Background: Caries in primary teeth hinder the child to bite and chew and influence their development. Papacarie has the characteristics of selective removal of decayed tissue and can preserve healthy dentine to the maximum, but its efficiency has not been critically evaluated compared to conventional method.

Aim: This review is aiming at comparing the Papacarie and traditional method in caries removal in primary dental caries with children.

Design: Comprehensive literature searching at PubMed, Embase, Cochrane Central Register of Controlled Trials, and Web of Science to January 2018.

Results: Six randomized controlled trials (RCTs) and four prospective controlled clinical trials (CCTs) were included. The microbiota in caries dentine was significantly reduced using the Papacarie treatment ($MD = 0.57$, $95\% CI$ $0.04$ to $1.09$, $P = 0.03$), and the anxiety feeling declined more in the Papacarie group ($MD = -1.01$, $95\% CI -1.72$ to $-0.30$, $P < 0.005$). There was a greater $200.79$ ($MD = 200.79$, $95\% CI$ $152.50$ to $249.09$, $P < 0.00001$) increase in time taken for the Papacarie treatment compared with the conventional method.

Conclusion: Papacarie exerts a positive effect in reducing the bacteria and decreases the pain during caries removal in primary teeth although it costed a longer treatment time compared with the conventional method.
Title
Do HEMA-free adhesive systems have better clinical performance than HEMA-containing ones in non-caries cervical lesions? A systematic review and meta-analysis. [Review]

Abstract
OBJECTIVES: To determine through a systematic review if HEMA-free adhesive systems have better clinical performance than HEMA-containing ones in non-carious cervical lesion (NCCL) restorations.

SOURCES: We systematically searched PubMed, The Cochrane Library, Scopus, Web of Science, and Open Grey databases, using MeSH terms, synonyms, and keywords, with no language or date restriction. The reference lists of included articles were manually searched.

STUDY SELECTION: Randomized controlled clinical trials comparing the effectiveness of HEMA-free and HEMA-containing adhesive systems in NCCL restorations, were included. The risk of bias in the included studies was assessed and classified through the Cochrane Collaboration’s common scheme for bias. Quantitative data were subgrouped according to the main clinical parameters evaluated, and heterogeneity was tested using I² index.

DATA: A total of 2889 potentially relevant studies were identified. After title and abstract examination, 51 studies remained. Finally, 22 studies were included in systematic review, totalling 997 participants. Thus, 13 studies were classified as “low” risk of bias and nine as “unclear”. These 22 studies were also included in the meta-analysis and no significant statistical difference was found between the clinical performances of HEMA-free and HEMA-containing adhesive systems for all parameters analyzed: retention risk difference (RD) 0.03 [-0.01, 0.07] (p=0.13), marginal discoloration RD 0.02 [-0.01, 0.04] (p=0.19), marginal adaptation RD -0.01 [-0.04, 0.01] (p=0.34), caries RD 0.00 [-0.01, 0.01] (p=0.92) or postoperative sensitivity RD -0.00 [-0.02, 0.01] (p=0.72), and for overall effect RD 0.00 [-0.01, 0.01] (p=0.65).

CONCLUSIONS: HEMA-free and HEMA-containing adhesive systems showed similar clinical performance in NCCL restorations.

CLINICAL SIGNIFICANCE: The presence of the monomer HEMA does not influence the clinical performance of the NCCL restoration.
Secondary Caries in situ Models: A Systematic Review.

MATERIALS AND METHODS: Three databases (Medline, Embase, and Cochrane) were searched for relevant literature. Bias risk was assessed and model parameters and caries-related outcomes were extracted by 2 independent researchers. Where possible, caries-related outcomes were normalized by estimating lesion progression per day by dividing lesion depth extracted from microradiographic or microhardness data by the number of days the study lasted.

RESULTS: The literature search identified 335 articles. After eliminating duplicates and selection, 31 articles were included. The models differed greatly on factors such as sample location, presence of fluoride in the model, and analysis methods. Three main groups could be identified by sample placement: 68% of models placed samples palatally in the upper jaw, and the lower jaw model could be divided into the buccal (26%) and approximal (6%) areas. Average lesion progression in enamel next to composite wear a removable in

DISCUSSION: Studies conducted with palatal models showed caries progression rates 2-5 times higher than the estimated clinical progression rates. Lesion progression per day could be a useful tool for future comparison of models and establishing a standardized model.

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Seiffert A; Zaror C; Atala-Acevedo C; Ormeno A; Martinez-Zapata MJ; Alonso-Coello P.

Zaror, Carlos; Atala-Acevedo, Claudia; Ormeno, Andrea; Martinez-Zapata, Maria Jose; Alonso-Coello, Pablo.

Zaror, Carlos; Atala-Acevedo, Claudia; Ormeno, Andrea; Martinez-Zapata, Maria Jose; Alonso-Coello, Pablo.

Zaror, Carlos: Faculty of Dentistry, Universidad de La Frontera, Temuco, Chile.

Zaror, Carlos; Atala-Acevedo, Claudia. Centre for Research in Epidemiology, Economics and Oral Public Health (CIEESPO), Faculty of Dentistry, Universidad de La Frontera, Temuco, Chile.

Zaror, Carlos. CIBER de Epidemiologia y Salud Publica (CIBERESP), Barcelona, Spain.

Seiffert, Andrea. Centre for Research in Epidemiology, Economics and Oral Public Health (CIEESPO), Faculty of Dentistry, Universidad de La Frontera, Temuco, Chile.

Seiffert A; Zaror C; Atala-Acevedo C; Ormeno A; Martinez-Zapata MJ; Alonso-Coello P.

Seiffert, Andrea; Zaror, Carlos; Atala-Acevedo, Claudia; Ormeno, Andrea; Martinez-Zapata, Maria Jose; Alonso-Coello, Pablo.

Seiffert, Andrea; Zaror C; Atala-Acevedo C; Ormeno A; Martinez-Zapata MJ; Alonso-Coello P.

Seiffert A; Zaror C; Atala-Acevedo C; Ormeno A; Martinez-Zapata MJ; Alonso-Coello P.
Abstract

OBJECTIVES: To evaluate the quality of clinical practice guidelines (CPGs) for dental caries prevention in children and adolescents. MATERIALS AND METHODS: We performed a systematic search of CPGs on caries preventive measures between 2005 and 2016. We searched MEDLINE, EMBASE, LILACS, TripDatabase, websites of CPG developers, compilers of CPGs, scientific societies and ministries of health. We included CPGs with recommendations on sealants, fluorides and oral hygiene. Three reviewers independently assessed the included CPGs using the AGREE II instrument. We calculated the standardised scores for the six domains and made a final recommendation about each CPG. Also, we calculated the overall agreement among calibrated reviewers with the intraclass correlation coefficient (ICC).

RESULTS: Twenty-two CPGs published were selected from a total of 637 references. Thirteen were in English and nine in Spanish. The overall agreement between reviewers was very good (ICC=0.90; 95%CI 0.89-0.92). The mean score for each domain was the following: Scope and purpose 89.6+/−12%; Stakeholder involvement 55.0+/−15.6%; Rigour of development 64.9+/−21.2%; Clarity of presentation 84.8+/−14.1%; Applicability 30.6+/−31.5% and Editorial independence 59.3+/−25.5%. Thirteen CPGs (59.1%) were assessed as “recommended”, eight (36.4%) “recommended with modifications” and one (4.5%) “not recommended”.

CONCLUSIONS: The overall quality of CPGs in caries prevention was moderate. The domains with greater deficiencies were Applicability, Stakeholder involvement and Editorial independence.

CLINICAL RELEVANCE: Clinicians should use the best available CPGs in dental caries prevention to provide optimal oral health care to patients.

Ekstrand, Kim Rud; Gimenez, Thais; Ferreira, Fernanda R; Mendes, Fausto M; Braga, Mariana M.

Authors Full Name
Ekstrand, Kim Rud; Gimenez, Thais; Ferreira, Fernanda R; Mendes, Fausto M; Braga, Mariana M.

Institution
Ekstrand, Kim Rud. Department of Odontology, University of Copenhagen, Copenhagen, Denmark.
Gimenez, Thais. Department of Pediatric Dentistry, School of Dentistry, University of Sao Paulo, Sao Paulo, Brazil.
Ferreira, Fernanda R. Department of Pediatric Dentistry, School of Dentistry, University of Sao Paulo, Sao Paulo, Brazil.
Mendes, Fausto M. Department of Pediatric Dentistry, School of Dentistry, University of Sao Paulo, Sao Paulo, Brazil.
Braga, Mariana M. Department of Pediatric Dentistry, School of Dentistry, University of Sao Paulo, Sao Paulo, Brazil.

Title
The International Caries Detection and Assessment System - ICDAS: A Systematic Review.

Source

Local Messages
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Abstract

The aims of this study were: (1) to evaluate the overall reproducibility and accuracy of the International Caries Detection and Assessment System (ICDAS) for assessing primary coronal caries lesions, and (2) to investigate the use of systems associated with the ICDAS for activity assessment of coronal caries lesions. Specific search strategies were adopted to identify studies published up to 2016. For the first objective, we selected studies that assessed primary coronal caries lesions using the ICDAS as a reference standard. A total of 54 studies were included. Meta-analyses summarized the results concerning reproducibility and accuracy (correlation with histology, summary ROC curves [SROC], and diagnostic odds ratio [DOR]). The latter 2 were expressed at D1/D3 levels. The heterogeneity of the studies was also assessed. Reproducibility values (pooled) were > 0.65. The ICDAS mostly presented a good overall performance as most areas under SROC were > 0.75 at D1 and > 0.90 at D3; DOR >=6. For the second objective, we selected studies investigating activity assessment associated with the ICDAS. The meta-analyses pooled results based on the same methodology and parameters as above. Longitudinal findings regarding caries progression were described to estimate the validity of these systems. On average, the systems for activity assessment of caries lesions showed moderate values concerning reproducibility and overall performance. Active caries lesions were more prone to progress than inactive ones after 2 years. In conclusion, the ICDAS presented a substantial level of reproducibility and accuracy for assessing primary coronal caries lesions. Additional systems associated with the ICDAS that classify caries lesion activity can be useful as they are moderately reproducible and accurate.
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RECENT REVIEWS RELATED TO DENTAL CARIES

Status
Publisher
Authors
Grippo, John O; Coleman, Thomas A; Messina, Antonello Maria; Oh, Daniel S.
Author NameID
Grippo, John O; ORCID: http://orcid.org/0000-0002-8213-7849
Messina, Antonello Maria; ORCID: http://orcid.org/0000-0003-4920-8032
Authors Full Name
Grippo, John O; Coleman, Thomas A; Messina, Antonello Maria; Oh, Daniel S.
Institution
Grippo, John O. Department of Biomedical Engineering, Western New England University, 1215 Wilbraham Road, Springfield, Massachusetts.
Coleman, Thomas A. Retired Clinical Practitioner, Colchester, Vermont.
Messina, Antonello Maria. Via Salaria 394/b, Rome, 00199, Italy.
Oh, Daniel S. Division of Oral and Maxillofacial Surgery, College of Dental Medicine, Columbia University, New York.
Title
A literature review and hypothesis for the etiologies of cervical and root caries.
Source
Local Messages
THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY, TO REQUEST THIS ARTICLE FROM THE LIBRARY GO TO:
Abstract
The presence of endogenous acids from bacteria acting on a suitable substrate combined with sources of exogenous biocorrosives such as exogenous acids and proteolytic enzymes in areas of stress concentration are hypothesized to lead to the development and progression of cervical and root caries (RC). Quantifying the effects of each of the mechanisms (stress and biocorrosion) is a daunting task to investigate since so many factors are involved at various times in the etiology of noncarious cervical lesions (NCCLs), cervical caries (CC), and RC. Frictional action of the tongue has a cleansing effect and lingual serous saliva, which has a high flow rate buffering capacity from bicarbonates seem to account for the paucity of lingual NCCLs, cervical, and RC in these areas of teeth. Future studies are indicated to determine the effects of stress and biocorrosion and their factors in the etiology of CC and RC.

