Effect of restorations using a flowable resin composite in non-carious cervical lesions: a systematic review and meta-analysis.

OBJECTIVES: To answer the following PICO question (participant, intervention, comparator and outcome): Does flowable resin composite restorations compared with regular resin composites improve the marginal adaptation, marginal discoloration and retention rates of restorations placed in non-caries cervical lesions [NCCLs] of adults?, through a systematic review and meta-analysis.

STUDY SELECTION: We included randomized clinical trials (RCTs) that answered the PICO question. RCTs were excluded if cavities other than NCCLs were treated; indirect restorations; polyacid-based resins instead of composite resins were employed, restorations in primary teeth and restorations were placed in carious cervical lesions. The risk of bias tool of the Cochrane Collaboration was applied in the eligible studies and the GRADE tool was used to assess the quality of the evidence.

DATA: After duplicates removal, 5137 articles were identified. After abstract and title screening, 8 studies remained. Six were at "unclear" risk of bias. The study follow-ups ranged from 1 to 3 years. No significant difference was observed between groups for loss of retention and marginal discoloration in all follow-ups. Better marginal adaptation was observed for restorations performed with flowable composites. At 1-year (risk ratio=0.27 [0.10 to 0.70]) and 3-year (risk ratio=0.34 [0.17 to 0.71]) follow-ups, flowable composites showed a risk 73% and 66% lower than regular composites for lack of adaptation, respectively. The evidence was graded as moderate quality for loss or retention at 3 years due to risk of bias and low and very low for all other outcomes due to risk of bias, imprecision and inconsistency.

CONCLUSIONS: We have moderate confidence that the resin composite viscosity does not influence the retention rates at 3 years. Similar marginal discoloration and better marginal adaptation was observed for flowable composites but the quality of evidence is doubtful. (PROSPERO CRD42015019560).
OBJECTIVES: The total body of evidence finds fluoride varnish effective to prevent caries. However, most trials were conducted in high-risk populations, with more recent trials on low-risk groups finding a lower efficacy. We aimed to assess the cost-effectiveness of fluoride varnish application in clinic setting in populations with different caries risk.

METHODS: A mixed public-private-payer perspective in the context of German health care was performed using a lifetime Markov model. Effectiveness data were derived from an update of the most recent systematic Cochrane review and synthesized in three different risk groups according to control group caries increment via random-effects meta-analysis. Varnish was assumed to be applied twice yearly between age 6 and 18 years. Teeth with carious defects would be treated restoratively and could experience further follow-up treatments. Costs were deduced from German fee item catalogues. Monte Carlo microsimulations were used for to analyse lifetime treatment costs and caries increment (Euro/Decayed, Missing, Filled Teeth (DMFT)).

RESULTS: In low-risk groups, fluoride varnish was nearly twice as costly and minimally more effective (293 Euro, 8.1 DMFT) than no varnish (163 Euro, 8.5 DMFT). The incremental cost-effectiveness ratio (ICER) was 343 Euro spent per avoided DMFT. The ICER was lower in medium-risk (ICER 93 Euro/DMFT) and high-risk groups (8 Euro/DMFT).

CONCLUSIONS: Application of fluoride varnish in the clinic setting is unlikely to be cost-effective in low-risk populations. There is the need to either target high-risk groups or to provide fluoride varnish at lower costs, possibly in nonclinic settings.
Recent progress in the field of molecular biology and techniques of DNA sequence analysis allowed determining the meaning of hereditary factors of many common human diseases. Studies of genetic mechanisms in the aetiology of caries encompass, primarily, 4 main groups of genes responsible for (1) the development of enamel, (2) formation and composition of saliva, (3) immunological responses, and (4) carbohydrate metabolism. The aim of this study was to present current knowledge about the influence of single nucleotide polymorphism (SNP) genetic variants on the occurrence of dental caries. PubMed/Medline, Embase, Cochrane Library databases were searched for papers on the influence of genetic factors connected with SNP on the occurrence of dental caries in children, teenagers, and adults. Thirty original papers written in English were included in this review. Study groups ranged from 30 to 13,000 subjects. SNPs were observed in 30 genes. Results of the majority of studies confirm the participation of hereditary factors in the aetiology of caries. Three genes, AMELX, AQP5, and ESRRB, have the most promising evidence based on multiple replications and data, supporting a role of these genes in caries. The review of the literature proves that SNP is linked with the aetiology of dental caries.
**A scoping review of epidemiologic risk factors for pediatric obesity: Implications for future childhood obesity and dental caries prevention research.**

**OBJECTIVES:** Studies have identified risk factors for childhood obesity. The purpose of this scoping review was to develop a conceptual model to identify non-modifiable and modifiable risk factors for childhood obesity and to illustrate how these findings are relevant in developing interventions aimed at preventing obesity and dental caries in children.

**METHODS:** The authors searched PubMed and Embase and limited the study to English-language publications. A total of 2,572 studies were identified. After de-duplication, 2,479 studies remained and were downloaded into a citation-management tool. Two authors screened the titles and abstracts for relevance. Two hundred and sixty studies remained and were retrieved for a full-text review, and 80 studies were excluded, resulting in 180 studies included in the scoping review. An inductive content analytic methods was used to organize all statistically significant obesity risk factors into seven domains, which were classified as non-modifiable or modifiable; then a conceptual model of common risk factors associated with childhood obesity and dental caries was developed.

**RESULTS:** Non-modifiable obesity risk factors include biological and developmental (e.g., genes, developmental conditions, puberty), sociodemographic and household (e.g., race/ethnicity, socioeconomic status, parent education, unemployment), cultural (e.g., degree of acculturation), and community (e.g., neighborhood composition). Modifiable risk factors included behavioral (e.g., diet, physical activity, weight), psychosocial (e.g., maternal stress, family functioning, parenting practices, child temperament), and medical (e.g., parent smoking, maternal health, child health).

**CONCLUSIONS:** Identifying common risk factors has important implications for future oral health research aimed at preventing childhood obesity and dental caries. Epidemiologic knowledge gleaned from the literature can be used to develop rigorous interventions and programs aimed at preventing these highly prevalent diseases and improving health outcomes for children.
Mechanisms of silver diamine fluoride on arresting caries: a literature review. [Review]

Source

Local Messages
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Abstract
OBJECTIVE: To review the evidence regarding the mechanisms of silver diamine fluoride (SDF) for arresting caries.

METHODS: A literature search was conducted using the keywords silver diamine fluoride, and its alternative names, in seven databases: PubMed, Embase and Scopus (English); China National Knowledge Infrastructure (Chinese); Biblioteca Virtual em Saude (Portuguese); Biblioteca Virtual en Salud Espana (Spanish); and Ichushi-Web (Japanese). The titles and abstracts were screened. Full texts were retrieved for publications that studied mechanisms of actions of SDF, including its effects on remineralisation of carious lesions and on cariogenic bacteria.

RESULTS: A total of 1,123 publications were identified. Twenty-nine articles were included and they investigated the effect of SDF on cariogenic bacteria and dental hard tissues. Eleven studies investigated the antibacterial properties of SDF. They found that SDF was bactericidal to cariogenic bacteria, mainly Streptococcus mutans. It inhibited the growth of cariogenic biofilms on teeth. Twenty studies reported the remineralisation of demineralised enamel or dentine by SDF. They found that mineral loss of demineralised enamel and dentine was reduced after SDF treatment. A highly mineralised surface rich in calcium and phosphate was formed on arrested carious lesions. Four studies examined the effect of SDF on dentine collagen. They found that SDF inhibited collagenases (matrix metalloproteinases and cysteine cathepsins) and protected dentine collagen from destruction.

