



# **Second Semester-Impact of Periodontal Infection on Systemic Health (part2)**

## **Lec.16**

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# Periodontal Disease and Asthma

- Evidence evaluating the relationship between periodontal disease and asthma.
- The largest study has been a case–control study of 220 adults, half with severe asthma and half without asthma.
- After adjusting for age, smoking habit, education level, and body mass index, **people with periodontitis were 4.8 times more likely to have severe asthma than those without periodontitis.**

# Periodontal Disease and Pregnancy Outcome

- **Low-birth-weight (LBW) infants**

Low-birth-weight (LBW) infants (i.e., those weighing <2500 g at birth) are 40 times more likely to die during the neonatal period than normal-birth-weight (NBW) infants.

- **Causes of LBW**

- preterm labor or premature rupture of membranes (PROM).
- Smoking.
- Alcohol
- drug use during pregnancy.
- Inadequate prenatal care.
- race; low socioeconomic status;
- hypertension;
- old or young maternal age;
- diabetes
- genitourinary tract infection.
- Periodontal disease.

# Role of Periodontitis

Excellent systematic reviews with meta-analyses have examined the wide range of studies evaluating the relationship between periodontitis and pregnancy outcomes . These studies consistently demonstrated a significant association between periodontitis and adverse pregnancy outcomes.

**There are two major pathways by which periodontal diseases may be associated with increased adverse pregnancy outcomes:**

- (1) A direct pathway in which oral microorganisms disseminate to the fetal-placental unit either through a hematogenous route from the oral cavity or by an ascending route via the genitourinary tract,
- (2) An indirect pathway in which elevated inflammatory mediators from the periodontal tissues reach the fetal-placental unit directly through the systemic vasculature or reach the liver and stimulate hepatic production of even more proinflammatory cytokines, which subsequently affects the fetal-placental unit.

In a cross-sectional study, women who had LBW infants had significantly higher levels of

- ❖ *Aggregatibacter* (formerly *Actinobacillus*) *actinomycetemcomitans*,
- ❖ *Tannerella forsythia*
- ❖ *P. gingivalis*
- ❖ *Treponema denticola* in their subgingival plaque than did the control women who had NBW infants

remote gram-negative infection (Periodontitis)



Exotoxaemia → Bacteria and products in amnion



Inflammatory response with cytokine production in amnion  
(including IL-1, TNF- $\alpha$ , and IL-6)



Increased amniotic prostaglandin production



Preterm contraction of the uterus



Preterm labor

# Periodontal Disease and Chronic Obstructive Pulmonary Disease

- **Chronic obstructive pulmonary disease (COPD)** is characterized by airflow obstruction that results from chronic bronchitis or emphysema.
- ✓ COPD shares similar pathogenic mechanisms with periodontal disease. With both diseases, a host inflammatory response is mounted in response to chronic challenge
  - by bacteria in periodontal disease
  - by factors such as cigarette smoking in COPD.
- ✓ A systematic review of 14 studies and almost 4000 subjects showed a significant twofold increased risk of COPD in those with periodontal disease as compared with those without.
- ✓ Most COPD exacerbations are caused by infections. In controlled clinical trials, scaling and root planing was associated with a decrease in the frequency of COPD exacerbations compared with nontreatment.

# Periodontal Disease and Acute Respiratory Infections

- ❖ The upper respiratory passages are often contaminated with organisms derived from the oral, nasal, and pharyngeal regions
- ❖ Pneumonia is an infection of the lungs that is caused by bacteria, viruses, fungi, or mycoplasma and is broadly categorized as either
  - **Community-acquired.**
  - **Hospital-acquired.**



## Community-acquired bacterial pneumonia

- Community-acquired bacterial pneumonia is caused primarily by the inhalation of infectious aerosols or the aspiration of oropharyngeal organisms.
- ***Streptococcus pneumoniae*** and ***Haemophilus influenzae*** are the most common.
- To date, no associations have been found between oral hygiene or periodontal disease and the risk for Community-acquired bacterial pneumonia

## Hospital-acquired (nosocomial) bacterial pneumonia

- Gram-negative aerobic organisms
- Hospital-acquired pneumonia is usually caused by the aspiration of oropharyngeal contents during esophageal reflux containing potential respiratory pathogens (PRPs)
- Dental plaque has been shown to serve as a reservoir of PRPs
- Subgingival plaque may also harbor PRPs, and putative periodontal pathogens have been associated with nosocomial pneumonia

**Selective decontamination** is a technique to eradicate PRPs that combines

systemic antibiotics + orally administered nonabsorbable antibiotics

One systematic review showed that mechanical oral hygiene performed in nursing homes and hospitals significantly decreased the occurrence and progression of respiratory tract infections and pneumonia; the review of evidence suggested that “one in 10 cases of death from pneumonia in elderly nursing home residents may be prevented by improving oral hygiene.



**Thank you**