Second Examination - D373 *Principles of Periodontology I*, fall, 2003 Corrected

Instructions: Select the single best answer for each question and enter response onto the computer bubble sheet, onto which you also enter your name and social security number. You have 90 minutes to complete the examination. You must turn in both this examination copy and your answer sheet.

1. Which of the following best describes the relationship between certain herpesviruses and human periodontitis?

   A. Bacterial periodontal pathogens, such as *Porphyromonas gingivalis*, reduce host immune functions, which permits subgingival overgrowth of certain periodontal tissue-destroying herpesviruses.
   B. Cytomegalovirus and Epstein Barr virus-1, when actively replicating, promote opsonization and phagocytic clearance of bacterial pathogens from the subgingival microbiota and thus, help limit progression of periodontal attachment loss.
   →C. A positive relationship exists between subgingival plaque colonization of "red complex" bacterial periodontal pathogens in adults with chronic periodontitis and recovery of cytomegalovirus and Epstein Barr virus-1 from periodontal pockets.
   D. No relationship is known to exist between cytomegalovirus and human periodontitis.

2. Isolation of *Porphyromonas gingivalis* is more common:

   A. in shallow (< 4 mm) sites in non-smokers as compared to smokers.
   B. in shallow (< 4 mm) sites in IL-1 genotype positive subjects as compared to IL-1 genotype negative subjects.
   C. in the initiation of periodontitis as compared to the progression of periodontitis.
   →D. in black (African-American) adults with chronic periodontitis as compared to persons of other racial/ethnic groups with chronic periodontitis.

3. Poor supragingival plaque control (i.e., Plaque Index scores of 2 or 3) and probing depths of > 5 mm is associated with an increased likelihood of subgingival plaque colonization by:

   →A. *Porphyromonas gingivalis*
   B. gram-positive facultative cocci
   C. *Rothia dentocariosa*
   D. *Streptococcus sanguis*

4. The "ecological plaque hypothesis" states that:

   A. Certain dental plaque microorganisms are specifically capable of causing periodontal pathology, with periodontal disease related more to quality of plaque composition rather than merely plaque quantity.
   →B. Certain dental plaque microorganisms are preferentially selected and increase as a result of changes in the local oral environment which adversely alters normal protective microbial homeostatic mechanisms.
   C. All dental plaque microorganisms are equally capable of causing periodontal pathology if present in high enough numbers.
   D. Subgingival overgrowth of bacterial periodontal pathogens, such as Porphyromonas gingivalis and Dialister pneumosintes, is inhibited by the immunosuppressive effects of certain herpesviruses, such as cytomegalovirus and Epstein Barr virus-1.

5. Periodontal superinfection is associated with high subgingival colonization by:

A. *Peptostreptococcus micros*
→B. enteric rods and pseudomonads
C. *Prevotella intermedia*
D. *Fusobacterium nucleatum*

6. Initiation of localized aggressive periodontitis is associated with:

A. *Porphyromonas gingivalis*
→B. *Actinobacillus actinomycetemcomitans*
C. *Treponema denticola*
D. *Prevotella intermedia*

7. Initiation of chronic periodontitis is associated with:

A. *Porphyromonas gingivalis*
B. *Actinobacillus actinomycetemcomitans*
→C. *Treponema denticola*
D. *Prevotella intermedia*

8. "Red complex" periodontal microorganisms include:

A. *Porphyromonas gingivalis, Actinobacillus actinomycetemcomitans, & Treponema denticola*
B. *Porphyromonas gingivalis, Prevotella intermedia, & Treponema denticola*
C. *Selenomoas noxia, Campylobacter rectus, & Tannerella forsythensis*
→D. *Porphyromonas gingivalis, Treponema denticola, & Tannerella forsythensis*

9. A potential virulence factor common to all "red complex" periodontal microorganisms is:

A. cell motility
B. gram-positive stain reaction
→C. production of a typsin-like proteolytic enzyme
D. leukotoxin

10. "Red complex" periodontal microorganisms:

A. all produce a red-pigmented colony on anaerobic culture media.
→B. are statistically associated with severe periodontal attachment loss.
C. provide support for the "non-specific plaque hypothesis".
D. are all statistically associated with initiation of chronic periodontitis.