CONCLUSION: SDF is a bactericidal agent and reduces the growth of cariogenic bacteria. It inhibits demineralisation and promotes the remineralisation of demineralised enamel and dentine. It also hampers degradation of the dentine collagen.

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Predicting trend of early childhood caries in mainland China: a combined meta-analytic and mathematical modelling approach based on epidemiological surveys.

**Source**

**Abstract**
Early childhood caries (ECC) is the most common chronic disease in young children. A reliable predictive model for ECC prevalence is needed in China as a decision supportive tool for planning health resources. In this study, we first established the autoregressive integrated moving average (ARIMA) model and grey predictive model (GM) based on the estimated national prevalence of ECC with meta-analysis from the published articles. The pooled data from 1988 to 2010 were used to establish the model, while the data from 2011 to 2013 were used to validate the models. The fitting and prediction accuracy of the two models were evaluated by mean absolute error (MAE) and mean absolute percentage error (MAPE). Then, we forecasted the annual prevalence from 2014 to 2018, which was 55.8%, 53.5%, 54.0%, 52.9%, 51.2% by ARIMA model and 52.8%, 52.0%, 51.2%, 50.4%, 49.6% by GM. The declining trend in ECC prevalence may be attributed to the socioeconomic developments and improved public health service in China. In conclusion, both ARIMA and GM models can be well applied to forecast and analyze the trend of ECC; the fitting and testing errors generated by the ARIMA model were lower than those obtained from GM.

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Theory based interventions for caries related sugar intake in adults: systematic review.

**Source**

**Abstract**
BACKGROUND: Theories of behavior change are essential in the design of effective behaviour change strategies. No studies have assessed the effectiveness of interventions based on psychological theories to reduce sugar intake related to dental caries. The study assessed the effect of interventions based on Social Cognition Models (SCMs) on sugar intake in adults, when compared with educational interventions or no intervention.

**METHODS:** A range of papers were considered: Systematic review Systematic Reviews with or without Meta Analyses; Randomised Controlled Trials; Controlled Clinical Trials and Before and after studies, of interventions based on Social Cognition Models aimed at dietary intake of sugar in adults. The Cochrane database including: Oral Health Group’s Trials Register (2015), MEDLINE (from 1966 to September 2015), EMBASE (from 1980 to September 2015), PsycINFO (from 1966 to September 2015) were searched.
RESULTS: No article met the full eligibility criteria for the current systematic review so no articles were included.

CONCLUSION: There is a need for more clinical trials to assess the effectiveness of interventions based on psychological theory in reducing dietary sugar intake among adults.

SYSTEMATIC REVIEW PROTOCOL REGISTRATION: PROSPERO: CRD42015026357.

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Title
Role of fluoride varnish in preventing early childhood caries: A systematic review. [Review]

Source

Abstract
BACKGROUND: Early childhood caries is a public health problem that continues to affect babies and preschool children worldwide. This untreated caries process results in progressive destruction of the crowns of the teeth, often accompanied by severe pain and suffering, affecting the quality of life. Fluoride varnish which is one of the most important materials to prevent ECC is easy to apply and well tolerated by children. This study aimed to evaluate the scientific evidence regarding the role of fluoride varnish in preventing early childhood caries.

MATERIALS AND METHODS: Records were searched from various databases such as PubMed/Medline, Cochrane, and EMBASE. Articles published over the past 36 years (1979-2015) were identified using the key search terms. A total of 190 records were identified by title/abstracts/full text articles and were retrieved. Potentially relevant reports identified from the reference lists of relevant studies, review articles and chapters were hand-searched, which yielded an additional 10 articles. The main outcome of our investigation was prevention of early childhood caries following application of fluoride varnish and unavoidable fluoride exposure. Out of 190 articles originally identified, 30 records were considered potentially eligible and sought for further assessment. 17 articles met the inclusion criteria and these studies were assessed independently for methodology and performance.

RESULTS: Analysis of literature revealed that basically two concentrations of fluoride varnishes have been used: 1% and 5%, with a caries preventive fraction ranges of 6.4-30% and 5-63%, respectively.

CONCLUSION: The results showed that fluoride varnishes have been used at concentrations of 1% and 5% in the prevention of ECC. The preventive fraction was influenced by the frequency of application, the duration of study and sample size. The evidence level of the studies was of moderate to limited value.

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**Title**
Prevalence of dental caries and fluoride concentration of drinking water: A systematic review. [Review]

**Source**

**Abstract**
BACKGROUND: The objective of this study was to systematically review prevalence of dental caries at different water fluoride levels and emphasize fluoride concentration of drinking water and prevalence of dental caries.

MATERIALS AND METHODS: A comprehensive study was conducted using PubMed database. Inclusion criteria were predefined and some articles fulfilled these criteria. Study validity was assessed by some checklists. Surveys were conducted to determine prevalence of dental caries among individuals.

RESULTS: The heterogeneity in the group of children with deciduous teeth in terms of the amount of fluoride in drinking water and social class was significant, and the results of the studies in all the subgroups could not be pooled. However, the heterogeneity of group 2 for subjects with permanent teeth in terms of the fluoride level in drinking water and social class was not significant, and the results of the studies in each subgroup could be pooled together.

CONCLUSION: The meta-regression showed that tooth type and social class had a significant association with the difference in the prevalence of dental caries. Therefore, these variables were the sources of heterogeneity, and the studies must be grouped and subgrouped based on these variables.

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RECENT REVIEWS RELATED TO DENTAL CARIES

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Title
Are people with an orofacial cleft at a higher risk of dental caries? A systematic review and meta-analysis.

Abstract
Objective To establish whether children born with an orofacial cleft have a higher risk of dental caries than individuals without cleft.
Design A systematic review and meta-analysis
Methods The search strategy was based on the key words 'cleft lip palate' and 'oral hygiene caries decay'. Ten databases were searched from their inception to April 2016 to identify all relevant studies. All data were extracted by two independent reviewers.
The primary outcome measure was caries measured by the decayed, missing, filled surfaces/teeth index (dmfs/dmft or DMFS/DMFT).
Results Twenty-four studies met the selection criteria. All of the studies were observational. Twenty-two studies were suitable for inclusion in the meta-analysis. The overall pooled mean difference in dmft was 0.63 (95% CI: 0.47 to 0.79) and in DMFT was 0.28 (95% CI: 0.22 to 0.34).
Conclusion Individuals with cleft lip and/or palate have higher caries prevalence, both in the deciduous and the permanent dentitions.

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Do Oral Health Educational Programmes for Expectant Mothers Prevent Early Childhood Caries? - A Systematic Review.

PURPOSE: To summarise the evidence for the efficacy of oral health educational programmes provided to expectant mothers for preventing Early Childhood Caries (ECC) and to determine the most effective intervention programme.

MATERIALS AND METHODS: The search strategy included clinical trials in the Cochrane Oral Health Group's Trials Register, PubMed, Science Direct, Google Scholar, LILACS and ClinicalKey (up to 26 August 2013) in English. Reference lists of identified randomised controlled trials (RCTs) and review articles were also hand searched. Studies were selected according to predefined inclusion and exclusion criteria.