CLINICAL SIGNIFICANCE: This manuscript presents hypothetical and literary information that the combined effects of stress concentration and biocorrosion contribute to the formation as well as progression of cervical and root caries.

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Authors
Sa-Pinto, A C; Rego, T M; Marques, L S; Martins, C C; Ramos-Jorge, M L; Ramos-Jorge, J.
Author NameID
Sa-Pinto, A C; ORCID: http://orcid.org/0000-0003-2786-563X
Authors Full Name
Sa-Pinto, A C; Rego, T M; Marques, L S; Martins, C C; Ramos-Jorge, M L; Ramos-Jorge, J.
Institution
Sa-Pinto, A C. Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Universidade Federal dos Vales do Jequitinhonha e Mucuri, Rua da Gloria, 187-Centro, Diamantina, MG, 39.100-000, Brazil. anaclara_sa@live.com.
Rego, T M. Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Universidade Federal dos Vales do Jequitinhonha e Mucuri, Rua da Gloria, 187-Centro, Diamantina, MG, 39.100-000, Brazil.
Marques, L S. Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Universidade Federal dos Vales do Jequitinhonha e Mucuri, Rua da Gloria, 187-Centro, Diamantina, MG, 39.100-000, Brazil.
Martins, C C. Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil.
Ramos-Jorge, M L. Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Universidade Federal dos Vales do Jequitinhonha e Mucuri, Rua da Gloria, 187-Centro, Diamantina, MG, 39.100-000, Brazil.
Ramos-Jorge, J. Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil.
Title
Association between malocclusion and dental caries in adolescents: a systematic review and meta-analysis. [Review]
Source
Abstract
AIM: To evaluate the scientific evidence regarding the association between malocclusion and dental caries in adolescents.
METHODS: Searches were conducted of six electronic databases, complemented by manual searching of the reference lists of the selected articles and grey literature. Two independent reviewers performed the selection of the articles, data extraction and the evaluation of the risks of bias through an assessment of methodological quality. Meta-analysis was performed considering the mean decayed, missing and filled teeth (DMFT) index for caries and the Dental Aesthetic Index (DAI) for malocclusion. Heterogeneity was tested using the I^2 statistic and a random effect model was employed. Summary effect measures were calculated as differences in means.

RESULTS: The initial search retrieved 2644 studies, only 15 of which were selected for full-text analysis. Four cross-sectional studies were included in the qualitative systematic review. Only one of these studies found no association between malocclusion and dental caries. The meta-analysis of three studies demonstrated that a lower DAI value was significantly associated with a lower mean DMFT index, except for the comparison of DAI 26-30 vs. 31-35.

CONCLUSIONS: Based on the studies analysed, the scientific evidence indicates an association between malocclusion and dental caries.

Publication Type
Journal Article. Review.
Year of Publication
2018
Title
Third Molar and Their Relationship with Caries on the Distal Surface of Second Molar: A Meta-analysis. [Review]

Source

Abstract
Purpose: The aim of this meta-analysis was to determine which characteristics of mandibular third molars (MTMs) are more often associated with an increase in the prevalence/incidence of caries on the distal surface of mandibular second molars (MSMs).

Methods: Three electronic databases were analyzed: PubMed; OVID and the Virtual Health Library. Observational studies were included, and the risk of bias was assessed using The Newcastle-Ottawa Scale. The Comprehensive Meta-Analysis software program was used for meta-analysis.

Results: Fifteen studies were included in this systematic review, and five were included in the meta-analysis. The distal surface of MSMs were more likely to exhibit caries in the following scenarios: when MTMs were found in the A position, rather than the C position (OR: 3.45, 95% CI: 2.28-5.22, p<0.001); when the horizontal position was compared with the vertical (OR: 8.12, 95% CI: 3.75-17.58, p<0.001) and distoangular (OR: 9.75, 95% CI: 3.49-27.25, p<0.001) positions; and when the mesioangular position was compared with the vertical (OR: 7.25, 95% CI: 3.48-15.10, p<0.001) and distoangular (OR: 9.54, 95% CI: 3.47-26.21, p<0.001) positions.

Conclusion: The results of this study suggest that the presence of MTMs increases the incidence of caries on the distal surface of MSMs. Furthermore, caries on the distal surface of MSMs is more commonly associated with position A and horizontal and mesioangular mandibular molars.

Publication Type
Journal Article. Review.

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2018

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Authors
Rai NK; Tiwari T.

Authors Full Name
Rai, Nayanjot Kaur; Tiwari, Tamanna.

Institution
Rai, Nayanjot Kaur. School of Dental Medicine, University of Colorado, Anschutz Medical Campus, Aurora, CO, United States. Tiwari, Tamanna. School of Dental Medicine, University of Colorado, Anschutz Medical Campus, Aurora, CO, United States.

Title
Parental Factors Influencing the Development of Early Childhood Caries in Developing Nations: A Systematic Review.

Source

Abstract
Background: Early childhood caries (ECC) is one of the most prevalent and chronic conditions of childhood. Various factors including biological and dietary factors along with an overlay of parental social factors have been found to be associated with the progression of ECC. The objective of this systematic review is to synthesize available literature and to identify parent-level proximal and distal risk factors associated with the development of ECC in developing nations.

Methods: Studies conducted in developing nations, published between 2005 and 2017 in English, that included children younger than 6years and examined ECC were included. The outcome of interest were parental risk factors, which included parental...
knowledge, behavior, attitudes, sense of coherence (SOC), stress, socioeconomic status (SES), education, and breastfeeding duration. The studies were retrieved from MEDLINE, Ovid Medline, and PubMed.

Results: The search yielded 325 studies, of which 18 were considered eligible for inclusion in this review. Ten studies found maternal education, and seven studies found parental education to be significantly associated with ECC. SES was significantly associated with ECC in 13 studies in the form of annual household income and occupation level. Four studies observed the significant association between oral health knowledge and attitudes with ECC, whereas only two studies found maternal attitude to be associated with ECC. Breastfeeding duration was a significant risk factor in four studies. One study each found significant associations of SOC, parental distress, and secondary smoke with ECC.

Conclusion: To date, most of the researches done in developing countries have reported distal parental factors such as income and education being significant risk factors in caries development compared to proximal risk factors in low-income groups. Only a few studies analyzed the psychosocial and behavioral factors. Interventions could be designed to improve parental oral health knowledge and behaviors in these nations.

**Publication Type**
Journal Article.

**Year of Publication**
2018
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 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 degradation.

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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RECENT REVIEWS RELATED TO DENTAL CARIES

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VI 1
Status
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Authors
Tikhonova S; Booij L; D'Souza V; Crosara KTB; Siqueira WL; Emami E.
Author NameID
Tikhonova, Svetlana; ORCID: https://orcid.org/0000-0002-3559-8538
Authors Full Name
Tikhonova, Svetlana; Booij, Linda; D'Souza, Violet; Crosara, Karla T B; Siqueira, Walter L; Emami, Elham.
Institution
Tikhonova, Svetlana. Faculty of Dentistry, McGill University, 2001 McGill College Avenue, Montreal, QC, H3A 1G1, Canada.
svetlana.tikhonova@mcgill.ca.
Booij, Linda. Department of Psychology, Concordia University, 7141 Sherbrooke St. West, Montreal, QC, H4B 1R6, Canada.
D'Souza, Linda. CHU Sainte-Justine & Universite de Montreal, Montreal, Canada.
Crosara, Karla T B. Schulich School of Medicine & Dentistry, The University of Western Ontario, London, ON, N6A 5C1, Canada.
Siqueira, Walter L. Schulich School of Medicine & Dentistry, The University of Western Ontario, London, ON, N6A 5C1, Canada.
Emami, Elham. Faculty of Dentistry, Universite de Montreal, C.P. 6128, succ. Centre-ville, Montreal, QC, H3C 3J7, Canada.
Title
Investigating the association between stress, saliva and dental caries: a scoping review.
Source
Abstract
BACKGROUND: This scoping review addressed the question ‘what do we know about stress-related changes in saliva and dental caries in general population?’

METHODS: The review was conducted using electronic searches via Embase, MEDLINE, PsycINFO, CINAHL and WoS. All published human studies with both observational and experimental designs were included. Two reviewers independently reviewed eligible articles and extracted the data. The studies’ quality was assessed using the Effective Public Health Practice Project Quality Assessment Tool.

RESULTS: Our search identified 232 reports, of which six were included in this review. All six studies were conducted in children and used salivary cortisol as stress marker. The studies varied by design, types of stressors, children's caries experience, methods of saliva collection. Four studies reported a positive association between saliva cortisol levels and caries (p<0.05) while the other two reported no association (p>0.05). The quality of the included studies was weak to moderate.

CONCLUSIONS: There is lack of evidence about an association between stress-related changes in saliva and caries. Well-designed longitudinal studies with rigorous measurement technics for stress, saliva and dental caries are necessary. This will help to generate new insights into the multifactorial etiology of caries and provide evidence for a rational method for its control.
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Authors
Wagle M; D'Antonio F; Reierth E; Basnet P; Trovik TA; Orsini G; Manzoli L; Acharya G.
Author NameID
Wagle, Madhu; ORCID: https://orcid.org/0000-0002-4671-8160
Authors Full Name
Wagle, Madhu; D'Antonio, Francesco; Reierth, Eirik; Basnet, Purusotam; Trovik, Tordis A; Orsini, Giovanna; Manzoli, Lamberto; Acharya, Ganesh.
Institution
Wagle, Madhu. Department of Clinical Medicine, Faculty of Health Sciences, Women's Health and Perinatology Research Group, University of Tromso - The Arctic University of Norway, Tromso, Norway.
D'Antonio, Francesco. Department of Clinical Medicine, Faculty of Health Sciences, Women's Health and Perinatology Research Group, University of Tromso - The Arctic University of Norway, Tromso, Norway.
Reierth, Eirik. Science and Health Library, University Library, University of Tromso - The Arctic University of Norway, Tromso, Norway.
Basnet, Purusotam. Department of Obstetrics and Gynaecology, University Hospital of Northern Norway, Tromso, Norway.
Orsini, Giovanna. Department of Clinical Sciences and Stomatology, Politecnich University of Marche, Ancona, Italy.
Manzoli, Lamberto. Department of Medical Sciences, University of Ferrara, Ferrara, Italy.
Acharya, Ganesh. Department of Clinical Medicine, Faculty of Health Sciences, Women's Health and Perinatology Research Group, University of Tromso - The Arctic University of Norway, Tromso, Norway.
Acharya, Ganesh. Department of Clinical Science, Intervention and Technology, Karolinska Institute, Stockholm, Sweden.
Acharya, Ganesh. Center for Fetal Medicine, Karolinska University Hospital, Stockholm, Sweden.

