Manas Dave[1] reflects on topics discussed in our sister journal *Evidence-Based Dentistry*.

EBD spotlight:

The association between second-hand smoke and periodontal disease

Author information

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Is secondhand smoke exposure associated with poor periodontal status in children and adolescents? A systematic review and meta-analysis was published in the *European Archives of Paediatric Dentistry* in April this year.[1] A commentary on the paper was published in *Evidence-Based Dentistry* this September.[2]

Second-hand smoke (SHS) has been shown to increase the risk of developing chronic respiratory diseases (such as asthma) and infections (such as bronchiolitis and pneumonia), ear infections, stroke, heart disease and premature death.[3,4,5,6,7] A meta-analysis showed a significant association (for case-control and prospective cohort studies) on the association of SHS and overall cancer risk in never smokers.[8] Children exposed to tobacco smoke are also more likely to take up smoking themselves when they are older.[7] For oral health conditions, some studies have shown a link between SHS with dental caries[9] and periodontal disease.[10] Therefore, the aim of this systematic review and meta-analysis was to summarise the association between SHS exposure and periodontal disease.[2]

Methods

An electronic database search of Medline, Embase, Web of Science, Scopus and LILACS was conducted up to 23 November 2021 with no date or language restrictions. The reference lists of included studies were manually searched and the grey literature also searched (OpenGrey and Google Scholar for the first 200 most relevant hits). Only studies with systemically healthy individuals aged up to 15 years were included. Observational studies, non-randomised and randomised controlled trials were included in the eligibility criteria. An adapted Newcastle-Ottawa scale was used for quality assessment. Information extraction included exposure determination (biochemical quantification of cotinine in blood or saliva), socioeconomic status (parental income or schooling as the confounding control) and periodontal status.

Results

Eight cross-sectional studies were included in this systematic review.

Quality assessment determined only two studies had high quality, three studies had satisfactory sample sizes and no studies provided any data on non-response rates. Most studies measured SHS exposure using non-validated tools.

Meta-analysis was only possible for gingival index and probing pocket depths. All studies (including 3,371 individuals) contributed to the analysis. The random effects standardised mean differences (SMD) showed a positive association between SHS exposure and higher gingival index scores (SMD = 1.03, 95% CI 0.17-1.89; I2 = 97.6%). Therefore, those exposed to SHS had higher levels of gingival inflammation than those unexposed.

Children from regions with higher prevalence of current smokers, and which were exposed to SHS, had higher gingival index scores (SMD = 1.48, 95% CI 0.26-2.70; I2 = 98.1%) compared to those exposed from countries with lower prevalence of current smokers (SMD = 0.21, 95% CI 0.22-0.65; I2 = 66.8%).

Four studies were included in the analysis for probing pocket depths. There was no difference in the pooled estimate of those exposed to SHS compared to unexposed (SMD = 0.34, 95% CI 0.14-0.82; I2 = 88.3%).

Two studies provided data on clinical attachment loss. Higher levels of clinical attachment loss were found amongst children exposed to SHS (after adjustments for age, gender and plaque scores).

There were no differences in gingival index and probing pocket depth with the socio-demographic index of any country, the age of the cohort as well as the period in which the study was carried out.

The average extent of bleeding on probing was not associated with SHS exposure.

Conclusions

The authors concluded:

'Considering the limitations of the present systematic review, it has been shown that there is currently very low certainty evidence showing that children up to 15 years exposed to second hand smoke have higher scores of gingival index when compared to their counterparts, although no difference was detected for probing pocket depths'.

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Comments

Overall, the evidence contributing to this systematic review and meta-analysis is of low quality and high heterogeneity, therefore there are limitations in the conclusions which can be drawn. There are confounding factors between SHS and periodontal health that can only be controlled through randomisation however no randomised control trials were identified in this systematic review. There were methodological differences of the included studies; for example, only one study used cotinine levels to determine exposure status, the rest of the studies used self-reporting assessments. An interesting finding from this study is that children from locations with higher prevalence of current smokers (who were exposed to SHS) had higher gingival index scores (compared to regions with lower prevalence). Further research is needed to determine the impact of SHS on oral health conditions. Despite this, dental professionals should continue to promote parental/guardian smoking cessation as there is evidence to suggest that SHS can cause serious health problems in children.[4,5,6]

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