RESULTS: The search identified 392 studies, only four of which were included. Risk ratios (RR) were calculated. The quality of the evidence was assessed by the GRADE approach. Results showed statistically significant decreases in caries incidence (RR=0.18, 95% CI [from 0.06 to 0.52]) in one study. Meta-analysis could not be performed.

CONCLUSION: Oral health educational programmes for expectant mothers may have a positive impact in preventing ECC, although the evidence is weak.

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In-Process
Authors

Abstract

'The Colgate-Palmolive Company is extremely proud of the clinical program ... addition of 1.5% arginine to fluoride toothpaste.'


Abstract

For deep carious lesions, a more conservative treatment modality ('selective caries removal') has been proposed, where only the heavily contaminated dentine is removed. In this regard, effective adjuncts for cavity disinfection such as the antimicrobial photodynamic therapy (aPDT) can be valuable clinically prior to definitive restoration. Therefore, the aim of this study was to systematically assess clinical studies on the effectiveness of aPDT as a supplementary tool in the treatment of deep caries lesions. Searches were performed in four databases (PubMed, EMBASE, ISI Web of Science, ClinicalTrials.gov) from 1st January,
The pooled information was evaluated according to PRISMA guidelines. At first, 1651 articles were recovered, of which 1249 full-text articles were evaluated, 270 articles thereof were reviewed for eligibility and finally 6 articles met all inclusion criteria. The aPDT protocols involved Methylene Blue, Toluidine Blue and aluminium-chloride-phthalocyanine as photosensitizers and diode lasers, light-emitting diodes and halogen light-sources. The data from five reports, utilizing both culture-dependent and -independent methods, disclosed significant reduction of cariogenic bacterial load after mechanical caries removal with adjunct aPDT. As these studies exhibit some methodological limitations, e.g. lack of positive controls, this systematic review can support the application of aPDT to a limited extent only in terms of reducing the microbial load in deep carious lesions before restorative treatment.

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Title
Author's response to comment on "Accuracy of dental images for the diagnosis of dental caries and enamel defects in children and adolescents: A systematic review".
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Authors
Anonymous.
Title
Dental caries. [Review]
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20170525
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Abstract

This study aimed to evaluate the scientific evidence regarding the effectiveness of silver diamine fluoride (SDF) in preventing and arresting caries in the primary dentition and permanent first molars. A systematic review (SR) was performed by 2 independent reviewers using 3 electronic databases (PubMed, ScienceDirect, and Scopus). The database search employed the following key words: "topical fluorides" AND "children" AND "clinical trials"; "topical fluorides" OR "silver diamine fluoride" AND "randomized controlled trial"; "silver diamine fluoride" AND "children" OR "primary dentition" AND "tooth decay"; "silver diamine fluoride" OR "sodium fluoride varnish" AND "early childhood caries"; and "silver diamine fluoride" AND "children". Inclusion criteria were articles published in English, from 2005 to January 2016, on clinical studies using SDF as a treatment intervention to evaluate caries arrest in children with primary dentition and/or permanent first molars. Database searches provided 821 eligible publications, of which 33 met the inclusion criteria. After the abstracts were prescreened, 25 articles were dismissed based on exclusion criteria. The remaining 8 full-text articles were assessed for eligibility. Of these, 7 publications were included in the SR. These included 1 study assessing the effectiveness of SDF at different concentrations; 3 studies comparing SDF with other interventions; 2 investigations comparing SDF at different application frequencies and with other interventions; and 1 study comparing semiannual SDF applications versus a control group. The literature indicates that SDF is a preventive treatment for dental caries in community settings. At concentrations of 30% and 38%, SDF shows potential as an alternative treatment for caries arrest in the primary dentition and permanent first molars. To establish guidelines, more studies are needed to fully assess the effectiveness of SDF and to determine the appropriate application frequency.

OBJECTIVES: This systematic review and meta-analysis evaluated the association between developmental defects of enamel and dental caries in the primary dentition: A systematic review and meta-analysis. [Review] Source: Journal of Dentistry, 60:1-7, 2015 May.

Abstract

STUDY SELECTION: Observational studies that examined the association between developmental defects of enamel and dental caries in the deciduous dentition were included. Additionally, meta-analysis, funnel plots and sensitivity analysis were employed to synthesize the available evidence. Multivariable meta-regression analysis was performed to explore heterogeneity among studies.
CONCLUSIONS: This systematic review and meta-analysis demonstrates a clear association between developmental defects of enamel and dental caries in the primary dentition.
CURRENT EVIDENCE SUPPORTS NONINVASIVE/NONRESTORATIVE TREATMENT OF "EARLY" CARIOUS LESIONS; THOSE CONFINED TO ENAMEL OR REACHING THE ENAMEL-DETHIN JUNCTION. THE EXTENT THAT DENTISTS' THRESHOLDS FOR INTERVENING RESTORATIVELY HAVE CHANGED WITH THIS EVIDENCE IS UNKNOWN. THIS SYSTEMATIC REVIEW AIMED TO DETERMINE DENTISTS' AND THERAPISTS' CURRENT LESION THRESHOLD FOR CARIES INTERVENTIONS IN ADULTS/CHILDREN AND PRIMARY/PERMANENT TEETH. EMBASE, MEDLINE VIA PUBMED, AND WEB OF SCIENCE WERE SEARCHED FOR OBSERVATIONAL STUDIES, WITHOUT LANGUAGE, TIME, OR QUALITY RESTRICTIONS. SCREENING AND DATA EXTRACTION WERE INDEPENDENT AND IN DUPLICATE. RANDOM-EFFECTS META-ANALYSES WITH SUBGROUP AND META-REGRESSION ANALYSIS WERE PERFORMED. THIRTY STUDIES, MAINLY INVOLVING DENTISTS, MET THE INCLUSION CRITERIA. THERE WAS HETEROGENEITY IN SAMPLING FRAMES, METHODS, AND SCALES USED TO INVESTIGATE THRESHOLDS. THE STUDIES SPANNED 30 Y (1983-2014), AND SAMPLE REPRESENTATIVENESS AND RESPONSE BIAS ISSUES WERE LIKELY TO HAVE AFFECTED THE RESULTS. STUDIES MEASURED WHAT DENTISTS SAID THEY WOULD DO RATHER THAN ACTUALLY DO. STUDIES REPRESENTED 17 COUNTRIES, FOCUSING MAINLY ON ADULTS (N = 17) AND PERMANENT TEETH (N = 24). FOR PROXIMAL CARIOUS LESIONS CONFINED TO ENAMEL (NOT REACHING THE ENAMEL-DETHIN JUNCTION), 21% (95% CONFIDENCE INTERVAL [CI], 15%-28%) OF DENTISTS/THERAPISTS WOULD INTERVENE INVASIVELY. THE LIKELIHOOD OF A RESTORATIVE INTERVENTION ALMOST DOUBLED (RISK RATIO, 1.98; 95% CI, 1.68-2.33) IN HIGH-CARIES RISK PATIENTS. FOR PROXIMAL LESIONS EXTENDING UP TO THE ENAMEL-DETHIN JUNCTION, 48% (95% CI, 40%-56%) OF DENTISTS/THERAPISTS WOULD INTERVENE RESTORATIVELY. FOR OCCLUSAL LESIONS WITH ENAMEL DISCOLORATION/CAVITATION BUT NO CLINICAL/RADIOGRAPHIC DENTIN INVOLVEMENT, 12% (95% CI, 6%-22%) OF DENTISTS/THERAPISTS STATED THEY WOULD INTERVENE, INCREASING TO 74% (95% CI, 56%-86%) WITH DENTIN INVOLVEMENT. THERE WAS VARIANCE BETWEEN COUNTIES BUT NO SIGNIFICANT TEMPORAL TREND. A SIGNIFICANT PROPORTION OF DENTISTS/THERAPISTS SAID THEY WOULD INTERVENE INVASIVELY (RESTORATIVELY) ON CARIOUS LESIONS WHERE EVIDENCE AND CLINICAL RECOMMENDATIONS INDICATE LESS INVASIVE THERAPIES SHOULD BE USED. THERE IS GREAT NEED TO UNDERSTAND DECISIONS TO INTERVENE RESTORATIVELY AND TO FIND IMPLEMENTATION INTERVENTIONS THAT TRANSLATE RESEARCH EVIDENCE INTO CLINICAL PRACTICE.

