

ANTIBIOTIC PROPHYLAXIS AND DENTAL TREATMENT

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Abstract. The promotion of health and the well-being of the patient is one of the main goals of health professionals. In certain common dental procedures, it can cause transient bacteremia, significantly increasing the risk of developing an infectious process. Antibiotic prophylaxis is assumed as a preventive measure, providing concentrations of the antibiotic in the blood, in order to prevent bacterial proliferation and dissemination. Antibiotic prophylaxis is used for two different purposes: to prevent infections at the surgical site, and infections at a distance. Thus, the aim of this article is to review the literature on the use of antibiotic prophylaxis during dental treatment. With protocols already established for antibiotic prophylaxis in patients with a predisposition to endocarditis and immunosuppressed patients according to the type of procedure performed, since the indications depend on specific factors and must be analyzed individually, given that if administered correctly, it denotes efficacy against to possible postoperative complications.

Keywords. Antibiotic prophylaxis, Dental treatment, Dentistry.

INTRODUCTION

Antibiotic prophylaxis began in 1955 when the American Heart Association (AHA) observed and included in its guidelines that carrying out invasive procedures caused distant infection, resulting in a phenomenon identified as bacteremia, which is the exacerbation of the presence of bacteria in the bloodstream and It is indicated in situations where a bacterial infection, whether of odontogenic origin or not, is present in the body (2).

Bacteremia of oral origin can arise from untreated oral infections, from some routine daily activities such as tooth brushing. Antibiotic prophylaxis is intended to prevent distant infections in: invasive procedures with tissue manipulation (1).

The systemic clinical signs associated with the most common oral infections, such as fever and regional lymphadenopathy, are important markers for prescribing antibiotics, to help reduce the bacterial load through their bactericidal or bacteriostatic action, so that the disease will only be eliminated with removing the source of infection, making it necessary to consider surgical risk factors and the patient's individual circumstances (3).

The inappropriate use of antibiotics is capable of leading to the evolution of bacterial resistance, hence the interest in the rational use of this therapeutic resource based on clinical criteria and scientific evidence. The indication of the antibiotic prophylaxis regimen to be prescribed must judge pre-existing health conditions and individual aspects. In 1997, the AHA published its first recommendations for the prevention of Infectious Endocarditis (IE), in 2007 there was an advance in the protocol establishing which dental procedures and cardiac conditions should receive antibiotic prophylaxis, in 2017 new guidelines restricted antibiotic prescription for the prevention of IE to certain procedures and specific groups of patients with diseases (6).

Therefore, the objective of this article is to carry out a literature review on the use of antibiotic prophylaxis during dental treatment.

LITERATURE REVIEW

Defined as the standard of care for more than 50 years in the United States, the AHA defined antibiotic prophylaxis as the administration of antibiotics prior to surgery with the aim of preventing infection, declaring that tooth extractions and manipulation of gingival tissues were the procedures of dentistry.

best suited for prescribing antibiotic prophylaxis, since these procedures caused transient bacteremia (7).

The oral cavity is a niche for microbial colonization and a potential entry point for infectious agents into the gastrointestinal tract and bloodstream. The oral cavity is one of the main habitats in the human body for commensal microbial colonization and the first place of microbial encounter before entering the gastrointestinal tract (10).

The oral cavity is made up of more than 400 types of bacterial species, including aerobic and anaerobic, establishing a harmonious relationship in the oral environment, understanding the intimate association between bacteremia and dental procedures. Most infections that occur in the oral cavity are opportunistic, and antimicrobials that act on the microorganisms most commonly found in the oral cavity, such as streptococcus, aerobic and anaerobic staphylococcus, spirochetes and bacteroids, must be used (4).

Microbial translocation of oral microbes is reported after chewing and during dental procedures due to breach of the local epithelial barrier. However, this microbial translocation is transient and is not considered a risk factor for distal infections in the presence of oral health. Still, in the presence of ongoing odontogenic infections, microbial translocation from the oral cavity has been considered a risk factor for distal infections, particularly during invasive dental procedures (5).

Invasive dental procedures are those with the highest incidence of bacteremia (ranging from 13% to 96%), the incidence depends on the time interval between the procedure and sample collection. It has been demonstrated that the incidence and duration of bacteremia are influenced by the presence mainly of odontogenic infections (5).

Antibiotic prophylaxis is based on the application of antibiotics to patients who do not have an infection with the aim of preventing the multiplication of bacteria, with two objectives: to avoid contamination in the area that will be exposed after surgery and to prevent contamination from a distance (4).

