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Increased physical activity reduces prevalence of periodontitis

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Summary *Objectives*. Physical activity has been shown to have a protective relationship with several chronic diseases. Recently, physical activity was also found to reduce the risk of periodontitis in a study in male health professionals. However, the relationship between physical activity and periodontitis in a diverse group of individuals is not thoroughly examined. The purpose of this study was to examine if there is an association between sustained physical activity and periodontitis in a subset of the third national health and nutrition examination survey (NHANES III).

Methods. NHANES III participants 18 years of age or older who had had a periodontal examination and reported to have a similar physical activity (or inactivity) level for 10 years or longer were selected ($n=2521$). Multivariable logistic regression analysis was used to estimate the association between physical activity and periodontitis. The analysis was adjusted for: age, gender, race, education, smoking, body mass index, poverty index, vitamin use, healthy eating index, time since last dental visit, gingival bleeding, and dental calculus.

Results. Engaging in the recommended level of physical activity was significantly associated with lower periodontitis prevalence (OR=0.58, 95% CI, 0.35–0.96). Smoking, however, was found to modify this relationship. The association was strong and significant among never (OR=0.46, 95% CI, 0.23–0.93) and former smokers (OR=0.26, 95% CI: 0.09–0.72), but not among current smokers (OR=1.10, 95% CI: 0.48–2.53).

Conclusions. These results suggest that engaging in the recommended level of exercise is associated with lower periodontitis prevalence, especially among never and former smokers.

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Introduction

Physical activity has a beneficial effect on person's general health and well being. Research has shown protective effects of performing regular physical activity on the risk of coronary heart disease, diabetes mellitus, colon cancer, obesity, osteoporosis, arthritis, hypertension, and high cholesterol.[1] Regular physical activity has also been suggested to increase life expectancy and to improve life quality.[2] Furthermore, among older adults, regular physical activity has been reported to improve the quality of sleep, to reduce depressive symptoms and to reduce the age-associated decline in cognitive ability.[3–5] Physical activity was also suggested to play a role in the management of anxiety and stress.[6,7] In addition to all the health benefits, regular physical activity has a significant impact on reducing the health care costs, through decreasing the number of hospital stays and physician visits as well as reducing the need for medications.[8]

Periodontitis is a prevalent chronic disease worldwide and recently has been suggested as a possible risk factor for several systemic conditions.[9] Several environmental and systemic factors such as smoking, diabetes and stress, have been suggested to increase the risk for developing periodontitis.[10] Research on possible protective modalities to prevent or halt the rate of periodontitis progression is obviously needed. In spite of the promising impact of maintaining regular physical activity on reducing the risk of several chronic conditions, research on the relationship of physical activity and periodontitis is limited. A study, conducted in Japan, found an inverse association between physical fitness and periodontitis prevalence.[11] Another study, conducted in Finland, found that long-term physical inactivity is associated with a higher need for periodontal treatment.[12] A recent study, conducted in US male health professionals, found an inverse relation between physical activity level and the risk for developing periodontitis.[13] The objective of this study was to examine the relationship between sustained physical activity and prevalence of periodontitis in a diverse United States population.

Materials and methods

Study population

The present study utilized a sub-sample of a large US national survey, the third national health and nutrition examination survey (NHANES III), which was conducted by the National Center for Health Statistics from 1988 to 1994. The survey provides information on the health and nutritional status of the United States' civilian, non-institutionalized population.[14] Interviews and direct physical examinations were used to obtain these information. A total of 33,994 individuals were interviewed; of these 31,311 were provided a comprehensive physical examination.[15] Periodontal examination were provided to participants 13 years of age or older ($n=19,810$). For the present study, participants 18 years of age or older who were provided a periodontal examination were included ($n=13,665$). Of these, persons who reported, at the time of NHANES III interview, to have physical activity (or inactivity) similar to their activity level 10 years prior to NHANES III interview ($n=2801$) were selected. We included only these individuals ($n=2801$) with stable activity (or inactivity) since, if physical activity has any effect on periodontitis, it is not likely to be immediate. Thus, regular physical activity for longer time is needed.

We then excluded persons who were classified under the race/ethnicity category 'Others' due to their small sample size ($n=133$). Diabetics were also excluded ($n=147$), since diabetes influences the person's ability to exercise and is a known risk factor for periodontitis. The sample available for the present analysis consisted of 2521 individuals.

Periodontitis

Periodontal examination for NHANES III, was performed around the teeth of two randomly assigned quadrants, one maxillary and one mandibular.[14] Partially erupted teeth, retained roots and third molars were excluded.[14] Probing depth and attachment loss were recorded at the mid-facial and mesio-facial aspects of each tooth. For the present study, presence of at least one site with both an attachment loss of ≥ 3 and probing depth of ≥ 4 mm was used to define periodontitis as was the case in similar studies.[16,17]

Physical activity

NHANES III data on frequency of exercise and physical activity were collected by administering a set of questionnaire during the household adult interview.[14] This questionnaire was adopted from the 1985 National Interview Survey and had been used in several previous studies.[18–20] Respondents were questioned on type and frequency of nine