METHODS: MEDLINE VIA PUBMED, WEB OF SCIENCE, AND COCHRANE CENTRAL REGISTER OF CONTROLLED TRIALS (CENTRAL) WERE SEARCHED FROM JANUARY 1, 1995 THROUGH SEPTEMBER 26, 2016 FOR RANDOMIZED AND CONTROLLED TRIALS ON CHILDREN CONSUMING XYLITOL FOR AT LEAST 12 MONTHS. THE PRIMARY ENDPOINT WAS CARIES REDUCTION MEASURED BY MEAN DECAYED, MISSING, AND FILLED PRIMARY AND DEPTH.
permanent surfaces/teeth (dmfs/t, DMFS/T, respectively). The I² and chi-square test for heterogeneity were used to detect trial heterogeneity. Meta-analyses were performed and quality was evaluated using GRADE profiler software.

RESULTS: Analysis of five randomized controlled trials (RCTs) showed that xylitol had a small effect on reducing dental caries (standardized mean difference [SMD] equals -0.24; 95 percent confidence interval [CI] equals -0.48 to 0.01; P = 0.06) with a very low quality of evidence and considerable heterogeneity. Studies with higher xylitol doses (greater than four grams per day) demonstrated a medium caries reduction (SMD equals -0.54; 95 percent CI equals -1.14 to 0.05; P = 0.07), with these studies also having considerable heterogeneity and very low quality of evidence.

CONCLUSIONS: The present systematic review examining the effectiveness of xylitol on caries incidence in children showed a small effect size in randomized controlled trials and a very low quality of evidence that makes preventive action of xylitol uncertain.

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Title
The history of public health use of fluorides in caries prevention.
Source
Zdravstveno Varstvo. 56(2):140-146, 2017 Jun 01.
Abstract
AIM: The aim of our study was to chronologically analyse various public health measures of fluoride use in caries prevention.
METHODS: We systematically searched the PubMed database on the preventive role of fluorides in public health, published from 1984 to 2014. The search process was divided into four steps, where inclusion and exclusion criteria were defined. Qualitative methodology was used for the article analysis. In the research process, the described forms of F use, diversity of the described F agents, and the observed population group were analysed.
RESULTS: In our systematic review, 40 relevant reviews were revealed. Fluorides have been used in many different forms, but only a few studies showed their significant role in public health. Water fluoridation was the most important public health measure. In the recent decades, the number of studies on topical fluorides is constantly rising. The most extensively described topical forms of fluorides are professionally applied fluoride agents and fluoride toothpaste for home-use. The use of fluoride containing toothpaste in caries prevention is a safe and successful public health measure (PHM) if their use is widespread, and it is recommended for all. The results on other topical forms of fluorides are insufficient to be suggested as an important PHM.
CONCLUSIONS: The role of fluorides in public health prevention has changed in accordance with the knowledge about the fluoride cariostatic mechanism. Previously the most important pre-eruptive effect of fluorides was supplemented by the post eruptive effect. Abundant evidence exists to show the effectiveness of systemic and topical fluorides.
Other Abstract
Publisher: Namen nase raziskave je bil kronolosko analizirati razlicne nacine javnozdravstvene uporabe fluoridov pri preventivni kariesa.; Language: Slovene
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Gingival recession and root caries in the ageing population: a critical evaluation of treatments.

AIM: To review evidence for the treatments of gingival recession and root caries in older populations.

MATERIALS & METHODS: A systematic approach was adopted to identify reviews and articles to allow us to evaluate the treatments for gingival recession and root caries. Searches were performed in PubMed, Medline and Embase, the Cochrane trials register and bibliographies of European and World Workshops.

OBSERVATIONS: Gingival recession: We identified no articles that focussed specifically on older populations. Conversely, no evidence suggested that Miller class I and II lesions should be managed differently in older patients when compared to younger cohorts. Six systematic reviews included older patients and suggested that connective tissue grafts are the treatment of choice, alone or in combination with enamel matrix derivative. Root caries can be controlled at the population level by daily brushing with fluoride-containing toothpastes, whilst active decay may be inactivated using professional application of fluoride varnishes/solutions or self-applied high-fluoride toothpaste. Active root caries lesions that cannot be cleaned properly by the patient may be restored by minimally invasive techniques.

CONCLUSIONS: Gingival recession and root caries will become more prevalent as patients retain their teeth for longer. Whilst surgical (gingival recession) and non-operative approaches (root caries) currently appear to be favoured, more evidence is needed to identify the most appropriate strategies for older people.

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Title: Nutrition, dental caries and periodontal disease: a narrative review.


Abstract

AIM: To provide a narrative review of the role of macronutrients and micronutrients in relation to dental caries, gingival bleeding and destructive periodontal disease.

MATERIALS & METHODS: This review is based on systematic reviews (when available) and comparative human studies.

RESULTS: Dental caries cannot develop without the presence of dietary fermentable carbohydrates, in particular sugar. The susceptibility to develop caries in the presence of carbohydrates may be influenced by genetics and micronutrients such as vitamin D. Gingival bleeding and destructive periodontal disease are sensitive markers to both abnormalities in macronutrient content (excessive carbohydrates or poly-unsaturated fat intake, deficient protein intake) and micronutrient intake (e.g. vitamin C and B12).

CONCLUSION: Dental caries and periodontal diseases are a sensitive alarm bell for an unhealthy diet, which predicts the future onset of the diseases of civilizations.

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Title: Global epidemiology of dental caries and severe periodontitis - a comprehensive review.


Abstract

BACKGROUND: Dental caries and periodontitis are the most common oral diseases and major causes of tooth loss.

AIM: To perform a review of global prevalence and incidence of dental caries and periodontitis.

METHODOLOGY: Inclusion and exclusion criteria were developed. MEDLINE database and EMBASE database were used to search for eligible publications using keywords and MeSH terms. Additionally, WHO databank was used for obtaining dental caries information and PUBMED for a search on trends of dental caries prevalence and severity.

RESULTS: Over the last four decades, the prevalence and severity of dentine carious lesions among 5- and 12-year-olds have declined: the decay-component is very high, with the lowest prevalence among 12-year-olds in high-income countries, which also had the lowest prevalence among 35- to 44-year-olds; and the number of retained teeth has increased around the globe. The prevalence of periodontitis is high, with approximately 10% of the global population affected by severe periodontitis. Study heterogeneity and methodological issues hamper comparisons across studies and over time.