**Title**
Dental caries and preterm birth: a systematic review and meta-analysis.

**Source**
BMJ Open. 8(3):e018556, 2018 03 02.

**Abstract**

**OBJECTIVES:** The primary objective of this systematic review was to evaluate the association between dental caries and preterm birth (PTB). The secondary objective was ascertaining the difference between women with dental caries who experienced PTB and those who did not regard to decayed, missing and filled teeth (DMFT), and decayed, missing and filled surfaces (DMFS) indices.

**METHODS:** MEDLINE, Embase, CINAHL and Cochrane databases were searched initially in November 2015 and repeated in December 2016. We included observational cohort and case-control studies. Only studies reporting the risk of PTB in women affected compared with those not affected by dental caries in pregnancy were included. Random-effect meta-analyses were used to compute the summary OR of PTB among women with caries versus women without caries, and the mean difference in either DMFT or DMFS indices between women experiencing PTB and those without PTB.

**RESULTS:** Nine observational studies (4826 pregnancies) were included. Women affected by dental caries during pregnancy did not show a significantly higher risk of PTB (OR: 1.16, 95% CI 0.90 to 1.49, P=0.25, I²=35%). Also, the women with PTB did not show significantly higher DMFT or DMFS indices (summary mean differences: -1.56, P=0.10; I²=92% and -0.15, P=0.9, I²=89%, respectively).

**CONCLUSION:** Dental caries does not appear to be a substantial risk factor for PTB.

**TRIAL REGISTRATION NUMBER:** NCT01675180; Pre-results.

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**Analysis of recently published research appears to show only short-term improvements in plaque indices.**

**Authors**
Cai J; Palamara J; Manton DJ; Burrow MF.

**Institution**
Cai, J. Melbourne Dental School, The University of Melbourne, Melbourne, Victoria, Australia.
Palamara, Jea. Melbourne Dental School, The University of Melbourne, Melbourne, Victoria, Australia.
Manton, D J. Melbourne Dental School, The University of Melbourne, Melbourne, Victoria, Australia.
Burrow, M F. Melbourne Dental School, The University of Melbourne, Melbourne, Victoria, Australia.
The aim of this literature review is to explore the treatment methods for root caries in laboratory and clinical research in the last decade. A systematic search of publications in PubMed and Web of Science databases was performed. The timespan was limited to the last 10 years and English language. Further retrieval was conducted using the search terms of specific therapies or treatments. Eighty-two articles were included in this systematic review and full texts were retrieved. Types of studies included laboratory studies and clinical trials. Therapeutic approaches for root caries without risk of pulp exposure can be categorized into non-invasive and restorative treatment. Non-invasive treatments which targeted different causative factors of root caries have been developed in the last decade. Accordingly, several artificial caries model systems have been proposed for the study of root caries in the laboratory. Carious tissue excavation techniques and restorative materials and procedures have been modified to improve the prognosis of invasive treatment. It is of importance to determine the most appropriate therapy for root caries and further clinical trials are needed to draw firm conclusions concerning the efficacy and consistency of the various treatment methods proposed.

CONCLUSION: Bonding to SoD yields better results compared to CAD. Etch-and-rinse adhesives performed better than self-rinse adhesives when applied to CAD.
Candida albicans and Early Childhood Caries: A Systematic Review and Meta-Analysis.

Authors
Xiao J; Huang X; Alkhers N; Alzamil H; Alzoubi S; Wu TT; Castillo DA; Campbell F; Davis J; Herzog K; Billings R; Kopycka-Kedzierawski DT; Hajishengallis E; Koo H.

Institution
Xiao, Jin. Eastman Institute for Oral Health, University of Rochester Medical Center, Rochester, NY, USA.

Abstract
Oral Candida albicans has been detected in children with early childhood caries (ECC) and has demonstrated cariogenic traits in animal models of the disease. Conversely, other studies found no positive correlation between C. albicans and caries experience in children, while suggesting it may have protective effects as a commensal organism. Thus, this study aimed to examine whether oral C. albicans is associated with ECC. Seven electronic databases were searched. The data from eligible studies were extracted, and the risk of bias was evaluated. A fixed effects model (Mantel-Haenszel estimate) was used for meta-analysis, and the summary effect measure was calculated by odds ratio (OR) and 95% confidence interval (CI). Fifteen cross-sectional studies were included for the qualitative assessment and 9 studies for meta-analysis. Twelve studies revealed higher oral C. albicans prevalence in ECC children than in caries-free children, while 2 studies indicated an equivalent prevalence. A pooled estimate, with OR = 6.51 and 95% CI = 4.94-8.57, indicated a significantly higher ECC experience in children with oral C. albicans than those without C. albicans (p < 0.01). The odds of experiencing ECC in children with C. albicans versus children without C. albicans were 5.26 for salivary, 6.69 for plaque, and 6.3 for oral swab samples. This systematic review indicates that children with oral C. albicans have >5 times higher odds of having ECC compared to those without C. albicans. Further prospective cohort studies are needed to determine whether C. albicans could be a risk factor for ECC, and whether it is dependent on different sample sources (saliva/plaque).
OBJECTIVE: The aim of this review is to conduct a systematic review and meta-analysis comparing the effectiveness of in-home or in-office treatments for dentin hypersensitivity.

MATERIALS AND METHODS: An electronic search without restriction on dates or languages was performed in four electronic databases until March 2017. In addition, hand-searches in regular journals and in the gray literature were also conducted. To develop the search strategy, clinical questions were formulated using the PICOS method. Eligibility criteria included randomized clinical trials (RCTs) that compared the effectiveness of different agents for the treatment of dentin hypersensitivity through chemical occlusion, physical occlusion, nerve desensitization, or photobiomodulation (low-level light therapy). This systematic review was registered in PROSPERO under number CRD42016039394.

RESULTS: Twenty-five RCTs (16 parallel; 9 split-mouth), published from 1992 to 2016, were included. The results of the meta-analysis showed that in-office subgroups treated with chemical or physical occlusion of dentin tubules and nerve desensitization had a statistically significant difference from placebo, with P<0.00001, P<0.00001, and P=0.02, respectively. For in-home treatments, the results of the meta-analysis showed that only those subgroups treated with chemical occlusion of dentin tubules and nerve desensitization exhibited a statistically significant difference from placebo, with P<0.00001 and P=0.03, respectively.

CONCLUSIONS: The results of pairwise meta-analysis suggest that among in-office treatments, dentinal tubule occlusion (whether chemical or physical) and nerve desensitization provide the best outcomes for treatment of dentin hypersensitivity. For in-home treatments, only chemical occlusion of dentin tubules and nerve desensitization showed a greater treatment efficacy than placebo and the difference was statistically significant.

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Authors
Bijle MNA; Yiu CKY; Ekambaram M.
Author NameID
Ekambaram, Manikandan; ORCID: http://orcid.org/0000-0002-9156-3727

Authors Full Name
Bijle, Mohammed Nadeem Ahmed; Yiu, Cynthia Kar Yung; Ekambaram, Manikandan.

Institution
Bijle, Mohammed Nadeem Ahmed. Pediatric Dentistry Unit, Pediatric Dentistry and Orthodontics, Faculty of Dentistry, The University of Hong Kong, Hong Kong.
Yiu, Cynthia Kar Yung. Pediatric Dentistry Unit, Pediatric Dentistry and Orthodontics, Faculty of Dentistry, The University of Hong Kong, Hong Kong.
Ekambaram, Manikandan. Pediatric Dentistry Unit, Pediatric Dentistry and Orthodontics, Faculty of Dentistry, The University of Hong Kong, Hong Kong.

Title
Can oral ADS activity or arginine levels be a caries risk indicator? A systematic review and meta-analysis. [Review]

Source

Abstract
OBJECTIVES: The objective of this study was to evaluate the association between salivary and plaque arginine levels/ADS activities with dental caries.
MATERIALS AND METHODS: A systematic search was performed as per PRISMA statement using PubMed, Scopus, Cochrane Library, and Web of Science. Published studies that investigated adults and children (P) with caries-active status (E) and caries-free status (C), whereby arginine levels/ADS activity (O) was measured in saliva/plaque to analyze exposure-outcome association compared to the control group were deemed eligible for inclusion. Quality assessment was performed using combined Newcastle-Ottawa Scale and Modified RTI Item Bank scale. Meta-analysis was performed for effect size, precision estimation, and subgroup effects analysis.

RESULTS: Of 233 records identified, seven (kappa=1.00) were included for qualitative synthesis (systematic review) and four for quantitative synthesis (meta-analysis). No specific bias could be identified in five studies assessed as per the Modified RTI Item Bank scale. Two studies received lower scores on the Newcastle Ottawa scale. Plaque ADS activity in adults (effect size=0.93, p=0.008), salivary ADS activity in adults and children (effect size=0.85, p<0.001), and salivary ADS activity in adults (effect size=0.87, p<0.001) identified a statistically significant effect size. Subgroup analysis demonstrated non-significant variance (Q value=0.042, p=0.838) between saliva and plaque ADS activities of adults.

CONCLUSIONS: The results of this review suggest the salivary and plaque ADS activities appear to be promising caries risk indicators for adults, while results remain inconclusive in children.

CLINICAL RELEVANCE: Measuring ADS activities (saliva or plaque) can be a potential caries risk indicator in adults. The protocol was registered on PROSPERO database: CRD42017060701.
However, larger children, with similar pulpal symptoms and failure, but selective caries removal may result in a low incidence of significant difference was observed in pulpal symptoms (OR=0.79, 95% CI: 0.30-2.81).

The risk of pulpal exposure was significantly reduced in the selective caries removal group (OR=0.11, 95% CI: 0.04-0.30). No significant difference was observed in pulpal symptoms (OR=0.79, 95% CI: 0.30-2.12) and failure (OR=1.40, 95% CI: 0.69-2.84) between the groups.

CONCLUSIONS: The efficacy of selective caries removal appears comparable to that of non-selective caries removal in children, with similar pulpal symptoms and failure, but selective caries removal may result in a low incidence of pulpal exposure. However, larger-scale RCTs with long-term follow-up are required to confirm this conclusion.
Effectiveness of oral health education on oral hygiene and dental caries in schoolchildren: Systematic review and meta-analysis.