11. Current genetic testing in periodontics:

→A. is limited in providing exact information as how to best alter periodontal treatment plans for genotype-positive patients.
B. has been shown to provide high sensitivity and specificity for individual persons in predicting their risk of developing periodontitis.
C. provides reliable information to dentists on risk of periodontitis progression from gingivitis in a variety of racial/ethnic population groups.

D. is limited only to assessment of pro-inflammatory cytokine polymorphisms.

12. Combined carriage of both pro- and anti-inflammatory IL-1 gene polymorphisms is expecially associated with severe periodontitis in adults culture-negative for *Porphyromonas gingivalis* and *Actinobacillus actinomycetemcomitans*, and who also are:

A. smokers.
→B. non-smokers.
C. of male gender.
D. black (African-American).

13. Research studies have found treated periodontitis subjects to be 2.7 times more likely to exhibit tooth loss over 14 years post-treatment and periodontal maintenance if they are:

A. IL-1 receptor antagonist (IL-1ra) genotype positive as compared to gentotype negative.
B. cathepsin C gene mutation negative as compared to mutation positive.
→C. IL-1 genotype positive as compared to genotype negative.
D. non-smokers as compared to smokers.

14. Severe generalized aggressive periodontitis associated with Papillion-Lefevre syndrome is genetically associated with which of the following?

A. Increased pro-inflammatory cytokine secretion by macrophages and plasma cells.
B. LAD1 (integrin) gene defect.
C. Functional polymorphisms in Fc receptor sites on IgG immunoglobulins.
→D. Mutation of the cathepsin C gene on chromosome 11.

15. Which of the following genes exhibit polymorphisms associated with chronic (adult) periodontitis?

A. vitamin D receptor gene
B. IL-4 gene
C. fMLP receptor gene
→D. IL-1 gene

16. Which of the following is associated with complex gene disorders?

A. Consistent clinical disease phenotype (appearance) is found.
B. Environmental factors, as well as genetic factors, are not important in the disease etiology.
→C. Adult onset, with chronic disease state.
D. Significant protein alterations result from gene mutations.

17. In adult twin pair studies, genetic factors were found to be important in periodontal disease due to the finding that the periodontal disease concordance (agreement) rates were:

A. higher in dizygous as compared to monozygous twin pairs.
→B. higher in monzygous as compared to dizygous twin pairs.
C. higher in fraternal as compared to identical twin pairs.
D. similar in identical as compared to fraternal twin pairs.

18. Approximately one-half of the variation seen in periodontal attachment loss among twin pairs is related to hereditary factors, even after statistically controlling for smoking habits, oral hygiene levels, and access to dental care. The severe periodontal attachment loss in Papillion-Lefevre syndrome-associated generalized aggressive periodontitis is related to a single gene (Mendelian) inheritance pattern.

→A. Both statements are true
B. The first statement is true and the second statement is false
C. The first statement is false and the second statement is true
D. Both statements are false

19. " (select one of the following below to fill in blank) " measures the net binding strength between antibodies and antigens (capacity of antibody to interact with antigen).

A. Antigenic determination
→B. Antibody avidity
C. Immunoglobulin switching
D. Opsonization

20. Which of the following is found among smokers of Caucasian (white) racial identification as compared to individuals of black (African-American) racial identification who exhibit chronic periodontitis?

A. Significantly increased IgG_2 serum antibodies and more periodontitis.
B. Similar serum levels of IgG_2 antibodies and less periodontitis.
→C. Significantly lower IgG_2 serum antibodies and more periodontitis.
D. Similar serum levels of IgG_2 antibodies and more periodontitis.

21. Which of the following is the major immunoglobulin class in serum reacting with periodontal microorganisms in the subgingival plaque microbiota of human periodontitis patients?

A. sIgA
B. IgM
→C. IgG
D. IgE

22. Which of the following is associated with the innate immune response in periodontal tissues?

→A. junctional epithelium barrier
B. T helper cells
C. B lymphocytes
D. plasma cells