CONCLUSION: While the prevalence of dental caries has decreased, the disease is prevalent in all age groups. The prevalence of periodontitis is high. There is insufficient evidence to conclude that the prevalence of periodontitis has changed over time.
Socio-behavioural aspects in the prevention and control of dental caries and periodontal diseases at an individual and population level.

MATERIAL & METHODS: With regard to caries, MEDLINE/PubMed was searched on three subheadings focusing on early childhood, proximal and root caries. For periodontal diseases, a meta-review on systematic reviews was performed; thus, the search strategy included specific interventions to change behaviour in order to perform a meta-review on systematic reviews. After extraction of data and conclusions, the potential risk of bias was estimated and the emerging evidence was graded.

RESULTS: Regarding early childhood, proximal and root caries, 28, 6 and 0 papers, respectively, could be included, which predominantly reported on cohort studies. Regarding periodontal diseases, five systematic reviews were included. High evidence of mostly high magnitude was retrieved for behavioural interventions in early childhood caries (ECC), weak evidence for a small effect in proximal caries and an unclear effect of specific informational/motivational programmes on prevention of periodontal diseases and no evidence of root caries.

CONCLUSION: Early childhood caries can be successfully prevented by population-based preventive programmes via aiming at the change in behaviour. The effect of individual specific motivational/informational interventions has not yet been clearly demonstrated neither for the prevention of caries nor for periodontal diseases.
AIM: To systematically appraise the scientific literature to identify potential risk factors for caries and periodontal diseases.

METHODS: One systematic review (genetic risk factors), one narrative review (role of diet and nutrition) and reference documentation for modifiable acquired risk factors common to both disease groups, formed the basis of the review. It is important to consider patients with diabetes, optimally controlled diabetes and obesity are at increased risk for periodontitis.

RESULTS & CONCLUSIONS: There is moderately strong evidence for a genetic contribution to periodontal diseases and caries susceptibility, with an attributable risk estimated to be up to 50%. The genetics literature for periodontal disease is more substantial than for caries and genes associated with chronic periodontitis are the vitamin D receptor (VDR), Fc gamma receptor IIA (Fc-gammaRIIA) and Interleukin 10 (IL10) genes. For caries, genes involved in enamel formation (AMELX, AMBN, ENAM, KIAA20, and KLK4), salivary characteristics (AQP5), immune regulation and dietary preferences had the largest impact. No common genetic variants were found. Fermentable carbohydrates (sugars and starches) were the most relevant common dietary carbohydrate intake. Identification of these factors is crucial in the prevention of both diseases as well as in their management.

Abstract

Periodontal diseases and dental caries are the most common diseases of humans and the main cause of tooth loss. Both diseases can lead to nutritional compromise and negative impacts upon self-esteem and quality of life. As complex chronic diseases, they share common risk factors, such as a requirement for a pathogenic plaque biofilm, yet they exhibit distinct pathophysologies. Multiple exposures contribute to their causal pathways, and susceptibility involves risk factors that are inherited (e.g. genetic variants), and those that are acquired (e.g. socio-economic factors, biofilm load or composition, smoking, carbohydrate intake). Identification of these factors is crucial in the prevention of both diseases as well as in their management.

AIM: To systematically appraise the scientific literature to identify potential risk factors for caries and periodontal diseases.

METHODS: One systematic review (genetic risk factors), one narrative review (role of diet and nutrition) and reference documentation for modifiable acquired risk factors common to both disease groups, formed the basis of the report.

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AIM: To report the evidence on the effect of mechanical and/or chemical plaque control in the simultaneous management of gingivitis and caries.

MATERIAL AND METHODS: A protocol was designed to identify randomized (RCTs) and controlled (CCTs) clinical trials, cohort studies and prospective case series (PCS), with at least 6 months of follow-up, reporting on plaque, gingivitis and caries. Relevant information was extracted from full papers, including quality and risk of bias. Meta-analyses were performed whenever possible.

RESULTS: After the screening of 1,373 titles, 15 RCTs, 10 CCTs and 2 PCS were included. Low to moderate evidence support that combined professional and self-performed mechanical plaque control significantly reduces standardized plaque index \([n = 4; \text{WMD} = 1.294; 95\% \text{CI} (0.445; 2.144); p = 0.003]\) and gingivitis scores \([n = 4; \text{WMD} = 1.728; 95\% \text{CI (0.631; 2.825); p = 0.002}]\). The addition of fluoride to mechanical plaque control is relevant for caries management \([n = 5; \text{WMD} = 1.159; 95\% \text{CI (0.145; 2.172); p = 0.025}]\) while chlorhexidine rinses are relevant for gingivitis.

CONCLUSION: Mechanical plaque control procedures are effective in reducing plaque and gingivitis. The addition of fluoride to mechanical plaque control is significant for caries management. Chlorhexidine rinse has a positive effect on gingivitis and inconclusive role in caries.
Title
Age-related changes in immune function (immune senescence) in caries and periodontal diseases: a systematic review.

Source

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Abstract
AIM: To systematically review the evidence regarding immune senescence in the pathogenesis of periodontitis and dental caries.

METHODS: A systematic search of electronic databases utilizing medical subject headings (MeSH terms) supplemented by screening of review articles and other relevant texts was undertaken.

RESULTS: Seventy-three articles were included (43 for periodontitis, 30 for caries). Study results were found to be generally heterogeneous. Regarding periodontitis, human studies suggest evidence for altered neutrophil function and increased production of pro-inflammatory mediators (e.g. interleukin-1beta, interleukin-6 and prostaglandin E<sub>2</sub>) in older compared to younger subjects, and animal experiments suggest increased expression of genes that contribute to a pro-inflammatory state in older compared to younger animals. Regarding dental caries, research relating to changes in immune functioning and the impact of ageing is in its infancy. A small number of studies have reported components of innate and adaptive immunity that affect the composition of saliva and dental biofilms with possible impacts on caries progression.

CONCLUSION: There is evidence that immune functioning related to periodontitis and (less investigated) dental caries alters with increasing age. In both conditions, age-associated mechanistic changes in immune functioning are complex and incompletely understood and it is not clear how these relate to disease susceptibility.
CONCLUSIONS: Despite some potential aetiopathogenic similarities between periodontitis and caries, no genetic variants to date have clearly been associated with both diseases. Further studies or comparisons across studies with large sample size and clear phenotype definition could shed light into possible shared genetic risk factors for caries and periodontitis.

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Xylitol in preventing dental caries: A systematic review and meta-analyses. [Review]

Abstract
Xylitol is a sugar alcohol having the properties that reduce levels of mutans streptococci (MS) in the plaque and saliva. To assess the role of xylitol in preventing dental caries. Systematic review and meta-analysis developed by Cochrane cooperation were adapted. Electronic search was carried out in PubMed through the period up to 2014. Included clinical studies were done on (1) humans (2) participants include both individuals and as pairs (mother-child) (3) participants using orthodontic appliances (4) xylitol dispensed in any form (5) compare the effect of xylitol on dental caries and on other phenotype that determines the preventive effect on dental caries, such as decayed, missing, and filled (DMF/dmf) and salivary or plaque MS level. Twenty articles of the 477 articles initially identified. Among 20 studies indexed, 16 articles were accessed, systematically reviewed, and the meta-analysis was carried out. The evaluation of quality of the studies was done using risk of bias assessment tool. The quality of the studies was high risk and unclear risk for six and five trials. The meta-analysis shows a reduction in DMF/dmf with the standard mean (SM) of -1.09 (95% confidence interval [95% CI], -1.34, -0.83) comparing xylitol to all controls. The effect of DMF/dmf reduction by xylitol to fluoride varnish was with the SM of -1.87 (95% CI, -2.89, -0.84). The subgroup analysis, there was a reduction in MS count with SM of 0.30 (95% CI, 0.05, 0.56) when compared with all other caries preventive strategies; however, it was insignificant. Xylitol was found to be an effective strategy as self-applied caries preventive agent.
studies were selected. In this meta-analysis of 397 clinical research studies about the effects of pit and fissure sealants on dental caries in permanent molars of children in China.