OBJECTIVES: The objective of this study was to evaluate the effectiveness of oral health educational actions in the school context in improving oral hygiene and dental caries in schoolchildren through systematic review and meta-analysis.

METHODS: Clinical trials with schoolchildren between 5 and 18 years old were included. Eligible studies were those which had as outcomes caries, plaque accumulation, gingivitis, toothache or tooth loss and which had been published from 1995 to 2015, in any language. The risk of bias was assessed in specific domains according to the Cochrane Handbook. A meta-analysis was carried out using fixed-effects models.

RESULTS: A total of 4417 references were found, from which 93 full texts were evaluated and 12 included in this meta-analysis. Five studies showed a reduction in plaque levels, and two studies with gingivitis as the outcome found no effect. There was not enough evidence on the effectiveness of the interventions in reducing dental caries.

CONCLUSIONS: Traditional oral health educational actions were effective in reducing plaque, but not gingivitis. There is no long-term evidence in respect of the effectiveness of these interventions in preventing plaque accumulation, gingivitis and dental caries in the school environment.
Foster Page, Lyndie. Department of Oral Sciences, Faculty of Dentistry, University of Otago, Otago, New Zealand.

Title
Cost-effectiveness of caries-preventive fluoride varnish applications in clinic settings among patients of low, moderate and high risk.

Source

Abstract
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.

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Recent Reviews Related to Dental Caries

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 settings 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)).

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Foster Page, Lyndie. Department of Oral Sciences, Faculty of Dentistry, University of Otago, Otago, New Zealand.

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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.
A systematic review of the effects of supervised toothbrushing on caries incidence in children and adolescents. [Review]

BACKGROUND: The anticaries effect of supervised toothbrushing, irrespective of the effect of fluoride toothpaste, has not been clearly determined yet.

AIM: To assess the effects of supervised toothbrushing on caries incidence in children and adolescents.

DESIGN: A systematic review of controlled trials was performed (CRD42014013879). Electronic and hand searches retrieved 2046 records, 112 of which were read in full and independently assessed by two reviewers, who collected data regarding characteristics of participants, interventions, outcomes, length of follow-up and risk of bias.

RESULTS: Four trials were included and none of them had low risk of bias. They were all carried out in schools, but there was great variation regarding children's age, fluoride content of the toothpaste, baseline caries levels and the way caries incidence was reported. Among the four trials, two found statistically significant differences favouring supervised toothbrushing, but information about the magnitude and/or the precision of the effect estimate was lacking and in one trial clustering effect was not taken into consideration. No meta-analysis was performed due to the clinical heterogeneity among the included studies and differences in the reporting of data.

CONCLUSIONS: There is no conclusive evidence regarding the effectiveness of supervised toothbrushing on caries incidence.

Fluoride mouthrinses for preventing dental caries in children and adolescents. [Review]

The Mission of the Cochrane Nursing Care Field (CNCF) is to improve health outcomes through increasing the use of the Cochrane Library and supporting Cochrane's role by providing an evidence base for nurses and related health care professionals involved in delivering, leading, or researching nursing care. The CNCF produces "Cochrane Corner" columns (summaries of recent nursing-care-relevant Cochrane Reviews) that are regularly published in collaborating nursing-care-related journals. Information on the processes this Field has developed can be accessed at: http://cncf.cochrane.org/evidence-transfer-program-review-summaries.
Medical management of caries is a distinct treatment philosophy that employs topical minimally invasive therapies that treat the disease and is not merely prevention. This strategy is justified as an alternative or supplement to traditional care by significant disease recurrence rates following comprehensive operative treatment under general anesthesia. Silver diamine fluoride (SDF) is one agent to enable effective noninvasive treatment. The announcement of breakthrough therapy designation by the Food and Drug Administration (FDA) suggests that SDF may become the first FDA-approved drug for treating caries. Since our systematic review performed in April 2015, 4 clinical trials have been completed, which inform an update to the application protocol and frequency regimen. Suggestions from these studies are to skip the rinsing step due to demonstration of safety in young children, start patients with high disease severity on an intensive regimen of multiple applications over the first few weeks, and continue with semiannual maintenance doses as previously suggested. Breakthroughs in elucidating the impact of SDF on the dental plaque microbiome inform potential opportunities for understanding caries arrest. SDF can be added to the set of evidence-based noninvasive methods to treat caries lesions in primary teeth, such as the Hall crown technique and sealing lesions with accessible margins.
BACKGROUND: Slow-release fluoride devices have been investigated as a potentially cost-effective method of reducing dental caries in people with high risk of disease. This is the second update of the Cochrane Review first published in 2006 and previously updated in 2014.

OBJECTIVES: To evaluate the effectiveness and safety of different types of slow-release fluoride devices on preventing, arresting, or reversing the progression of carious lesions on all surface types of primary (deciduous) and permanent teeth.

SEARCH METHODS: Cochrane Oral Health's Information Specialist searched the following electronic databases: Cochrane Oral Health's Trials Register (to 23 January 2018); the Cochrane Central Register of Controlled Trials (CENTRAL; 2017, Issue 12) in the Cochrane Library (searched 23 January 2018); MEDLINE Ovid (1946 to 23 January 2018); and Embase Ovid (1980 to 23 January 2018). The US National Institutes of Health Ongoing Trials Register ClinicalTrials.gov, and the World Health Organization International Clinical Trials Registry Platform were searched for ongoing trials (23 January 2018). We placed no restrictions on the language or date of publication when searching the electronic databases.

SELECTION CRITERIA: Parallel randomised controlled trials (RCTs) comparing slow-release fluoride devices with an alternative fluoride treatment, placebo, or no intervention in all age groups. The main outcome measures sought were changes in numbers of decayed, missing, and filled teeth or surfaces (DMFT/DMFS in permanent teeth or dmft/dmfs in primary teeth), and progression of carious lesions through enamel and into dentine.

DATA COLLECTION AND ANALYSIS: We conducted data collection and analysis using standard Cochrane review methods. At least two review authors independently performed all the key steps in the review such as screening of abstracts, application of inclusion criteria, data extraction, and risk of bias assessment. We resolved discrepancies through discussions or arbitration by a third or fourth review author.

MAIN RESULTS: We found no evidence comparing slow-release fluoride devices against other types of fluoride therapy. We found only one double-blind RCT involving 174 children comparing a slow-release fluoride device (glass beads with fluoride were attached to buccal surfaces of right maxillary first permanent molar teeth) against control (glass beads without fluoride were attached to buccal surfaces of right maxillary first permanent molar teeth). This study was assessed to be at high risk of bias. The study recruited children from seven schools in an area of deprivation that had low levels of fluoride in the water. The mean age at the beginning of the study was 8.8 years and at the termination was 10.9 years. DMFT in permanent teeth or dmft in primary teeth was greater than one at the start of the study and greater than one million colony-forming units of Streptococcus mutans per millilitre of saliva. Although 132 children were still included in the trial at the two-year completion point, examination and statistical analysis was performed on only the 63 children (31 in intervention group, 32 in control group) who had retained the beads (retention rate was 47.7% at 2 years). Among these 63 children, caries increment was reported to be statistically significantly lower in the intervention group than in the control group (DMFT: mean difference -0.72, 95% confidence interval (CI) -1.23 to -0.21; DMFS: mean difference -1.52, 95% CI -2.68 to -0.36 (very low-quality evidence)). Although this difference was clinically significant, it only holds true for those children who maintain the fluoride beads; over 50% of children did not retain the beads. Harms were not reported within the trial report. Evidence for other outcomes sought in this review (progression to of caries lesion, dental pain, healthcare utilisation data) were also not reported.

AUTHORS’ CONCLUSIONS: There is insufficient evidence to determine the caries-inhibiting effect of slow-release fluoride glass beads. The body of evidence available is of very low quality and there is a potential overestimation of benefit to the average child. The applicability of the findings to the wider population is unclear; the study had included children from a deprived area that had low levels of fluoride in drinking water, and were considered at high risk of caries. In addition, the evidence was only obtained from children who still had the bead attached at 2 years (48% of all available children); children who had lost their slow-release fluoride devices earlier might not have benefited as much from the devices.

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Authors
Salgado-Peralvo AO; Mateos-Moreno MV; Arriba-Fuente L; Garcia-Sanchez A; Salgado-Garcia A; Peralvo-Garcia V; Millan-Yanes M.
Authors Full Name
Salgado-Peralvo, A O; Mateos-Moreno, M V; Arriba-Fuente, L; Garcia-Sanchez, A; Salgado-Garcia, A; Peralvo-Garcia, V; Millan-Yanes, M.
Institution
Salgado-Peralvo, A O. Master in Family and Community Dentistry, University of Seville (US), Seville, Spain. Master in Oral Implantology, University of Seville (US), Seville, Spain. Electronic address: orionsalgado@hotmail.com.
Mateos-Moreno, M V. Associate Professor of Stomatolgy IV. School of Dentistry, Universidad Complutense of Madrid (UCM), Madrid, Spain.
Arriba-Fuente, L. Associate Professor of Stomatology III. School of Dentistry, Universidad Complutense of Madrid (UCM), Madrid, Spain.
Garcia-Sanchez, A. Collaborating Professor in the Master's Program of Oral Esthetics and Rehabilitation, Miguel de Cervantes European University (UEMC), Valladolid, Spain. Master in Oral Implantology, University of Seville (US), Seville, Spain.
INTRODUCTION: Dental caries is the most prevalent non-communicative disease worldwide. Although the etiological factors are well known for years, reducing the number of decayed and missing teeth in children still remains as a barrier. Preventive and curative options are numerous but little is known about their economical advantages. Selecting the intervention that offers the best combination of effectiveness and financial resources becomes crucial in the current situation of budget restrictions worldwide. Areas covered: This expert review summarizes available evidence on cost-effectiveness analyses of preventive and curative measures.
to manage dental caries in children. Expert commentary: Preventive measures have been more extensively studied than dental caries treatment. Only water fluoridation and tooth brushing are well-established as cost-effective preventive approaches. Despite the increasing number of cost analysis treatment studies in the literature, most of them focus on the cost description, with no correlation to the intervention effectiveness. There is a current need of well-designed and well-reported cost-effectiveness regarding dental caries management.

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Authors
Mardini S; Gohel A.
Authors Full Name
Mardini, Shaza; Gohel, Anita.
Institution
Mardini, Shaza. BeamReaders, Inc, 7117 West Hood Place, Suite 110, Kennewick, WA 99336, USA. Electronic address: shaza@beamreaders.com.
Gohel, Anita. Oral and Maxillofacial Radiology, Division of Oral and Maxillofacial Pathology and Radiology, The Ohio State University College of Dentistry, 3165 Postle Hall, 305 West 12th Avenue, Columbus, OH 43210-1267, USA.
Title
Imaging of Odontogenic Infections. [Review]
Source
Abstract
Odontogenic infections represent a common clinical problem in patients of all ages. The presence of teeth enables the direct spread of inflammatory products from dental caries, trauma, and/or periodontal disease into the maxilla and mandible. The radiographic changes seen depend on the type and duration of the inflammatory process and host body response. Imaging plays a central role in identifying the source of infection and the extent of the disease spread and in detecting any complications. Many different imaging modalities can be used. The radiographic features associated with acute and chronic inflammatory processes are discussed.

