and arrhythmias (AHA, 2014).

Clinically, patients present a suggestive clinical picture: fever, heart murmur appearance, anemia, splenomegaly, petechiae in the skin, conjunctiva, mucous membranes and vasculitis. ASA I patients the manifestation of IE because of its stabilized systemic health picture is not frequent. Antibiotic prophylaxis in dentistry and recommended in patients with underlying heart disease, when it is involved manipulation of tissues, coronary access AHA seconds (AHA, 2014). Thus, IE has been 100% fatal for our great-grandparents. Research and clinical observations and motivated by concern and collaboration were essential to progress therapeutic diagnostics in the second half of the twentieth century who gave evidence on the pathogenesis in previous centuries (Grinberg, 2011). Infective endocarditis is a serious heart disease, that a life-threatening according to the cited authors: Araújo, 2002 (Araújo and Figueiredo, 2002); Sampaio *et al.*, 2008 (Sampaio *et al.*, 2008). Its development can be related to bacteremia arising from dental procedures [25].

## Conclusion

It was concluded that infective endocarditis, although relatively uncommon, is a disease that causes substantial morbidity and mortality. Although the advances in diagnosis and treatment have improved antimicrobial, prevention is still an important factor. Protocols to the use of prophylactic antibiotics have been used in medical and dental procedures likely to generate development of the disease in high-risk patients.

## Competing interests

The authors declare que they have no competing interests.

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