**Abstract**

**Title**
Is caries a risk factor for dental trauma? A systematic review and meta-analysis. [Review]

**Source**

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**Abstract**

**BACKGROUND/AIM:** The association between trauma and caries is still controversial in the literature. The aim of this study was to evaluate the possible association between caries and dental trauma through a systematic review with meta-analysis.

**DESIGN:** A systematic literature search was performed in PubMed, Lilacs, BBO, Scopus, Web of Science, Cochrane Library, and Open Grey databases. The MeSH terms used were 'Tooth injuries', 'Tooth fractures', 'Tooth avulsion', 'Tooth movement'; 'Dental caries'; 'DMF index'; and 'Tooth demineralization'. MeSH synonyms, related terms, and free terms were included. The inclusion criteria comprised clinical investigations of subjects with and without caries that had suffered dental trauma. Quality assessment and bias control were carried out. Meta-analysis was performed using the comprehensive meta-analysis software (version 3.2). Heterogeneity was assessed using the I² index, and the odds ratio was also calculated (P < 0.05).

**RESULTS:** From 1290 abstracts, seven met the inclusion criteria. All studies had high methodological quality and five were included in the meta-analysis. The results demonstrated a positive association (P < 0.001) between dental trauma and dental caries in permanent teeth [OR: 1.490, 95%, CI: 1.209-1.835]. However, for children with primary teeth, the results showed a negative association (P = 0.006) between dental trauma and caries [OR: 0.706, 95%, CI: 0.550-0.906].

**CONCLUSIONS:** The results demonstrated positive and negative association between the presence of caries and dental trauma in permanent and primary teeth, respectively.

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**Title**
Systemic review of the prevention of pit and fissure caries of permanent molars by resin sealants in children in China.

**Source**

**Abstract**

**AIM:** The aim of the present study was to evaluate the relationship between pit and fissure sealants and the prevention of dental caries in permanent molars of children in China.

**METHODS:** The Cochrane Handbook for Systematic Reviews of Interventions was followed. Articles published in English and Chinese from 2002 to 2013 were selected. All these studies were randomized clinical trials related to pit and fissure sealants on caries prevention. Data were analyzed using Software Review Manager 5.1.

**RESULTS:** A search of the four largest Chinese medical literature databases and the PubMed/Medline database yielded a total of 397 clinical research studies about the effects of pit and fissure sealants on the prevention of dental caries; 20 original research studies were selected. In this meta-analysis, a total of 12 187 participants were included. Statistical analyses demonstrated a
significant association between pit and fissure sealants and dental caries prevention for a 6-month follow-up period (combined odds ratio = 0.06, 95% CI: 0.01, 0.32, P < 0.0001). For other follow ups, there was a trend in pit and fissure sealants preventing the occurrence of dental caries.

CONCLUSION: Current clinical evidence suggests that pit and fissure sealants are effective for dental caries prevention. Sealants should be placed as part of an overall caries prevention approach. Further research with larger sample sizes and rigorously-designed clinical trials are required to corroborate the current results.

Potential applications of antimicrobial peptides and their mimics in combating caries and pulpal infections. [Review]

Antimicrobial peptides (AMPs) are short cationic host-defense molecules that provide the early stage of protection against invading microbes. They also have important modulatory roles and act as a bridge between innate and acquired immunity. The types and functions of oral AMPs were reviewed and experimental reports on the use of natural AMPs and their synthetic mimics in caries and pulp infections were discussed. Natural AMPs in the oral cavity, predominantly defensins, cathelicidins and histatins, possess antimicrobial activities against oral pathogens and biofilms. Incomplete debridement of microorganisms in the root canal space may precipitate an exacerbated immune response that results in periapical bone resorption. Because of their immunomodulatory and wound healing potentials, AMPs stimulate pro-inflammatory cytokine production, recruit host defense cells and regulate immuno-inflammatory responses in the vicinity of the pulp and periapex. Recent rapid advances in the development of synthetic AMP mimics offer exciting opportunities for new therapeutic initiatives in root canal treatment and regenerative endodontics.

STATEMENT OF SIGNIFICANCE: Identification of new therapeutic strategies to combat antibiotic-resistant pathogens and biofilm-associated infections continues to be one of the major challenges in modern medicine. Despite the presence of commercialization hurdles and scientific challenges, interests in using antimicrobial peptides as therapeutic alternatives and adjuvants to combat pathogenic biofilms have never been foreshortened. Not only do these cationic peptides possess rapid killing ability, their multi-modal mechanisms of action render them advantageous in targeting different biofilm sub-populations. These factors, together with adjunctive bioactive functions such as immunomodulation and wound healing enhancement, render AMPs or their synthetic mimics exciting candidates to be considered as adjuncts in the treatment of caries, infected pulps and root canals.
Introduction: With a growing number of individuals retaining their teeth lifelong, often with periodontitis-induced root surface exposure, there is the need for cost-effective management strategies for root caries lesions. The present study aimed to assess the cost-effectiveness of root caries preventive treatments.

Methods: Patients were simulated over 10 years using a Markov model. Four treatments were compared: No treatment, daily 225–800ppm fluoride rinses, chlorhexidine (CHX) varnish (2x/year), silver diamine fluoride (SDF) varnish (2x/year). Data from a systematic review were submitted to network meta-analysis for inferring relative efficacies of treatments. The health outcome was years of teeth being free of root caries. A mixed public-private payer perspective within 2016 German healthcare was taken, with costs being estimated from fee item catalogues or based on market prices. Populations with different numbers of teeth and tooth-level risks were modelled. Monte-Carlo microsimulations, univariate- and probabilistic sensitivity analyses were performed.

Results: In populations with 16 teeth at risk and low tooth-level risk for root caries, providing no preventive treatment was least costly, but also least effective (130 Euro, 144 years). SDF ranked next, being more costly (180 Euro), but also more effective (151 years). Payers willing to invest 3.30 Euro per root caries-free tooth-year found SDF most cost-effective. CHX varnish and fluoride rinse were not cost-effective. In populations with more teeth and high tooth-level risk, SDF was the most effective and least costly option.

Conclusions: Root caries preventive treatments (like SDF) are effective and might even be cost-saving in high risk populations.

Clinical significance: Application of SDF can be recommended as a cost-saving treatment for prevention of root caries in patients with high risk of root caries.
OBJECTIVES: The risk of ‘caries adjacent to restorations’ (CAR) might depend on the used restorative materials. In situ studies are often used to compare the risk of caries adjacent to different materials. We aimed to review in situ studies to evaluate how different materials contribute to risk of CAR.