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Authors
Sedrak MM; Doss LM.
Authors Full Name
Sedrak, Mona M; Doss, Laura M.
Institution
Sedrak, Mona M. Seton Hall University, School of Health and Medical Sciences, 400 South Orange Avenue, South Orange, NJ, 07079 USA. Electronic address: Mona.Sedrak@Shu.Edu.
Doss, Laura M. Elizabeth Mueller and Associates, The Pediatric Dental Center, 6396 Thornberry Ct, Mason, OH 45040, USA.
Title
Open Up and Let Us In: An Interprofessional Approach to Oral Health. [Review]
Source
Abstract
Dental caries is the single most common chronic disease of childhood in the United States. Access to dental care is one of the barriers to improved oral health for children. Primary care providers who routinely treat children have an established role in prevention and early identification of health problems; thus, they are ideal front-line providers who can detect oral health discrepancies and begin the process of care and prevention.

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The traditional concept of caries as a multifactorial transmittable and infectious disease has been challenged. Novel conceptual ideas have come to add to the complexity of this highly prevalent disease worldwide. Current etiological understanding of the disease has emphasized the pivotal role of sugars in caries. In fact, current definition points toward an ecological disease caused by the commensal microbiota that under ecological imbalances, mainly due to high and or frequent sugars consumption, creates a state of dysbiosis in the dental biofilm. This modern conceptual idea, however, tends to underrate a key issue. As humans are omnivore and consume a mix diet composed by a multitude of substances, the role of the diet in caries must not be restricted only to the presence of fermentable sugars. This review explores the contribution of other food components, ubiquitous to the diet, mostly as potentially protective factors. Anticaries nutrients might determine an environmental change, affecting the ecology of the oral microbiome and partially mitigating the effect of sugars. Understanding the function of the food usually consumed by the people will contribute new knowledge on the mechanisms associated with the onset of caries, on new caries risk variables and on potential novel strategies for the prevention and treatment of the disease.

Abstract
Partial-caries-removal would appear to be superior to step-wise.

Clinical evaluation of flowable resin composite versus conventional resin composite in carious and noncarious lesions: Systematic review and meta-analysis. [Review]

Abstract
The purpose of this systematic review was to evaluate clinical performance of flowable composite in carious and noncarious lesions. An electronic search was conducted using specific databases (PubMed, Embase, Cochrane Library, and LILACS) through March 2017. Clinical trials for restoration of carious and noncarious lesions were included with no date restrictions; follow-up was 6 months at least and dental restorations were evaluated using the United States Public Health Service criteria. The systematic search generated 908 papers, of which 35 papers were included for full-text review. Inclusion criteria were met by eight papers, six papers were for noncarious lesions and two papers were for restoration of carious lesions. The results of this review have shown no statistical or clinical difference between flowable and conventional composites for all tested outcomes in both carious and noncarious lesions. Both materials have shown clinically acceptable scores for all criteria, with no evidence of clinically unacceptable scores except in retention, with a retention rate of 83% in both materials after 36 months. Flowable composites had clinical efficacy after 3 years of service similar to that of conventional composite in both carious and noncarious lesions, these results are based on low quality of evidence. Based on the available literature and the best available evidence, flowable composites can be used in restoration of noncarious cervical lesions and minimally invasive occlusal cavities.

Fluoride compounds in dental caries prophylaxis in children and adolescents - review of Polish literature.

Abstract
Dental caries is a process that leads to the destruction of the tooth structure. Statistics about dental caries in Poland are alarming. That is why preventive measures are so important. Fluoride compounds are commonly used in dental prophylaxis. They
support the remineralization, inhibit the demineralization of the enamel and reduce the cariogenic effect of bacteria on the teeth. Fluoride in lower concentration enables the constant reposition of mineral compounds which are lost during acid attacks on the enamel and the formation of fluorapatites which are less susceptible to acids. Higher concentration of fluoride leads to calcium fluoride formation which is a reservoir of that element. It is now believed that the most important is the topical (exogenous) action of fluoride. The basic method of caries prevention is brushing teeth twice a day with fluoride toothpaste. It should be emphasized that special attention ought to be paid to the thorough removal of the dental plaque during brushing the teeth. The other methods of topical fluoridation are for example fluoride varnishes or mouthrinses containing fluoride. Fluoride mouthrinses in most cases can be used by patient at home. Whereas fluoride varnishes should be applied by a professional at a dental clinic. There are also glass-ionomer restorations available which release fluoride ions. According to current knowledge, dental prophylaxis should be adjusted to each patient individually. Based on the literature reviewed, it can be concluded that fluoride compounds play the important role in dental caries prophylaxis and, if only used deliberately, can bring great benefits. However, it should be underlined that in excess - as everything - may be not good for health.

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**Authors**
Hemadi AS; Huang R; Zhou Y; Zou J.

**Authors Full Name**
Hemadi, Abdullah S; Huang, Ruijie; Zhou, Yuan; Zou, Jing.

**Institution**
Hemadi, Abdullah S. State Key Laboratory of Oral Diseases & National Clinical Research Center for Oral Diseases & Department of Pediatric Dentistry, West China Hospital of Stomatology, Sichuan University, Chengdu, China.

Huang, Ruijie. State Key Laboratory of Oral Diseases & National Clinical Research Center for Oral Diseases & Department of Pediatric Dentistry, West China Hospital of Stomatology, Sichuan University, Chengdu, China.

Zhou, Yuan. State Key Laboratory of Oral Diseases & National Clinical Research Center for Oral Diseases & Department of Pediatric Dentistry, West China Hospital of Stomatology, Sichuan University, Chengdu, China.

Zou, Jing. State Key Laboratory of Oral Diseases & National Clinical Research Center for Oral Diseases & Department of Pediatric Dentistry, West China Hospital of Stomatology, Sichuan University, Chengdu, China.

**Title**
Salivary proteins and microbiota as biomarkers for early childhood caries risk assessment. [Review]

**Source**

**Abstract**
Early childhood caries (ECC) is a term used to describe dental caries in children aged 6 years or younger. Oral streptococci, such as Streptococcus mutans and Streptococcus sobrinus, are considered to be the main etiological agents of tooth decay in children. Other bacteria, such as Prevotella spp. and Lactobacillus spp., and fungus, that is, Candida albicans, are related to the development and progression of ECC. Biomolecules in saliva, mainly proteins, affect the survival of oral microorganisms by multiple innate defensive mechanisms, thus modulating the oral microflora. Therefore, the protein composition of saliva can be a sensitive indicator for dental health. Resistance or susceptibility to caries may be significantly correlated with alterations in salivary protein components. Some oral microorganisms and saliva proteins may serve as useful biomarkers in predicting the risk and prognosis of caries. Current research has generated abundant information that contributes to a better understanding of the roles of microorganisms and salivary proteins in ECC occurrence and prevention. This review summarizes the microorganisms that cause caries and tooth-protective salivary proteins with their potential as functional biomarkers for ECC risk assessment. The identification of biomarkers for children at high risk of ECC is not only critical for early diagnosis but also important for preventing and treating the disease.

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**Authors**
Schwendicke F.

**Author NameID**
Schwendicke, Falk; ORCID: http://orcid.org/0000-0003-1223-1669

**Authors Full Name**
Schwendicke, Falk.

**Institution**
Schwendicke, Falk. Charite, University of Medicine, Department of Operative and Preventive Dentistry, Asmannhauser Str. 4-6, 14197 Berlin, Germany.

**Title**
Contemporary concepts in carious tissue removal: A review. [Review]
implications for practitioners? It is important for oral health practitioners to have access to current and relevant statistical data on caries and periodontal disease prevalence and experience for Indigenous adults in Australia published in peer-reviewed journals. It demonstrates significant limitations in the data, including no data for non-cavitated lesions or stainless steel crowns (the Hall Technique, for cavitated lesions in primary molars), or opening up the lesion and regularly cleaning it (nonrestorative cavity control, currently not supported by sufficient evidence).

 CLINICAL SIGNIFICANCE: Dentists should tailor their carious tissue removal strategy according to tooth type and, more importantly, lesion depth.
health of Indigenous Australians. However, we have highlighted significant evidence gaps for this population group within the peer-reviewed literature and identified the limitations of the available data upon which decisions are currently being made. This paper also identifies ways to capture and report oral health data in the future to enable more meaningful comparisons and relevance for use in policy development.

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Authors
Saminsky M.
Authors Full Name
Saminsky, Michael.
Institution
Saminsky, Michael, Department of Periodontology, Goldschlager School of Dental Medicine, Tel-Aviv University, 4 Klachkin St, Tel Aviv 69978, Israel, E-mail: sachermiki@gmail.com.
Title
Periodontal Disease and Dental Caries among children and Adolescents Suffering from Endocrine Disorders - A Literature Review.
Source
Abstract
BACKGROUND: Dental caries and periodontal disease are the most common oral diseases. Their link to disorders of endocrine system is of high interest. Most of the available data relates to the adult population, though its importance among children and adolescents is paramount.

OBJECTIVE: To review the existing evidence examining the link between these clinical conditions among children and adolescents.

DATA SOURCES: Electronic bibliographic databases and hand searches of relevant publications, based on prepared list of relevant key-words was performed.

RESULTS: Paucity of existing data leaves the question of association between most endocrine disorders of the youth with dental caries and periodontal disease, inconclusive, apart from obesity and diabetes mellitus, where it seems to be elucidated.

CONCLUSION: A profound research should be done in order to amend our understanding to what extent, if at all, exists the link between these oral maladies and different pediatric endocrine disorders.

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Authors
Levey C; Innes N; Schwendicke F; Lamont T; Gostemeyer G.
Authors Full Name
Levey, Colin; Innes, Nicola; Schwendicke, Falk; Lamont, Thomas; Gostemeyer, Gerd.
Institution
Levey, Colin. School of Dentistry, University of Dundee, Park Place, Dundee, UK. c.levey@dundee.ac.uk.
Innes, Nicola. School of Dentistry, University of Dundee, Park Place, Dundee, UK.
Schwendicke, Falk. Department of Operative and Preventive Dentistry, Charite-Universitatsmedizin, Berlin, Germany.
Lamont, Thomas. School of Dentistry, University of Dundee, Park Place, Dundee, UK.
Gostemeyer, Gerd. Department of Operative and Preventive Dentistry, Charite-Universitatsmedizin, Berlin, Germany.
Title
Outcomes in randomised controlled trials in prevention and management of carious lesions: a systematic review. [Review]
Source
Abstract
BACKGROUND: Inconsistent outcome reporting is one significant hurdle to combining results from trials into systematic reviews. Core outcome sets (COS) can reduce this barrier. The aim of this review was to map outcomes reported in caries prevention and management randomised controlled trials (RCT) as a first step to COS development. We also investigated RCT characteristics and reporting of primary outcomes and sample size calculations.
METHODS: PubMed, Embase, Web of Knowledge and Cochrane CENTRAL were systematically searched (1 January 1968 to 25 August 2015).

