

Few studies addressing toothbrushing frequency and periodontitis

Abstracted from

Zimmermann H, Zimmermann N, Hagenfeld D, Veile A, Kim TS, Becher H.

Is frequency of tooth brushing a risk factor for periodontitis? A systematic review and meta-analysis.

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Question: Is there an association between tooth brushing frequency and periodontitis?

Data sources PubMed and seven other databases.

Study selection English-language articles evaluating the association between the frequency of tooth brushing and periodontitis were considered. Two reviewers independently conducted study selection with study quality being assessed using the Health Evidence Bulletin (HEB) Wales checklist.

Data extraction and synthesis Relevant study characteristics were extracted and where necessary, effect measures and corresponding confidence intervals (CIs) were recalculated from the reported papers. Random and fixed effects meta-analyses were conducted.

Results Fourteen studies were included (12 cross-sectional, two case-controlled). Sample sizes ranged from 44 - 9203. A fixed effects meta-analysis (12 cross sectional studies) found a significant overall odds ratio (OR) 1.41 (95%CI: 1.25-1.58, $P < 0.0001$). A random effects meta-analysis (all 14 studies) found OR = 1.44 (95%CI: 1.21-1.71, $P < 0.0001$) a slight indication for heterogeneity ($I^2 = 48\%$, $P = 0.02$).

Conclusions There are relatively few studies evaluating the association between tooth brushing frequency and periodontitis. A clear effect was observed, indicating that infrequent tooth brushing was associated with severe forms of periodontal disease. Further epidemiological studies are needed to precisely estimate the effect of key risk factors for periodontitis and their interaction effects.

Commentary

The findings from the systematic review were that infrequent tooth brushing was statistically associated with periodontitis, but the association was small. In this review, frequency of tooth brushing was used as a proxy for oral hygiene. Of the included studies many different categories of tooth brushing frequency were used. While the authors did not provide a definition for infrequent brushing, it appears they categorised infrequent brushing as once or less per day.

Other difficulties with this systematic review related to the inclusion criteria and confounding. Two studies were included involving participants younger than 22 years, a group in which the prevalence

of periodontitis is low.¹ Six studies failed to control for confounders, for example, smoking, yet smoking is a well-known risk factor for periodontitis.²

The authors themselves did not define periodontitis and highlighted the lack of a universal definition. In addition, they found many different measures were used for the severity of periodontitis in the included studies, which made synthesising the evidence difficult. In other fields of medicine core outcome sets have been developed; these are standardised sets of outcome measures which should be included in all clinical trials of interventions for a specific health condition.³ Given the range of outcome measures found in this systematic review the development of a core outcome set for periodontitis would be beneficial. Core outcome sets typically include outcome measures of importance to clinicians, researchers and patients.

Periodontitis is not an inevitable part of ageing⁴ and at present there are no tests available to inform on who might be likely to develop periodontal disease. Therefore it is important to mitigate the possibility of periodontitis by advising patients on how to reduce the risk factors, and the findings from this study support advice for twice daily tooth brushing (Public Health England, 2014).

Practice point

- Twice daily tooth brushing should continue to be recommended to promote good oral health.

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4. Papapanou NN, Linde J, Sterrett JD, Eneroth L. Considerations on the contribution of aging to loss of periodontal support. *J Clin Periodontol* 1991; **18**: 611–615.
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