DATA SOURCES: We included in situ controlled trials comparing directly placed restorative materials, reporting on caries (mineral loss, measured via radiography or micro-hardness) adjacent to these materials. Medline, Embase and Cochrane CENTRAL were systematically searched. Screening and data extraction was performed independently by two authors. Materials were classified according to the used adhesive and restorative materials. Fixed-effects pairwise and frequentistic network meta-analyses were performed STUDY SELECTION: Nine studies (132 patients, 8 materials) were included, yielding inconsistent results. We could not identify underlying reasons, as confounders were only limitedly reported. The resulting material rankings come with great uncertainty, and raise doubts as to the validity and transferability of in situ studies as well as the applicability of their findings.

CONCLUSIONS: The current body of evidence of in situ studies is insufficient for firm conclusions as to the caries risk adjacent to different materials. The validity and applicability of included studies remain uncertain.

CLINICAL SIGNIFICANCE: While single in situ studies seem to convey consistent and applicable information, the overall body of evidence is inconsistent, limiting the conclusions which can be drawn from it.

BACKGROUND: Molar incisor hypomineralization (MIH) is a defect of enamel. The lower strength of the enamel can lead to fractures that predispose for plaque accumulation and caries.

AIM: This systematic review aimed to assess the association between MIH and caries.

DESIGN: Studies involving children of all ages, which reported results on MIH and caries in the permanent dentition, were considered eligible. A search was performed in PubMed and was limited to the period from January 2003 to November 2015, and to studies written in English. Reviews, meta-analyses, and case reports were excluded. The studies were evaluated by use of the Newcastle-Ottawa Quality Assessment Scale (NOS).

RESULTS: Seventeen publications were compiled in the review. Most publications reported that children with MIH have higher caries experience. One study did not observe a difference in DMF values among children affected or not by MIH. Three studies reported that children with MIH were 2.1 to 4.6 times more likely to have caries in the permanent dentition than children without MIH.

CONCLUSIONS: A significant association between MIH and caries was found. The results should, however, be interpreted cautiously due to the lack of high-quality studies. The present systematic review confirms the need for further well-designed studies.
Interventions for orthodontically induced white spot lesions: a systematic review and meta-analysis. [Review]

**Title**

Background: Although orthodontic white spot lesions (WSLs) are one of the most often and most evident adverse effects of comprehensive fixed appliance treatment, the efficacy of interventions for WSLs has not yet been adequately assessed in an evidence-based manner.

**Objective:** Aim of this systematic review was to assess the therapeutic and adverse effects of interventions to treat post-orthodontic WSLs from randomized trials in human patients.

**Search methods:** An unrestricted electronic search of eight databases from inception to May 2016.

**Selection criteria:** Randomized controlled trials assessing any interventions for post-orthodontic WSLs on human patients.

**Data collection and analysis:** After duplicate study selection, data extraction, and risk of bias assessment according to the Cochrane guidelines, random-effects meta-analyses of mean differences (MDs), standardized mean differences (SMDs), and odds ratios (ORs), including their 95% confidence intervals (CIs) were performed, followed by subgroup and sensitivity analyses.

**Results:** A total of 20 unique studies and a total of 942 (42 per cent male and 58% per cent female) patients were included, with an average age of 16.2 years and a mean number of 8.2 WSLs (range 2.2 to 45.4) per patient. These were allocated to adjunct treatment with casein phosphopeptide-stabilized amorphous calcium phosphate creams, external tooth bleaching, low- or high-concentration fluoride films, gels, mouthrinses or varnishes, resin infiltration, miswak chewing sticks, bioactive glass toothpaste, or to no adjunct treatment (i.e. conventional oral hygiene). The monthly use of fluoride varnish was the best supplement to improve WSLs in terms of lesion area (1 trial; MD = -0.80 mm²; 95% CI = -1.10, -0.50 mm²; P < 0.05; high quality) and enamel fluorescence (3 trials; SMD = -0.92; 95% CI = -1.32, -0.52; P < 0.05; high quality), followed by the use of fluoride film. WSL treatment did not provide a considerable improvement in their clinical evaluation (3 trials; OR = 0.97; 95% CI = 0.60, 1.56; P > 0.05; moderate quality), with imprecision due to small sample size being the main limitation of existing evidence.

**Conclusions:** Based on the existing trials, interventions for post-orthodontic WSLs, mainly fluoride varnish, seem to be effective, but further research is needed to elucidate their clinical relevance.

**Registration:** PROSPERO (CRD42016037538).

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**Source**

Management of post-orthodontic white spot lesions: an updated systematic review. [Review]

**Title**
Management of post-orthodontic white spot lesions: an updated systematic review. [Review]

**Source**

**Abstract**
Background/objectives: The management of post-orthodontic white spot lesions is based on remineralization strategies or a minimal-invasive camouflage of the lesions.

Aim: The aim of this systematic review was to identify and assess the quality of evidence for the various clinical technologies.

Search methods: Four databases were searched for relevant literature published in English between 2011 and 31 October 2015 according to a predetermined PICO. Only controlled clinical studies were considered. Abstract lists and the selected full-text papers were independently examined by two reviewers and any differences were solved in consensus. The Cochrane handbook and the AMSTAR tool were used for grading the risk of bias. The quality of evidence was rated according to GRADE.

Results: Out of 280 identified publications, seven studies on remineralization, micro-abrasion and resin infiltration met the inclusion criteria. Two of them were assessed with low risk of bias. No pooling of results was possible due to study heterogeneity. The quality of evidence for all technologies was graded as very low.

Limitations: Only papers published in English with more than 20 adolescents or young adults were considered. Furthermore, a follow-up period of at least 8 weeks was required. The publication bias could not be assessed due to the paucity of included trials.

Conclusions/clinical implications: There is a lack of reliable scientific evidence to support remineralizing or camouflaging strategies to manage post-orthodontic white spot lesions. Further well-performed controlled clinical trials with long-term follow-up are needed to establish best clinical practice.

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**Title**
Dental caries. [Review]

**Source**

**Abstract**
Dental caries is a biofilm-mediated, sugar-driven, multifactorial, dynamic disease that results in the phasic demineralization and remineralization of dental hard tissues. Caries can occur throughout life, both in primary and permanent dentitions, and can
damage the tooth crown and, in later life, exposed root surfaces. The balance between pathological and protective factors influences the initiation and progression of caries. This interplay between factors underpins the classification of individuals and groups into caries risk categories, allowing an increasingly tailored approach to care. Dental caries is an unevenly distributed, preventable disease with considerable economic and quality-of-life burdens. The daily use of fluoride toothpaste is seen as the main reason for the overall decline of caries worldwide over recent decades. This Primer aims to provide a global overview of caries, acknowledging the historical era dominated by restoration of tooth decay by surgical means, but focuses on current, progressive and more holistic long-term, patient-centred, tooth-preserving preventive care.