INCLUSION CRITERIA: RCTs comparing any technique for prevention or management of caries with another or placebo and RCTs comparing interventions to support patients undergoing treatment of caries (without setting, dentition or age restrictions). Categories were developed through piloting and group consensus and outcomes grouped accordingly.

RESULTS: Of 4773 search results, 764 were potentially relevant, full text was available for 731 papers and 605 publications met the inclusion criteria and were included. For all outcomes across the time periods 1968-1980 and 2001-2010, reporting of outcome 'caries experience' reduced from 39% to 18%; 'clinical performance of the restoration' reporting increased from 33% to 42% although there was a reduction to 22% in 2011-2015. Emerging outcome domains include 'lesion activity' and 'pulp health-related outcomes', accounting for 1% and 0%, respectively, during 1968-1980 and 10% and 4% for 2011-2015. Reporting 'resource efficiency' and 'quality of life measures' have remained at a low level. No publications reported tooth survival independent of an index such as DMFT or equivalent. Primary outcomes were only identified as such in 414 (68%) of the reports.

CONCLUSIONS: Over the past 50 years, outcome reporting for trials on prevention and management of carious lesions have tended to focus on outcomes measuring caries experience and restoration material clinical performance with lesion activity and cost-effectiveness increasingly being reported. Patient-reported and patient-focused outcomes are becoming more common (although as secondary outcomes) but remain low in use. The challenge with developing a COS will be balancing commonly previously reported outcomes against those more relevant for the future.

TRIAL REGISTRATION: PROSPERO, CRD42015025310. Registered on 14 August 2015, Trials (Schwendicke et al., Trials 16:397, 2015) and COMET initiative online (COMET, 2017).

BDA LIBRARY MEDLINE SEARCH
RECENT REVIEWS RELATED TO DENTAL CARIES

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INCLUSION CRITERIA: RCTs comparing any technique for prevention or management of caries with another or placebo and RCTs comparing interventions to support patients undergoing treatment of caries (without setting, dentition or age restrictions). Categories were developed through piloting and group consensus and outcomes grouped accordingly.

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TRIAL REGISTRATION: PROSPERO, CRD42015025310. Registered on 14 August 2015, Trials (Schwendicke et al., Trials 16:397, 2015) and COMET initiative online (COMET, 2017).

BACKGROUND: The aim of the present study was to assess the relationship between prenatal maternal cigarette smoking (PMCS) and early childhood caries (ECC) through a systematic review of currently available scientific evidence.

MATERIAL AND METHODS: To address the focused question: "Is there an association between PMCS and ECC?" an electronic literature search without time or language restrictions was conducted till May 2017 in indexed databases using various key words including dental caries, pregnancy, smoking, tobacco products and child. Letters to the editor, commentaries, reviews, case reports and case series and studies in which, ECC was investigated without clinical dental examination, were excluded.

RESULTS: Eight observational cross-sectional studies were included. The number of participants ranged between 1102 and 76920 children with age ranging between 24 months and 72 months. Seven studies reported a positive association between PMCS and ECC. One study reported that children whose mother smoked at least five cigarettes/day during pregnancy presented a higher caries severity level compared with those whose mothers did not smoke. One study showed no association between ECC and PMCS.

CONCLUSIONS: The association between PMCS and ECC remains debatable. Further well-designed longitudinal studies are needed in this regard. <b>Key words:</b> Cigarette, early childhood caries, pregnancy, risk factors, smoking.

TRIAL REGISTRATION: PROSPERO, CRD42015025310. Registered on 14 August 2015, Trials (Schwendicke et al., Trials 16:397, 2015) and COMET initiative online (COMET, 2017).

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Authors Kellesarian SV; Malignaggi VR; de Freitas P; Ahmed HB; Javed F.
Authors Full Name
Kellesarian, Sergio-Varela; Malignaggi, Vanessa-Ros; de Freitas, Paula; Ahmed, Hameeda-Bashir; Javed, Fawad.
Institution Kellesarian, Sergio-Varela. Department of General Dentistry, Eastman Institute for Oral Health, University of Rochester, New York, USA.
Malignaggi, Vanessa-Ros. Department of General Dentistry, Universidad Santa Maria, Caracas, Venezuela.
de Freitas, Paula. Department of General Dentistry, Universidad Santa Maria, Caracas, Venezuela.
Ahmed, Hameeda-Bashir. Private Dental Practice, Doha, Qatar.
Javed, Fawad. Department of General Dentistry, Eastman Institute for Oral Health, University of Rochester, New York, USA.
Title Association between prenatal maternal cigarette smoking and early childhood caries. A systematic review. [Review]
Abstract BACKGROUND: The aim of the present study was to assess the relationship between prenatal maternal cigarette smoking (PMCS) and early childhood caries (ECC) through a systematic review of currently available scientific evidence.

MATERIAL AND METHODS: To address the focused question: "Is there an association between PMCS and ECC?" an electronic literature search without time or language restrictions was conducted till May 2017 in indexed databases using various key words including dental caries, pregnancy, smoking, tobacco products and child. Letters to the editor, commentaries, reviews, case reports and case series and studies in which, ECC was investigated without clinical dental examination, were excluded.

RESULTS: Eight observational cross-sectional studies were included. The number of participants ranged between 1102 and 76920 children with age ranging between 24 months and 72 months. Seven studies reported a positive association between PMCS and ECC. One study reported that children whose mother smoked at least five cigarettes/day during pregnancy presented a higher caries severity level compared with those whose mothers did not smoke. One study showed no association between ECC and PMCS.

CONCLUSIONS: The association between PMCS and ECC remains debatable. Further well-designed longitudinal studies are needed in this regard. <b>Key words:</b> Cigarette, early childhood caries, pregnancy, risk factors, smoking.

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Unique Identifier 29070060

BACKGROUND: Obesity and dental caries are global public health problems which can impact in childhood and throughout the life course. In simple terms, childhood dental caries and body weight are linked via the common risk factor of diet. An association between dental caries and obesity has been described in a number of studies and reviews. However, similarly, a relationship has also been noted between low body weight and caries experience in children. This protocol will provide the framework for an umbrella review to address the following question: Does the available evidence support a relationship between dental caries experience and body weight in the child population?

METHODS: This review protocol outlines the process to carry out an umbrella systematic review which will synthesise previous reviews of childhood dental caries experience and body weight. An umbrella review methodology will be used to examine the methodological and reporting quality of existing reviews.

DISCUSSION: The final umbrella review aims to aggregate the available evidence in order to provide a summary for policymakers and to inform healthcare interventions.

SYSTEMATIC REVIEW REGISTRATION: PROSPERO CRD42016047304.
OBJECTIVES: The aim of the present study was to evaluate the prevalence and severity of dental caries school children in the Gulf Cooperation Council (GCC) area, to help the development of systematic approaches for preventive oral care programs in the GCC states and to provide sound information for oral health promotion and public health care.

MATERIALS AND METHODS: A comprehensive search to identify both published and unpublished articles concerning relevant studies of dental caries in children aged 6-16 years for their permanent teeth published from 1992 to 2016 with no language and time limit was performed. The search strategies employed electronic databases and incorporated both dental subject headings and free-text term.

RESULTS: The overall mean decayed, missing and filled teeth in the permanent teeth was 2.57, and the prevalence was 64.7% in the GCC area.

CONCLUSIONS: Most of the studies were conducted in the Kingdom of Saudi Arabia. The results may not be a true reflection, and other countries in GCC are urged to study the prevalence and severity of caries in their children population.

Authors: Costa FS; Silveira ER; Pinto GS; Nascimento GG; Thomson WM; Demarco FF.

Institution: Costa, Francine S. Postgraduate Program in Dentistry and Postgraduate Program in Epidemiology, Federal University of Pelotas, Pelotas, Brazil. Electronic address: francinesct@gmail.com.
Silveira, Ethieli R. Postgraduate Program in Dentistry, Federal University of Pelotas, Pelotas, Brazil. Electronic address: ethieli2@gmail.com.
Pinto, Gabriela S. College in Dentistry, Faculdade Especializada na Area de Saude do Rio Grande do Sul, Passo Fundo, Brazil. Electronic address: gabipinto@gmail.com.
Nascimento, Gustavo G. Federal University of Pelotas and Section of Periodontology, Department of Dentistry and Oral Health, Aarhus University, Aarhus, Denmark. Electronic address: gustavo.gnascimento@hotmail.com.
Thomson, William Murray. Sir John Walsh Research Institute, University of Otago, Dunedin, New Zealand. Electronic address: murray.thomson@otago.ac.nz.
Demarco, Flavio F. Postgraduate Program in Dentistry and Postgraduate Program in Epidemiology, Federal University of Pelotas, Pelotas, Brazil. Electronic address: ffdemarco@gmail.com.

Title: Developmental defects of enamel and dental caries in the primary dentition: A systematic review and meta-analysis. [Review]
OBJECTIVE: The study aimed to assess the efficacy of erbium laser technology compared with traditional drilling for caries removal.

METHODS: A systematic search was conducted through Medline via PubMed, Embase, Cochrane databases, CNKI till December 2016. Randomised controlled trials, quasi-randomized controlled trials, or controlled clinical trials with data comparing the efficacy of erbium laser technology versus traditional drilling for caries removal were included.

RESULTS: Fourteen studies were selected in our meta-analysis. Erbium laser technology showed an increased time when removing caries compared with drilling (mean difference: 3.48, 95% confidence interval: 1.90-5.06, \( P < .0001 \)). However, erbium laser technology reduced the requirement for local anesthesia (risk ratio: 0.28, 95% confidence interval: 0.13-0.62, \( P = .002 \)). Erbium laser technology was also not significantly different to traditional drilling with regard to restoration loss, pulpal vitality, and postoperative sensitivity.

CONCLUSIONS: Erbium laser technology showed an increased time for cavity preparation compared with traditional drilling. However, erbium laser technology reduced the requirement for local anesthesia. There was no significant difference between erbium laser technology and traditional drilling regarding restoration loss, pulpal vitality, and postoperative sensitivity.
BACKGROUND: This manuscript presents evidence-based guidance on the use of 38 percent silver diamine fluoride (SDF) for dental caries management in children and adolescents, including those with special health care needs. A guideline workgroup formed by the American Academy of Pediatric Dentistry developed guidance and an evidence-based recommendation regarding the application of 38 percent SDF to arrest cavitated caries lesions in primary teeth.

TYPES OF STUDIES REVIEWED: The basis of the guideline's recommendation is evidence from an existing systematic review "Clinical trials of silver diamine fluoride in arresting caries among children: A systematic review."

