Infective Endocarditis Prophylaxis for Dental Procedures : An Overview

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Abstract

Dental treatment and procedures are most widely accepted as factors predisposing infective endocarditis. However most cases of infective endocarditis are not preceded by dental procedures within 3 months before endocarditis. Antibiotic prophylaxis, if 100% effective, likely prevents only a small number of cases of endocarditis. Frequency and magnitude of bacteremia associated with dental procures and routine daily activities like tooth brushing and flossing are similar. In view of this, American Heart Association has recommended antibiotic prophylaxis only patients with high risk cardiac lesions, in conjunction with dental procedures wherein there is manipulation of gingival tissue, periapical region of teeth or perforation of oral mucosa. Maintaining good dental hygiene is also advised.

Introduction: Infective Endocarditis

Infective endocarditis, a serious infection of the endocardium of the heart, particularly the heart valves, is associated with a high egree of illness and death. It generally occurs in patients with altered and abnormal heart architecture, in combination with exposure to bacteria through trauma and other potentially high-risk activities involving transient bacteremia. The risk of infection of heart valves in persons predisposed to acquiring infective endocarditis increases with the following conditions: congenital heart disease, rheumatic fever, major dental treatment, open heart surgery, and genitourinary procedures. New evidence is growing that changes in social behavior, such as an increase in the incidence of body piercing, excessive alcohol consumption, and the use of intravenous self-administered illicit drugs may also predispose a susceptible person to an increased risk of acquiring endocarditis. A combination of events must occur to cause infective endocarditis. First, injury to the endocardial surface induces focal adherence of platelets and fibrin. Then, a bacteremic event seeds this aggregate with microorganisms, attracting more platelets and fibrin, allowing uninhibited microbial growth and the development of an inflammatory plaque or vegetation. The patient may exhibit any of the following signs and symptoms: fatigue and weakness; weight loss; fever and chills; night sweats; heart murmur; aches and pains; painful nodes in the pads of fingers and toes; red spots on skin of palms and soles; nail abnormalities; swelling of feet, legs, and abdomen; shortness of breath with activity; and blood in the urine. A medical history, physical examination, and echocardiogram are usually performed. Blood samples are usually taken, and the physical and biochemical properties of the blood are investigated. Endocarditis is usually curable provided an early diagnosis is made, and the patient receives the appropriate antimicrobial treatment; the time needed for recovery is approximately 68 weeks. The patient generally requires long-term antimicrobial drugs (46 weeks), hospitalization, and in some cases, valve replacement. A number of complications may be associated with the disease such as blood clots, stroke, heart rhythm problems, abscesses, and other infections.

Role of Antibiotic Prophylaxis

Although prophylaxis has been a standard practice for years, its efficacy and cost-effectiveness have never been proven. A sequential relationship between dental procedures and infective endocarditis have been demonstrated in only 4% to 7.5% of cases. Most cases of infective endocarditis are not preceded by dental procedures within 3 months preceding endocarditis.

Furthermore, the data are limited and insufficient to substantiate the efficacy of antibiotics in preventing endocarditis in patients with high-risk cardiac conditions who undergo dental procedures. Failures have occurred even when the infecting microorganism was susceptible to the antibiotic given for prophylaxis. Since bacteremia occurs also during brushing and flossing of teeth, why give prophylaxis just for dental procedures? Moreover, the risks of causing adverse or anaphylactic reactions from antibiotics, as well as contributing to the nationwide antibiotic resistance problem, are issues not to be taken lightly.

Poor compliance with prophylaxis has been documented. Studies have shown that practitioners adhere to recommended dental prophylaxis programs only about 40% of the time, while only 22% of patients with predisposing cardiac conditions could recall taking their prescribed prophylactic antibiotics before an indicated procedure, as recommended.

Antibiotic prophylactic regimens

A. Standard oral regimen:

1. Amoxicillin 2 g PO 1 h before procedure.

B. Inability to take oral medication:

1. Ampicillin 2 g IV or IM within 1 h before procedure.

C. Penicillin allergy:

1. Clarithromycin or azithromycin 500mg PO 1 h before procedure
2. Cephalexin 2 g PO 1 h before procedure
3. Clindamycin 600 mg PO 1 h before procedure

D. Penicillin allergy, inability to take oral medication:

1. Cefazolin or ceftriaxone 1 g IV or IM 30 min before procedure
2. Clindamycin 600 mg IV or IM 1 h before procedure

High risk cardiac lesions for which Endocarditis Prophylaxis is recommended

- Prosthetic heart valves
- Prior endocarditis
- Unrepaired congenital cyanotic heart diseases.
- Completely repaired congenital heart defects during the 06 months after repair .
- Incompletely repaired congenital heart diseases with residual defects adjacent to prosthetic material.
- Valvulopathy developing after cardiac transplantation.

Conclusion

Antibiotic prophylaxis has been recommended only for patients with high risk cardiac lesions, in conjunction with dental procedures wherein there is manipulation of gingival tissue, periapical region of teeth or perforation of oral mucosa The major changes in the updated recommendations include the following: (1) The Expert Committee of American Heart Association concluded that only an extremely small number of cases of infective endocarditis might be prevented by antibiotic prophylaxis for dental procedures even if such prophylactic therapy were 100% effective. (2) Infective endocarditis prophylaxis for dental procedures is reasonable only for patients with underlying cardiac conditions associated with the highest risk of adverse outcome from infective endocarditis. (3) For patients with these underlying cardiac conditions, prophylaxis is reasonable for all dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa.

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