### Abstract

Early childhood caries (ECC) is one of the most prevalent infectious diseases affecting children worldwide. ECC is an aggressive form of dental caries, which, left untreated, can result in rapid and extensive cavitation in teeth (rampant caries) that is painful and costly to treat. Furthermore, it affects mostly children from impoverished backgrounds, and so constitutes a major challenge in public health. The disease is a prime example of the consequences arising from complex, dynamic interactions between microorganisms, host, and diet, leading to the establishment of highly pathogenic (cariogenic) biofilms. To date, there are no effective methods to identify those at risk of developing ECC or to control the disease in affected children. Recent advances in deep-sequencing technologies, novel imaging methods, and (meta)proteomics-metabolomics approaches provide an unparalleled potential to reveal new insights to illuminate our current understanding about the etiology and pathogenesis of the disease. In this concise review, we provide a broader perspective about the etiology and pathogenesis of ECC based on previous and current knowledge on biofilm matrix, microbial diversity, and host–microbe interactions, which could have direct implications for developing new approaches for improved risk assessment and prevention of this devastating and costly childhood health condition.
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Title
Salivary protein polymorphisms and risk of dental caries: a systematic review. [Review]
Source
Pesquisa Odontologica Brasileira = Brazilian Oral Research. 31:e41, 2017 Jun 05.
Abstract
Dental caries is an oral pathology associated with both lifestyle and genetic factors. The caries process can be influenced by salivary composition, which includes ions and proteins. Studies have described associations between salivary protein polymorphisms and dental caries experience, while others have shown no association with salivary proteins genetic variability. The aim of this study is to assess the influence of salivary protein polymorphisms on the risk of dental caries by means of a systematic review of the current literature. An electronic search was performed in PubMed, Scopus, and Virtual Health Library. The following search terms were used: “dental caries susceptibility,” “dental caries,” ”polymorphism, genetics,” “saliva,” ”proteins,” and “peptides.” Related MeSH headings and free terms were included. The inclusion criteria comprised clinical investigations of subjects with and without caries. After application of these eligibility criteria, the selected articles were qualified by assessing their methodological quality. Initially, 338 articles were identified from the electronic databases after exclusion of duplicates. Exclusion criteria eliminated 322 articles, and 16 remained for evaluation. Eleven articles found a consistent association between salivary protein polymorphisms and risk of dental caries, for proteins related to antimicrobial activity (beta defensin 1 and lysozyme-like protein), pH control (carbonic anhydrase VI), and bacterial colonization/adhesion (lactotransferrin, mucin, and proline-rich protein Db). This systematic review demonstrated an association between genetic polymorphisms and risk of dental caries for most of the salivary proteins.

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Title
Models of Caries Formation around Dental Composite Restorations. [Review]
Source
Local Messages
THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY, TO REQUEST THIS ARTICLE FROM THE LIBRARY GO TO:
Abstract
The main reason cited for the replacement of dental composite restorations is the recurrence of caries. Numerous models—both in vitro, with acid gels or bacterial biofilms, and in situ, with dental appliances—have been used to study caries formation around dental composites. The literature shows that many factors may affect caries formation, including marginal gap formation, gap size, the local chemical environment, the durability of the bonded interface, the extent of bacterial penetration, and the presence of mechanical loading. Studies have also shown that what have been called wall lesions may form independent of surface lesions, though not likely due to microleakage through very small gap spaces in the clinical situation. Gap size and mechanical loading have been shown to be related to lesion severity within in vitro models, but these results do not correspond exactly with those obtained from in situ studies using restorations in dental appliances. Though not conclusive, some in vitro models have shown that certain materials possessing antimicrobial characteristics may reduce the severity of lesion formation, suggesting possible pathways for developing new composite and adhesive materials for restorations with potentially enhanced longevity.
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**RECENT REVIEWS RELATED TO DENTAL CARIES**

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**Title**
Sustained-release drug delivery of antimicrobials in controlling of supragingival oral biofilms. [Review]

**Source**

**Abstract**
INTRODUCTION: Dental caries, a bacterial biofilm-associated disease, is a prevalent oral health problem. It is a bacterial biofilm-associated disease. Conventional means of combating this disease involves oral hygiene, mostly tooth brushing. Supplementary means of prevention and treatment is often necessary. The use of sustained-release delivery systems, locally applied to the oral cavity appears to be one of the most acceptable avenues for the delivery of antimicrobial agents. Area covered: The development and current approaches of local sustained delivery technologies applied to the oral cavity for treatment and prevention of dental caries is discussed. The use of polymeric drug delivery systems, varnishes, liposomes and nanoparticles is presented. Expert opinion: The use of local sustained-release delivery systems applied to the oral cavity has numerous clinical, pharmacological and toxicological advantages over conventional means. Various sustained-release technologies have been suggested over the course of several years. The current research on oral diseases concentrates predominantly on improving the drug delivery. With progress in pharmaceutical technology, sophisticated controlled-release platforms are being developed. The sustained release concept is innovative and there are few products available for the benefit of all populations. Harmonizing academic research with the dental industry will surely expedite the development and commercialization of more products of such pharmacological nature.

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**Title**
Dental caries and quality of life of preschool children: discriminant validity of the ECOHIS. [Review]

**Source**
Pesquisa Odontologica Brasileira = Brazilian Oral Research. 31(0):e24, 2017 Mar 30.

**Abstract**
The aim of the present study was to confirm the discriminant validity (obtained using traditional statistical methods) of the Early Childhood Oral Health Impact Scale (ECOHIS) between preschool children with and without caries (mean score) through an evaluation of the effect size. A systematic search of electronic databases and a manual search were performed for studies published up to December 2015 involving the use of the ECOHIS for the evaluation of the impact of dental caries on oral health-related quality of life (OHRQoL) among preschool children. Two independent raters performed the selection of the studies and data extraction. Only papers published in English and Spanish were selected. No restrictions were imposed regarding the year of publication. Twelve studies were included, and the magnitude of standardized differences between the means of the “without caries” and “with caries” groups was calculated using Cohen's d. Most studies demonstrated a large magnitude in the difference between the groups evaluated. The estimate of the effect size confirmed the discriminant validity of the ECOHIS obtained through traditional statistics. Thus, the magnitude of the difference should be considered an important analytical tool for the confirmation of statistical findings regarding null hypotheses and demonstrates the clinical significance of these research results.

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**Authors**
Based on single studies, it has been hypothesised that Europeans have suffered less frequently from caries before the 18th century than after the 18th century and that females have higher caries prevalence, but systematic European-wide overviews are sparse. We collected published data on dental diseases (publication between 1981 and 2015 with reports on 29 cohorts with 4998 individuals and a total of 85817 teeth). Meta-analyses revealed that, over several hundred years, including the post-18th century era, Europeans had relatively constant frequencies of caries and ante-mortem tooth loss, but since the 18th century, the mean frequencies of these dental diseases increased (each p<0.05). Tooth loss correlated with caries and odontogenic abscesses (each p<0.05). Although the mean caries and ante-mortem tooth loss frequencies increased since the 18th century, there are overlaps with many pre-18th century cohorts. In addition, in contrast to previous hypotheses, no general increase of caries prevalence in females could in fact be verified. It is likely that changes in nutrition (more sugar) and dental health (possibly higher frequency of tooth extraction) could be the underlying factors which led to this minor to moderate shift of dental disease frequencies in Europe.

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Title
Part 2: Oral health care for the housebound patient. [Review]

Source

Abstract
Oral disease can have a significant impact on the health and wellbeing of the housebound patient. The aetiology of oral conditions such as dental caries and periodontal disease have been well investigated and there is a solid evidence base in how to best prevent their progress. The Department of Health document Delivering better oral health: an evidence-based toolkit for prevention is a valuable resource that outlines the current best preventative evidence in the form of practical advice for clinicians and patients. This article aims to distil and present this advice for the benefit of community nurses. It will identify areas of particular importance for people with additional needs, particularly the elderly and infirm. Outlining how to best tailor preventative advice and treatment for this patient group.