RESULTS: The panel was unable to make a recommendation on superiority of any particular type of vital pulp therapy owing to lack of studies directly comparing these interventions. The panel recommends use of mineral trioxide aggregate (MTA) and formocresol in pulpotomy treatments; these are recommendations based on moderate-quality evidence at 24 months. The panel made weak recommendations regarding choice of medicament in both IPT (moderate-quality evidence [24 months], low quality evidence [48 months]) and DPC (very-low-quality evidence [24 months]). Success of both treatments was independent of type of medicament used. The panel also recommends use of ferric sulfate (low-quality evidence), lasers (low-quality evidence), sodium hypochlorite (very low-quality evidence), and tricalcium silicate (very low-quality evidence) in pulpotomies; these are weak recommendations based on low-quality evidence. The panel recommended against the use of calcium hydroxide as pulpotomy medicament in primary teeth with deep caries lesions. Conclusions and practical implications: The guideline intends to inform the clinical practices with evidence-based recommendations on vital pulp therapies in primary teeth with deep caries lesions. These recommendations are based upon the best available evidence to-date.

Abstract

PURPOSE: This manuscript presents evidence-based guidance on the use of vital pulp therapies for treatment of deep caries lesions in children. A guideline panel convened by the American Academy of Pediatric Dentistry formulated evidence-based recommendations on three vital pulp therapies: indirect pulp treatment (IPT; also known as indirect pulp cap), direct pulp cap (DPC), and pulpotomy.

METHODS: The basis of the guideline's recommendations was evidence from "Primary Tooth Vital Pulp Therapy: A Systematic Review and Meta-Analysis." (Pediatr Dent 2017;15:39[1]:16-23.) A systematic search was conducted in PubMed/MEDLINE, Embase, Cochrane Central Register of Controlled Trials, and trial databases to identify randomized controlled trials and systematic reviews addressing peripheral issues of vital pulp therapies such as patient preferences of treatment and impact of cost. Quality of the evidence was assessed through the Grading of Recommendations Assessment, Development, and Evaluation approach; the evidence-to-decision framework was used to formulate a recommendation.

RESULTS: The panel was unable to make a recommendation on superiority of any particular type of vital pulp therapy owing to lack of studies directly comparing these interventions. The panel recommends use of mineral trioxide aggregate (MTA) and formocresol in pulpotomy treatments; these are recommendations based on moderate-quality evidence at 24 months. The panel made weak recommendations regarding choice of medicament in both IPT (moderate-quality evidence [24 months], low quality evidence [48 months]) and DPC (very-low-quality evidence [24 months]). Success of both treatments was independent of type of medicament used. The panel also recommends use of ferric sulfate (low-quality evidence), lasers (low-quality evidence), sodium hypochlorite (very low-quality evidence), and tricalcium silicate (very low-quality evidence) in pulpotomies; these are weak recommendations based on low-quality evidence. The panel recommended against the use of calcium hydroxide as pulpotomy medicament in primary teeth with deep caries lesions. Conclusions and practical implications: The guideline intends to inform the clinical practices with evidence-based recommendations on vital pulp therapies in primary teeth with deep caries lesions. These recommendations are based upon the best available evidence to-date.
BDA LIBRARY MEDLINE SEARCH

RECENT REVIEWS RELATED TO DENTAL CARIES

VI 1
Status
In-Process
Authors
Duangthip D; Man A; Poon PH; Lo ECM; Chu CH.
Authors Full Name
Duangthip, Duangporn; Man, Arthur; Poon, Pak Hong; Lo, Edward Chin Man; Chu, Chun-Hung.
Institution
Duangthip, Duangporn. Faculty of Dentistry, The University of Hong Kong, Hong Kong, China.
Man, Arthur. Faculty of Dentistry, The University of Hong Kong, Hong Kong, China.
Poon, Pak Hong. Faculty of Dentistry, The University of Hong Kong, Hong Kong, China.
Lo, Edward Chin Man. Faculty of Dentistry, The University of Hong Kong, Hong Kong, China.
Chu, Chun-Hung. Faculty of Dentistry, The University of Hong Kong, Hong Kong, China.
Title
Occlusal stress is involved in the formation of non-carious cervical lesions. A systematic review of abfraction. [Review]
Source
Local Messages
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Abstract
PURPOSE: This systematic review on abfraction studied whether stress is a mechanism in the formation of non-carious cervical lesions (NCCLs).

METHODS: A literature search was performed on three electronic databases (PubMed, ISI Web of Science, and EMBASE) using the keyword “abfraction” in publications published in English. The inclusion criteria were clinical and laboratory studies that investigated the role of abfraction in NCCLs. The title and abstract of the identified publications were screened by two investigators independently. Reviews, case reports, and irrelevant papers were excluded. Full text of the remaining publications were retrieved. A manual search was performed on the bibliographies of the selected publications to identify additional relevant publications for review.

RESULTS: A total of 372 publications were identified, and 165 duplicated publications and 166 irrelevant publications were excluded. From the bibliographies of the remaining 41 publications, 28 relevant publications were found. Therefore, 69 publications (31 clinical studies and 38 laboratory studies) were included in this review and the majority (56/69, 81%) found an association between occlusal stress and NCCLs. Although no clinical study demonstrated that NCCL was caused by stress alone, 23 studies reported that stress or occlusal factors were associated with NCCLs. Of the 38 laboratory studies, 24 that used finite element analysis found that stress was concentrated at the cervical region of the tooth. Nine laboratory studies suggested that stress was a mechanism for NCCLs, whereas five studies reported the opposite. In conclusion, current literature supported an association between occlusal stress and NCCLs.

CLINICAL SIGNIFICANCE: This systematic review of abfraction found the majority of studies reported an association between occlusal stress and non-carious cervical lesions.

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Authors
Dhar V; Marghalani AA; Crystal YO; Kumar A; Ritwik P; Tulunoglu O; Graham L.
Authors Full Name
Dhar, Vineet; Marghalani, Abdullah A; Crystal, Yasmi O; Kumar, Ashok; Ritwik, Priyanshi; Tulunoglu, Ozlem; Graham, Laurel.
Institution
Dhar, Vineet. VPT workgroup chair, is a clinical associate professor and chief, Division of Pediatric Dentistry, University of Maryland School of Dentistry, Baltimore, Md., USA.
Marghalani, Abdullah A. Pediatric dental fellow, Division of Pediatric Dentistry, at the University of Maryland School of Dentistry, Baltimore, Md., USA.
Crystal, Yasmi O. Clinical associate professor of pediatric dentistry, at NYU College of Dentistry, New York, N.Y., USA; and a pediatric dentist in private practice, in New Jersey, N.J. and New York City, N.Y., USA.
Kumar, Ashok. Clinical associate professor of pediatric dentistry, at The Ohio State University College of Dentistry; and a director of Dental Clinic Operations, Nation-wide Children's Hospital, Columbus, Ohio, USA.
Ritwik, Priyanshi. Associate professor, Department of Pediatric Dentistry, at the Louisiana State University School of Dentistry New Orleans, La., USA.
Tulunoglu, Ozlem. Full-time faculty, Department of Pediatric Dentistry, at Case Western Reserve University, School of Dental Medicine, Cleveland, Ohio, USA.
Graham, Laurel. Senior evidence-based dentistry manager, American Academy of Pediatric Dentistry, Chicago, Ill., USA.; Email: lgraham@aapd.org.
Title
Use of Vital Pulp Therapies in Primary Teeth with Deep Caries Lesions.
Source
BACKGROUND: This manuscript presents evidence-based guidance on the use of vital pulp therapies for treatment of deep caries lesions in children. A guideline panel convened by the American Academy of Pediatric Dentistry formulated evidence-based recommendations on three vital pulp therapies: indirect pulp treatment (IPT; also known as indirect pulp cap), direct pulp cap (DPC), and pulpotomy.

METHODS: The basis of the guideline's recommendations was evidence from "Primary Tooth Vital Pulp Therapy: A Systematic Review and Meta-Analysis." (Pediat Dent 2017;15:39[1]:16-23.) A systematic search was conducted in PubMed/MEDLINE, Embase, Cochrane Central Register of Controlled Trials, and trial databases to identify randomized controlled trials and systematic reviews addressing peripheral issues of vital pulp therapies such as patient preferences of treatment and impact of cost. Quality of the evidence was assessed through the Grading of Recommendations Assessment, Development, and Evaluation approach; the evidence-to-decision framework was used to formulate a recommendation.

RESULTS: The panel was unable to make a recommendation on superiority of any particular type of vital pulp therapy owing to lack of studies directly comparing these interventions. The panel recommends use of mineral trioxide aggregate (MTA) and formocresol in pulpotomy treatments; these are recommendations based on moderate-quality evidence at 24 months. The panel made weak recommendations regarding choice of medicament in both IPT (moderate-quality evidence [24 months]), low quality evidence [48 months]) and DPC (very-low quality evidence [24 months]). Success of both treatments was independent of type of medicament used. The panel also recommends use of ferric sulfate (low-quality evidence), lasers (low-quality evidence), sodium hypochlorite (very low-quality evidence), and tricalcium silicate (very low-quality evidence) in pulpotomies; these are weak recommendations based on low-quality evidence. The panel recommended against the use of calcium hydroxide as pulpotomy medicament in primary teeth with deep caries lesions. Conclusions and practical implications: The guideline intends to inform the clinical practices with evidence-based recommendations on vital pulp therapies in primary teeth with deep caries lesions. These recommendations are based upon the best available evidence to-date.

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Journal Article.
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2017
BACKGROUND: Dental caries (tooth decay) is one of the most common chronic childhood diseases. Caries prevalence in most industrialised countries has declined among children over the past few decades. The probable reasons for the decline are the widespread use of fluoride toothpaste, followed by artificial water fluoridation, oral health education and a slight decrease in sugar consumption overall. However, in regions without water fluoridation, fluoride supplementation for pregnant women may be an effective way to increase fluoride intake during pregnancy. If fluoride supplements taken by pregnant women improve neonatal outcomes, pregnant women with no access to a fluoridated drinking water supply can obtain the benefits of systemic fluoridation through the application of 38 percent SDF to enhance dental caries management outcomes in children and adolescents, including those with special health care needs. These recommended practices are based upon the best available evidence to-date. A 38 percent SDF protocol is included in Appendix II.

OBJECTIVES: To evaluate the effects of women taking fluoride supplements (tablets, drops, lozenges or chewing gum) compared with no fluoride supplementation during pregnancy to prevent caries in the primary teeth of their children.

SEARCH METHODS: Cochrane Oral Health’s Information Specialist searched the following databases: Cochrane Oral Health’s Trials Register (to 25 January 2017); the Cochrane Central Register of Controlled Trials (CENTRAL; 2016, Issue 11) in the Cochrane Library (searched 25 January 2017); MEDLINE Ovid (1946 to 25 January 2017); Embase Ovid (1980 to 25 January 2017); LILACS BIREME Virtual Health Library (Latin American and Caribbean Health Science Information database; 1982 to 25 January 2017); and CINAHL EBSCO (Cumulative Index to Nursing and Allied Health Literature; 1937 to 25 January 2017). We searched the US National Institutes of Health Ongoing Trials Register (ClinicalTrials.gov) and the World Health Organization International Clinical Trials Registry Platform for ongoing trials to 25 January 2017. No restrictions were placed on the language or date of publication when searching the electronic databases.

