

Systemic Effect of Oral Disease

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Citation

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Abstract

The oral cavity is the site of many infectious and inflammatory disease. Systemic diseases have been recently been associated with of the oral diseases and chronic periodontitis is probably the most prevalent and strongest epidemiological and plausible mechanistic associations with these systemic diseases. However, poor oral hygiene, the bacterial colonization of the teeth, possibly introduce more bacteria into tissue and the blood stream, leading on to increased prevalence and magnitude of bacteremia. This article reviews the oral disease link between the systemic disease, which will help family physicians in their earlier detection and management.

INTRODUCTION

The oral cavity is the sites of many infectious and inflammatory disease which has recently been associated with systemic diseases such as diabetes, cardiovascular disease, bacterial pneumonia and pre-term low births. Oral infections are predominantly anaerobic, and gram negative rods being the most common isolates. The anatomic closeness of these microfloras to the blood stream can facilitate bacteremia and systemic spread of bacterial products, components, and immune complexes.

SPREAD OF ORAL INFECTIONS

The incidence of bacteremia following dental procedures as tooth extraction, endodontic treatment, periodontal surgery, and root scaling has been well documented. The mechanisms or pathways linking oral infections to secondary systemic effect are: metastatic spread of infection from the oral cavity as a result of transient bacteremia, metastatic injury from the effects of circulating oral microbial toxins, and metastatic inflammation caused by immunological injury induced by oral micro-organisms.

ORAL DISEASE AND SYSTEMIC DISEASE

Periodontal disease is group of condition in which inflammation and destruction of the attachment apparatus of the teeth (Mobility of the teeth, bleeding from the gum, gum inflammation).

The relationship between oral infection and systemic diseases has been related to periodontal disease, by far the most common oral infection. Factors that place on individuals at high risk of periodontitis may also place them

at high risk for systemic diseases such as cardiovascular disease. Tobacco smoking, stress and aging are common risk factors for both periodontitis and systemic disease. Studies have demonstrated that genetic factors shared by periodontitis, cardiovascular disease and preterm labor are common.

From the available literature it appears that total numbers of leukocytes and plasma levels of C-reactive protein (CRP) are consistently higher in periodontitis patients compared to healthy controls. Red blood cells count and levels of the hemoglobin are lower in periodontitis and there is a trend towards anemia of chronic disease. Periodontitis is associated with cardiovascular diseases.

Pneumonia can result from anaerobic bacteria and dental plaque seems to be a logical source of these bacteria, especially in patients with periodontal disease. Such patients harbor a large number of subgingival bacteria, particularly anaerobic species. Changes in hormone levels during pregnancy promote an inflammation termed as pregnancy gingivitis. Oral infections seem to increase the risk for or contribute to low birth weight in newborns. A gram negative infection, periodontal disease may have the potential to affect pregnancy outcome. During pregnancy, the ratio of anaerobic gram negative to aerobic bacteria increases in dental plaque in the second trimester. The gram negative bacteria associated with progressive disease can produce a variety of bioactive molecules that can directly affect the host. One microbial component, LPS (lipopolysaccharide), can activate macrophages and other cells to synthesis and secrete a wide array of molecules, including the cytokines,

TNF- α , IL1, and PGE2. If they escape into the general circulation and cross the placental barrier, they could augment the physiologic levels of PGE2 and TNF- α in the amniotic fluid and induce premature labor. The periodontitis may be marker for preterm delivery susceptibility as well as potential risk factor.

Periodontal disease often coexists with severe diabetes mellitus. Severe periodontal disease increases the severity of diabetes mellitus and complicates metabolic control. An infection-mediated upregulation cycle of cytokine synthesis & secretion by chronic stimulus from LPS and products of periodontopathic organisms may amplify the magnitude of advanced glycation end product mediated cytokine response in diabetes mellitus. Cytokine upregulation explains the increase in tissue destruction seen in diabetic periodontitis and how periodontal infection may complicate the severity of diabetes and the degree of metabolic control.

GENERAL MANAGEMENT CONSIDERATIONS

Personal oral hygiene practices, such as tooth brushing and use of inter dental cleaning aids, are most effective ways of maintaining good oral health. Use of simple material such as warm salty mouth rinse or commercial mouth wash (chlorhexidine) to improve oral hygiene cost effectively. Family physician should be able to recognize the oral disease to provide appropriate care & referral.

MCQ

Q1. Which of following systemic diseases are associated with effect of the oral cavity infection.

1. Cardiovascular disease
2. Bacterial pneumonia
3. Pre-term low births
4. Diabetes
5. All of above

Q2. Which of the following oral disease may have systemic consequences/

1. Dental caries
2. Periodontal disease

3. Gingival disease

4. None of these

Q3. Risk factors for both periodontitis and systemic disease.

1. Tobacco smoking
2. Stress
3. Aging
4. Genetic factor
5. All of the above

Q4. Which of the following are true

1. No effect of periodontal disease on other organ
2. The C-reactive protein level is higher in cardiovascular and periodontal disease
3. The red blood counts and levels of haemoglobin are higher in periodontitis
4. None of these

Q5. Which of the following bacterial infections are common for periodontal disease and pre-term delivery

1. Gram negative bacteria
2. Anaerobic bacteria
3. Anaerobic gram negative bacteria
4. Anaerobic gram positive bacteria

ANSWER KEY

1. (5)
2. (2)
3. (5)
4. (2)
5. (3)

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References

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