

DENTAL CARIES

Incidence and increment of root caries



BACKGROUND

A high prevalence of root caries has been identified in populations throughout the world. Part of this can be explained by more people living longer and retaining more of their natural teeth. With this change in the population, root caries is predicted to become a significant public health issue. Studies of the incidence and increment of root caries are usually done in developing countries, with these measures varying from 12.4% to 77% for the incidence of root caries and from 0.3 to 4.4 on root surfaces for the increment. These variations are attributed to a lack of consistency in reporting used by the studies and a significant diversity of the population groups studied. Previous analyses, therefore, have been insufficient in obtaining accurate data on the incidence and increment of root caries. A systematic review, quantitative meta-analysis, and meta-regression of root caries incidence and increment were undertaken.

METHODS

The systematic review focused on the PubMed and EMBASE databases and was limited to English language studies published before 2017. The incidence, which is defined as the percentage of the population with new root caries in a specific period of time, and the increment, which is the number of new root caries that occur in an individual in a specific period of time, were sought at the population level throughout the world. The review also focused on the differences in estimates of root caries incidence and increment relative to the duration of the study and the type of study. Sources of heterogeneity among root caries studies were identified. The search resulted in 41 studies selected for full-text reading and 20 studies selected for the meta-analysis.

RESULTS

The overall quality of evidence was medium for all the studies involved in the meta-analysis. Significant heterogeneity was found across the studies. Although further breakdown analysis by age group was impossible, the mean baseline age for the participants of the studies ranged from 60 to 70 years.

The annualized incidence in the studies was estimated to be 18.25%, and the estimated increment was 0.45 root decayed filled root surfaces (DFS). These estimates were influenced by the length of follow-up in the studies. Annualized root DFS incidence and increment from studies lasting less than 2 years were 32.95% and 0.64 root surfaces, respectively. When studies lasted over 5 years, the cumulative annualized root caries incidence was 9.4% and the increment was 0.43 root surfaces. The type of study had no effect on these estimates.

The meta-regression was able to explain the variance in root caries incidence by the length of follow-up in the study, baseline age, and baseline root DFS, which were 44.08%, 22.12%, and 24.80%, respectively. The variance in increment was explained by the length of follow-up (20.24%), the root caries data adjustment (13.80%), the source of the participants (10.75%), the baseline root DFS (2.89%), and the number of exposed root surfaces (39.32%). None of these variables were found to be significant in multivariable analysis.

DISCUSSION

Although the type of study had no influence on the incidence and increment of root caries, with a longer period of follow-up, both the annualized incidence and increment of root caries were lower. The research involved various populations, various ways to present root caries data, differing ages of participants, and differing clinical characteristics. With all this diversity, the estimated root caries incidence and increment data should be interpreted cautiously.

Clinical Significance

Future caries research should adhere to more standardized reporting to facilitate the usefulness of pooled estimates of root caries. With longer studies, the incidence of root caries appeared to be reduced. It's possible that there were higher numbers of individuals with illness who dropped out of the longer studies, leaving healthier populations to complete the investigations, which can skew the results. However, even considering this possibility, it's clear that root caries is a risk faced by even healthy older individuals. Instituting population-based preventive programs may be an effective means for achieving a reduction in root caries.

Hariyani N, Setyowati D, Spencer AJ, et al: Root caries incidence and increment in the population – A systematic review, meta-analysis and meta-regression of longitudinal studies. *J Dent* 77:1-7, 2018

Reprints available from N Hariyani, Australian Research Ctr for Population Oral Health, Level 9 Adelaide Health & Medical Sciences Bldg, Adelaide, South Australia, 5000, Australia; e-mail: ninuk.hariyani@adelaide.edu.au