

Opportunities for advancing dental hygiene research; Periodontitis and premature death: a longitudinal, prospective clinical trial.(Clinical report)

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Periodontitis and Premature Death: a Longitudinal, Prospective Clinical Trial

Periodontal disease is initiated by a biofilm of bacteria on the teeth that trigger an immune-inflammatory response in the adjacent host tissues. It is estimated that 15% to 35% of the adult population in industrialized countries suffers from this multi-factorial illness. In individuals with constitutional proinflammatory traits, the reaction to bacteria may lead to an excessive host response, resulting in general inflammatory reaction. To investigate the relation between periodontitis and general diseases, longitudinal studies spanning several years are recommended to ensure that the time period in which periodontitis develops is taken into account. (1)

In longitudinal studies, individuals are followed overtime with monitoring of risk factors or health outcomes. Outcomes such as mortality and incidence of cancer have been related to employment status, and other variables measured. Most longitudinal studies examine associations between exposure to known or suspected causes of disease and subsequent morbidity or mortality. In the simplest design, a sample or cohort of subjects exposed to a risk factor is identified along with a sample of unexposed controls. The 2 groups are then followed up prospectively, and the incidence of disease in each is measured. By comparing the incidence rates, attributable and relative risks can be estimated.

A problem with the cohort method when applied to the study of chronic diseases is that large numbers of people must be followed up for long periods before sufficient cases accrue to give statistically meaningful results. The difficulty is further increased with low grade, silent and long lasting diseases, such as periodontal disease. There is a long induction period between first exposure to a hazard and the eventual manifestation of disease.

Randomized controlled trials are a superior methodology in the hierarchy of evidence, because they limit the potential for bias by randomly assigning patients for prospective clinical trials. This minimizes the chance that the incidence of confounding variables will differ between the groups.

The advantage of prospective cohort study data is the longitudinal observation of the individual through time and the collection of data at regular intervals. However, cohort studies are expensive to conduct, are sensitive to attrition and take a long follow-up time to generate useful data. Nevertheless, the results that are obtained from long-term cohort studies are of substantially superior quality to retrospective/cross-sectional studies, and cohort studies are considered the gold standard in observational epidemiology.

The baseline cohort for the present longitudinal study was selected in 1985 using the registry file of all inhabitants (n=105,798) of Stockholm County born on the twentieth of any month between 1945 and 1954. Randomized from the file were 3,273 individuals aged 30 to 40 years. In total, 1,676 individuals, 838 women and 838 men, underwent a detailed oral clinical examination. (2) The presence of systemic diseases in the study group were 2,001 compared with data in the following registers from the Swedish National Board of Health and Welfare: the Cancer register, the Hospital register, the Heart Infarct register and the register for Causes of death.

Our hypothesis was that the presence of gingivitis and periodontitis in young adults increases the

risk for future life-threatening diseases. Our aim was to evaluate the role of periodontitis in premature death in a prospective study.

The subjects were divided into clinically examined (group A) and dropout (group B). In addition, all age-matched subjects in Stockholm County constituted group Sc and all age-matched subjects in all of Sweden constituted group S. In January 1985, group Sc comprised 105,798 individuals and Group S 1,254,238 individuals.

The present study addresses the issue of periodontal disease as a risk marker for mortality by evaluating the relationship between periodontitis and premature death 16 years after the diagnosis of periodontitis. Our results confirm the hypothesis that periodontitis in young adults with any missing molars is a risk marker for premature death (Figure 1). (3) The prematurely deceased women in the study were expected to live 36.1 years longer and the deceased men 31.6 years longer. The individuals who died were probably infected with periodontitis many years before the baseline registrations. However, the result in present study showed periodontitis as a risk marker for premature death.

Earlier studies have suggested that the reason for mortality could be the combined effect of periodontal diseases, calculus and dental plaque or the severity of caries, periodontitis, periapical lesions and pericoronitis. (4) We have previously shown in a 17-year prospective study that molars were the teeth most affected in subjects with periodontitis. (5)

[FIGURE 1 OMITTED]

These results have been confirmed in the present investigation. The missing molars in these young individuals signal a long history of chronic inflammatory and microbial burden of periodontitis, but may also reflect an underlying weakness of the host defense system. A very high bacterial load on tooth surfaces and in gingival pockets over a prolonged period may be responsible for the diseases, subsequently causing death. Therefore, reducing the bacterial burden of affected individuals and identifying the bacteria responsible for the diseases causing death in these subjects are critical.

Our findings have public health consequences and may create a basis for prophylactic measures that, in view of the prevalence and outcome of periodontal diseases and the costs it incurs to society, are well warranted.

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