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study

Periodontitis and incident type-2 diabetes: a prospective cohort study

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RELEVANT BACKGROUND

A bidirectional relationship between diabetes and periodontitis has been suggested for some time. The proposed biological link between these two diseases seems to be the inflammatory burden of the individual. Numerous studies have shown that adults with diabetes have a higher prevalence of severe periodontitis than those without diabetes. However, there are not many well-designed studies supporting the concept of periodontitis as being a true risk factor for diabetes development.

AIMS

The aim of this study was to investigate whether the presence of periodontitis can be regarded as independent risk predictor for type-2 Diabetes Mellitus in a group of diabetes-free men aged between 58 and 72 years.

MATERIALS AND METHODS

Data were retrospectively retrieved from the PRIME study (1991-1994), a longitudinal cohort study of cardiovascular disease in Northern Ireland. The sample population consisted of men working in local industry, the civil service, and general medical practices. Rescreening of the population was carried out from 2001 to 2003. The periodontal measurements (PPD, CAL) were made at four sites per tooth. Periodontitis was defined according to Page & Eke (2007). Parallel to periodontal examination, participants completed questionnaires gathering information on their medical history, tobacco use, and social and demographic background. In addition, their height and body weight were assessed. Fasting blood samples were obtained and analysed for total cholesterol and C-reactive protein (CRP). Different statistical models were applied to adjust for the potential confounding variables of age, number of teeth, smoking, tooth-brushing frequency, BMI, cholesterol, CRP, history of ACVD, hypertension, education, dental attendance, and marital and socio-economic status.

results

- 1,331 men (mean age 63.7) were included in the study and 1,036 completed it.
- 58.5% men had no or mild periodontitis, 21.2% moderate periodontitis, and 20.4% severe periodontitis.
- Men with moderate/severe periodontitis at baseline presented significantly fewer teeth ($p=0.01$), higher CRP values ($p=0.02$), higher smoking exposure ($p<0.001$), higher prevalence of hypertension ($p<0.05$), lower socio-economic status ($p<0.01$), fewer years in education ($p<0.01$), and attended the dentist "only when in trouble" more ($p<0.01$) than those with no/mild periodontitis.
- During the follow-up of the study (mean 7.8 years), 6% of the participants were diagnosed with T2DM. Among these, 4.9% in the no/mild periodontitis group were diagnosed with T2DM, compared to 7.6% in the moderate/severe periodontitis group. The Kaplan-Meier analysis showed greater probability of being diagnosed with diabetes if the baseline diagnosis was moderate/severe periodontitis ($p=0.026$).
- After adjustment for confounders, the hazard ratio (HR) for the moderate/severe group vs mild/no periodontitis was 1.69 ($p=0.02$).



LIMITATIONS

- Confounding risk factors for T2DM such as diet, family history of diabetes, physical activity, low HDL, depression, and medication were not included in the study design.
- The cohort included only men.
- Periodontal examination was made only at baseline. No information was provided about the changes of the periodontal condition over time. It is therefore unknown if the no/mild periodontitis subjects developed periodontitis or if the moderate/severe men were treated for the disease during follow-up.
- Diagnosis of diabetes during follow-up was based on voluntary attendance with the general medical practitioner.



CONCLUSIONS

- Moderate/severe periodontitis may be an independent risk predictor for T2DM in males of 58-72 years of age in Northern Ireland.



IMPACT

- Dentists and general medical practitioners should be aware of the relevance of periodontitis a possible risk factor for the development of T2DM.



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