Abstract: Infective endocarditis is a serious infection occurring on the endothelial surfaces of the heart, especially at the valves. Oral commensal bacteria are the important etiologic agents in this disease. Common dental procedures, even non-surgical dental procedures, can often cause bacteremia of oral commensals. Periodontally diseased patients are at risk from bacteremia even after brushing the teeth. Bacteremia itself rarely affect healthy people but they can result in mortal infective endocarditis in those who have a predisposed risk for this disease, such as those with heart valve diseases, pacemaker implantation, etc. Infective endocarditis is thus established when all the 3 conditions are present simultaneously, i.e., 1) a predisposing impairments in the heart, 2) the introduction of bacteria into the bloodstream, and 3) the virulence of bacteria. Antibiotics have to be adequately used to prevent this infection, however, their frequent uses generates drug-resistant mutant bacteria, which is a serious social problem. The development of novel alternative drugs to be used instead of the current antibiotics is thus highly desired. We are now using several types of combinatorial peptide libraries to search for small size molecular mimetics that can interfere with the adhesion of bacteria to the target organ. The use of such peptides is expected to lead to the development of compounds for a novel preventive drug which does not kill bacteria, thus making it safer and less likely to generate drug-resistant mutants. J. Med. Invest. 53: 189-198, August, 2006

Keywords: infective endocarditis, dental procedures, oral commensal bacteria, viridans streptococci, combinatorial libraries
Infective endocarditis and dental procedures

H. Ito

Sanguis

S. oralis

I. Infective endocarditis and dental procedures

S. Sanguis

H. Ito

Infective endocarditis and dental procedures

Sanguis

S. oralis
Actinobacillus actinomycetemcomitans
Porphyromonas gingivalis

Actinobacillus actinomycetemcomitans and Porphyromonas gingivalis were the predominant periodontal pathogens found in the study. These bacteria have been associated with various periodontal diseases, including periodontitis.

These bacteria were found to be present in high numbers in the diseased sites, indicating their role in the pathogenesis of periodontal disease.

The presence of these bacteria in the diseased sites suggests that they may be important factors in the development of periodontal disease. Further studies are needed to determine the exact role of these bacteria in the disease process.

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Granulicatella adiacens

Mean endocarditis induction rate (%)
(1) Heart impairment

(2) Bacteremia

Disease

(3) Bacterial virulence

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A. actinomyctemcomitans and P. gingivalis have been associated with a number of diseases that can result in heart failure. It has been demonstrated that A. actinomyctemcomitans and P. gingivalis are present in the bloodstream of patients with heart failure. It is believed that these bacteria can cause inflammation and damage to the heart muscle, leading to heart failure. Therefore, early detection and treatment of A. actinomyctemcomitans and P. gingivalis could be beneficial in preventing heart failure.

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Infective endocarditis and dental procedures

H. Ito

Infective endocarditis and dental procedures

Infective endocarditis (IE) is an inflammatory condition of the endocardium, the inner lining of the heart chambers, valves, or heart covering. It occurs when bacteria or virulent fungi infect the heart valves, leading to the formation of vegetation on the valve surface. This vegetation can cause valve damage, and if left untreated, can lead to serious complications such as heart failure, stroke, and death.

Dental procedures, particularly those involving the manipulation of the gums or teeth, can cause bacteria to enter the bloodstream, increasing the risk of infective endocarditis. This is especially true for individuals with pre-existing heart conditions, such as congenital heart disease or previous valve replacement surgery.

Preventive measures include the use of antibiotics before and after dental procedures, particularly for individuals at high risk for IE. This strategy aims to reduce the risk of bacterial infection during dental procedures and thus minimize the risk of IE.

In summary, dental procedures can be a source of bacteria that can lead to infective endocarditis, particularly in individuals with pre-existing heart conditions. Therefore, it is crucial to implement preventive measures to reduce the risk of IE when undergoing dental procedures.
Infective endocarditis and dental procedures

Name of amino acid at the defined position
H. Ito  Infective endocarditis and dental procedures

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