CHAPTER 11

AGING AND PERIODONTAL DISEASE

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Abstract: Periodontal disease is the most prevalent disease of the oral cavity. The role of aging in periodontal disease is debatable, but the means of preventing periodontal disease are available. This article gives an overview of the role of aging on the periodontium, prevention and therapy of age-related periodontal diseases.

Keywords: Aging, periodontal disease, human

“There are no diseases peculiar to old age and very few from which it is exempt” – Alfred Worcester (1855–1951).

Apt to the above quotation, age seems to take the blame for many diseases. Periodontal disease is one such disease where the role of age is still debatable. Though there are many age-related changes in the oral cavity, by its sheer prevalence rate and association with adults, chronic periodontitis (inflammation of the supporting structures of the tooth) is very highly equated with age. The tooth supporting structures consist of cementum – a hard tissue covering the root, bone – forming a socket within which the tooth is placed, the periodontal ligament fibers connecting the cementum to the bone, and gingiva. Gingiva (gum) is that part of the oral mucosa that covers the jaws and surrounds the necks of the teeth providing protection to the above mentioned structures.

One of the earliest proposals was that, the periodontal disease is of a degenerative nature. Egyptian, Hebrew and Chinese writings from ancient times mentioned “long teeth” as an indicator of old age. Some therefore argued, that periodontitis was a natural consequence of aging. Many other local factors were introduced later as possible causes for periodontal pathology. In the 1950s and 1960s, plaque (an organized microbial matrix) and age were suggested as the primary etiological factors.

factors. The 1998 classification (Armitage, 1999) of periodontal disease made an extensive list of conditions (which are independent of age) out of which, aggressive periodontitis and chronic periodontitis formed different ends of the spectrum. Aggressive periodontitis is one where genetically based defective host factors play a major role, whereas chronic periodontitis, with genetic factors as a baseline, requires both microbes and host factors.

Though age was initially proposed as the primary cause of chronic periodontitis, it has now been proved beyond doubt that plaque is the primary cause. Is age an associated factor? No, since plaque present at any age, can cause chronic periodontitis. Is age a modifying factor? In favor of this is the shift in the microbial flora of plaque from predominantly actinobacillus to porphyromonas gingivalis with advancing age (Rodenburg et al., 1990). Finally the question remains “can age be a risk factor for chronic periodontitis?”

1. AGE: A RISK FACTOR FOR PERIODONTITIS?

Risk is the probability that an individual gets the specific disease in a given period. Risk factors may be environmental, behavioral or biological in nature. The extents to which physiological and pathological changes that accompany aging are due to the aging process itself or caused by concomitant pathosis, medication usage or social and environmental changes is debatable (Locker et al., 1998). Nevertheless, since numerous age-associated changes can be observed in the biochemical, immunological and physiological processes of periodontal tissues, there are reasonable grounds to suspect that aging could potentially be a risk factor for periodontal disease (Papapanou et al., 1989; Ismail et al., 1990).

Periodontal status worsens with age in the general population (Schurch et al., 1988; Beck, 1996; Papapanou et al., 1988). Degenerative changes related to aging are due to prolonged exposure to the primary factor (plaque) and other risk factors over a period of time, which have a cumulative effect. Therefore, periodontitis is not an inevitable result of only aging: on the contrary it may be a contributing factor.

Other factors determining susceptibility and severity of periodontitis are: (i) microbial infection, (ii) host parasite interactions, (iii) external socio-economic influences, (iv) smoking, (v) systemic diseases, and (vi) stress.

2. MICROBIAL ECOLOGY

Studies have shown a correlation between severity of periodontal disease and composition of the sub gingival (below the gum) microbiota. Age induced environmental changes may influence the attachment, growth and metabolisms of microorganisms. The adhesion of microbes to a surface depends on physical and chemical reactions. As age advances, surfaces changes take place due to chemical and physical factors. As the gingiva recedes root dentin, furcations and developmental anomalies get exposed increasing areas vulnerable to plaque attachment.