The indication of antibiotic prophylaxis is for all dental procedures that involve manipulation of gingival tissue or the periapical region of the teeth, perforation of the oral mucosa, in patients who present the following conditions: cardiac (patients with prosthetic heart valves or repaired with prosthetic material, history previous endocarditis, heart transplant that evolves with valve dysfunction, uncorrected or corrected cyanotic congenital heart disease, but which evolved into residual lesion), systemic (patient with acquired immunodeficiency syndrome-AIDS (with $CD4 < 1,000/mm^3$), chemotherapy treatments, solid organ or bone marrow transplants, undergoing head and neck radiotherapy treatments, using immunosuppressants, autoimmune disease, sickle

cell anemia, splenectomy, using bisphosphonates, injecting drug users, chronic kidney disease, severe facial infections (infections that extend to the deep cervical spaces), chronic or active hepatitis, diabetes mellitus (moderate risk patients: glycated hemoglobin between 7 and 9% and fasting blood glucose between 200 and 250 mg/dL and high risk: glycated hemoglobin above 9% and fasting blood glucose above 250 mg/dL), patients with orthopedic joint prostheses (when the patient has the following risk factors: immunosuppressed, HIV infection, inflammatory arthropathy (rheumatoid arthritis, systemic lupus erythematosus), diabetes, malnutrition, hemophilia, recent prosthesis placement (< 2 years), history of previous orthopedic prosthesis infection) (1).

Current evidence demonstrates that there is no indication of antibiotic prophylaxis for the general population, and it is also not recommended in the following conditions: presence of atrial septal defect, surgical correction of atrial or ventricular septal defect or patients with patent ductus arteriosus (without residue after six months), myocardial revascularization surgery, mitral valve prolapse with or without regurgitation and/or leaflet thickening, previous Kawasaki disease (without valve dysfunction), history of rheumatic fever, intravascular cardiac pacemaker, implanted defibrillator and hydrocephalus (1).

In 1955, the AHA recommended that a better way to protect a patient from bacteremia during an invasive dental procedure would be through the administration of antibiotics, that is, antibiotic prophylaxis (8).

The medicines of choice must have bactericidal potential against bacteria commonly observed in the oral cavity, and must remain at their maximum concentration in the blood during the period of care. Current recommendations from the American Heart Association (AHA) from 2017 indicate amoxicillin in a single dose of 2g orally, one hour before the procedure. This medication is the first choice because it is better absorbed by the gastrointestinal tract and provides higher serum concentrations for a longer period. In patients allergic to penicillin, oral clindamycin (600mg) or cephalexin (2g) or azithromycin or clarithromycin (500mg) are recommended one hour before the procedure (2).

The indiscriminate and erroneous use of antibiotics has become a universal health setback, leading to the emergence of resistant bacteria. This may have implications for the dental clinic as there may be a decrease in the effectiveness of antibiotics for the treatment of oral bacterial infections (9).

DISCUSSION

For Cangussu, 2015 (3), the divergences between international guidelines regarding antibiotic prophylaxis (AP) are a reason for constant discussion among the scientific community regarding the best

conduct to be adopted, in addition, the various studies carried out prove that the burden of Bacteremia developed in everyday activities such as brushing teeth and using dental floss can pose a much greater risk in inducing the disease than invasive dental procedures, due to their virulence and the constancy with which the activities are carried out.

According to Orlando, 2011 (10) and Pant S et al, 2015 (4), the oral cavity is a niche for microbial colonization and a potential entry point for infectious agents into the gastrointestinal tract and bloodstream. The oral cavity is one of the main habitats of the human body for commensal microbial colonization and the first microbial meeting place before entering the gastrointestinal tract, composed of more than 400 types of bacterial species between aerobic and anaerobic, establishing a harmonious relationship in the oral environment, understanding the intimate association between bacteremia and dental procedures.

Moreira et al, 2023 (2) reports that the current recommendations of the American Heart Association (AHA) from 2017 indicate amoxicillin in a single dose of 2g orally, one hour before the procedure. This medication is the first choice because it is better absorbed by the gastrointestinal tract and provides higher serum concentrations for a longer period. In patients allergic to penicillin, oral clindamycin (600mg) or cephalexin (2g) or azithromycin or clarithromycin (500mg) are recommended one hour before the procedure.

CONCLUSION

It is essential to advance more studies and research on human beings so that a more coherent and standard protocol becomes legitimate, based on consistent evidence so that there are no antagonistic and controversial protocol lines, and the choice of medication to the patient, taking into account bacterial resistance and costs for the population and public health.

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