SELECTION CRITERIA: Randomised controlled trials (RCTs) of fluoride supplements (tablets, drops, lozenges or chewing gum) administered to women during pregnancy with the aim of preventing caries in the primary teeth of their children.

DATA COLLECTION AND ANALYSIS: Two review authors independently screened the titles and abstracts (when available) of all reports identified through electronic searches. Two review authors independently extracted data and assessed risk of bias, as well as evaluating overall quality of the evidence utilising the GRADE approach. We could not conduct data synthesis as only one study was included in the analysis.

MAIN RESULTS: Only one RCT met the inclusion criteria for this review. This RCT showed no statistical difference on decayed or filled primary tooth surfaces (dfs) and the percentage of children with caries at 3 years (risk ratio (RR) 1.46, 95% confidence interval (CI) 0.75 to 2.85; participants = 938, very low quality of evidence) and 5 years old (RR 0.84, 95% CI 0.53 to 1.33; participants = 798, very low quality of evidence). The incidence of fluorosis at 5 years was similar between the group taking fluoride supplements (tablets) during the last 6 months of pregnancy and the placebo group.
AUTHORS' CONCLUSIONS: There is no evidence that fluoride supplements taken by women during pregnancy are effective in preventing dental caries in their offspring.

Authors Full Name
Chibinski, Ana Claudia; Wambier, Leticia Maira; Feltrin, Juliana; Loguercio, Alessandro Dourado; Wambier, Denise Stadler; Reis, Alessandra.

Institution
Chibinski, Ana Claudia. Department of Dentistry, State University of Ponta Grossa, Ponta Grossa, Brazil.

Title
Silver Diamine Fluoride Has Efficacy in Controlling Caries Progression in Primary Teeth: A Systematic Review and Meta-Analysis.

Source

Abstract
A systematic review was performed to evaluate the efficacy of silver diamine fluoride (SDF) in controlling caries progression in children when compared with active treatments or placebos. A search for randomized clinical trials that evaluate the effectiveness of SDF for caries control in children compared to active treatments or placebos with follow-ups longer than 6 months was performed in PubMed, Scopus, Web of Science, LILACS, BBO, Cochrane Library, and grey literature. The risk of bias tool from the Cochrane Collaboration was used for quality assessment of the studies. The quality of the evidence was evaluated using the GRADE approach. Meta-analysis was performed on studies considered at low risk of bias. A total of 5,980 articles were identified. Eleven remained in the qualitative synthesis. Five studies were at "low," 2 at "unclear," and 4 studies at "high" risk of bias in the key domains. The studies from which the information could be extracted were included for meta-analysis. The arrestment of caries at 12 months promoted by SDF was 66% higher (95% CI 41-91%; p < 0.00001) than by other active material, but it was 154% higher (95% CI 67-85%; p < 0.00001) than by placebos. Overall, the caries arrestment was 89% higher (95% CI 49-138%; p < 0.00001) than using active materials/placebo. No heterogeneity was detected. The evidence was graded as high quality. The use of SDF is 89% more effective in controlling/arresting caries than other treatments or placebos. The quality of the evidence was graded as high.

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Authors Full Name
Gold, Jaana.

Title
Limited Evidence Links Silver Diamine Fluoride and Caries Arrest in Children.

Source

Abstract

SOURCE OF FUNDING: Academic research funding from the General Research Fund of the Research Grants Council of Hong Kong TYPE OF STUDY/DESIGN: Systematic review and meta-analysis.

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INTRODUCTION: Dental caries is known to be one of the most widespread, chronic infections affecting all ages and populations worldwide. The plethora of oral microbial population paves way for various endogenous infections and plays a crucial role in polymicrobial interactions contributing to biofilm-mediated diseases like caries and periodontal diseases.

METHODS: Extensive literature survey was conducted using the scientific databases like PubMed, Google scholar, Science Direct, etc. using the key words like dental caries, orodental infections, dental microbes, dental biofilm, secondary caries, phytotherapy, etc. The literature was analyzed thoroughly and critical review was performed.

RESULTS: The risk of development of secondary caries and residual caries further results in treatment failure. Drug resistance developed by oral microbes and further side effects pose serious hurdles in the current therapeutic strategies. The hyperactivities of various MMPs and the resulting massive ECM degradation are the challenging part in the design of effective therapeutic approaches. Anticariogenic phytotherapy is well appreciated owing to lesser side effects and versatility of their action. But appreciable outcomes regarding the phytochemical bioavailability and bioretention are still challenging. Site-specific delivery of phytoagents at the infected site may enhance the efficiency of these drugs. Accordingly emerging phytodentistry can be promising for the management of secondary and residual caries.

CONCLUSION: This article presents major cariogens and their mechanisms in initiating and aggravating dental caries. Effectiveness of phytotherapy and different mode of action of phytochemicals against cariogens are outlined. The article also raises major concerns and possibilities of phytochemical based therapeutics to be applied in the clinical arena of caries management.

Publication Type
Journal Article. Review.

Year of Publication
2017
BACKGROUND: Early childhood caries is a disease affecting significantly both well-developed and industrial nations. The ECC can significantly affect the child's quality of life, as it may lead to infection, swelling, pain, and other symptoms. The ECC affects children after eruption of primary teeth until age of around 5 years.

REVIEW RESULTS: The ECC affects all parts of the tooth including the smooth surface. Upper anterior teeth and primary molars are usually affected. The lower anterior teeth are less likely affected. The risk factors for ECC are diet, bacteria, and host susceptibility. The additional factors, such as presence of enamel defect and the feeding practices also contribute to the initiation and progress of ECC.

CONCLUSION: Dentists must focus on utilizing existing techniques to distinguish indications of right on time and propelled caries and give guidance on the best way to counteract and control caries in children. Approaches should be directed to preventive caries control strategies among children.

CLINICAL SIGNIFICANCE: Preventing and controlling the development of ECC among children is important to maintain effective eating, speech development, and formation of a positive self-image.


BACKGROUND AND OBJECTIVES: The associations of breastfeeding and early childhood caries (ECC) risk have been evaluated in several epidemiological studies with conflicting results. We performed an update meta-analysis to estimate the association of feeding patterns, breastfeeding durations and ECC risk.

METHODOLOGY AND STUDY DESIGN: Studies were identified through searching Pubmed, Web of Science, and Embase from January 1990 to December 2015.

RESULTS: Thirty-five studies involving 73,401 participants aged 0-71 months were included. The overall analysis showed children ever breastfed had a reduced risk of ECC compared with those never breastfed (OR=0.77, 95% CI: 0.61-0.97, p=0.026). Subgroup analysis revealed ever breastfeeding significantly reduced ECC risk for the studies with 3-6 years old children (OR=0.70, 95% CI: 0.54-0.90, p=0.005), with sample size >500 subjects (OR=0.63, 95% CI: 0.46-0.87, p=0.004), with Newcastle-Ottawa Scale (NOS) score >=6 (OR=0.66, 95% CI: 0.46-0.94, p=0.023), published after 2010 (OR=0.50, 95% CI: 0.30-0.82, p=0.006), with adjusted OR (OR=0.40, 95% CI: 0.18-0.88, p=0.023). Exclusive breastfeeding did not significantly decrease ECC risk compared with bottle feeding (OR=0.68, 95% CI: 0.35-1.31, p=0.248). The children breastfed >=12 months significantly increased ECC risk compared with those breastfed <12 months (OR=1.86, 95% CI: 1.37-2.52, p=0.001). Whereas, children breastfed >=6 months did not significantly increase ECC risk compared with those breastfed <6 months (OR=1.13, 95% CI: 0.83-1.53, p=0.428).

CONCLUSIONS: Our analysis suggests ever breastfeeding may protect children from ECC, and breastfeeding duration >=12 months is associated with higher ECC risk. Additional large cohort studies are required to illustrate the relationship in further study.
Remineralisation - the buzzword for early MI caries management.

Abstract

Minimal intervention (MI) dentistry aims to preserve dental tissues first and restore only when indicated, thus remineralisation of initial (non-cavitated) caries lesions, an integral part of caries management, is an essential treatment strategy in MI. With this understanding, dental practitioners are increasingly embracing the principle of non-operative treatment of initial caries lesions. The purpose of this review was to summarise the most recent literature published in non-operative management of dental caries. Three electronic databases (MEDLINE, EMBASE, Cochrane CENTRAL) were searched, and clinical studies, systematic reviews and meta-analysis were included. This report outlines the strategies and numerous therapeutic materials available to aid in arrestment/remineralisation of initial caries lesions on root and coronal surfaces. However, the level of evidence of effect is variable, as well as the availability in different parts of the world. Options available to practitioners will vary when placing emphasis on the level of evidence supporting them. Strong clinical evidence support the effectiveness of pits/fissure sealants for therapeutic management of active initial caries on occlusal surfaces, and fluoride varnishes for remineralisation of caries lesions on root and coronal smooth surfaces, including proximal surfaces. Other materials formulated to enhance the effectiveness of any chosen remineralisation strategy were discussed. However, it is absolutely necessary that all caries remineralisation treatment be complemented with general behavioural modification in oral health through motivational interviewing directed towards change in oral hygiene to control plaque, dietary attitude modification to reduce the frequency of intake of fermentable sugars, and establishment of risk-based recall visits.

Early Childhood Caries: Prevalence, Risk Factors, and Prevention. [Review]

Abstract

Early childhood caries (ECC) is major oral health problem, mainly in socially disadvantaged populations. ECC affects infants and preschool children worldwide. The prevalence of ECC differs according to the group examined, and a prevalence of up to 85% has been reported for disadvantaged groups. ECC is the presence of one or more decayed, missing, or filled primary teeth in children aged 71months (5years) or younger. It begins with white-spot lesions in the upper primary incisors along the margin of the gingiva. If the disease continues, caries can progress, leading to complete destruction of the crown. The main risk factors in the development of ECC can be categorized as microbiological, dietary, and environmental risk factors. Even though it is largely a preventable condition, ECC remains one of the most common childhood diseases. The major contributing factors for the for the high prevalence of ECC are improper feeding practices, familial socioeconomic background, lack of parental education, and lack of access to dental care. Oral health plays an important role in children to maintain the oral functions and is required for eating, speech development, and a positive self-image. The review will focus on the prevalence, risk factors, and preventive strategies and the management of ECC.

Early childhood caries (ECC) is major oral health problem, mainly in socially disadvantaged populations. ECC affects infants and preschool children worldwide. The prevalence of ECC differs according to the group examined, and a prevalence of up to 85% has been reported for disadvantaged groups. ECC is the presence of one or more decayed, missing, or filled primary teeth in children aged 71months (5years) or younger. It begins with white-spot lesions in the upper primary incisors along the margin of the gingiva. If the disease continues, caries can progress, leading to complete destruction of the crown. The main risk factors in the development of ECC can be categorized as microbiological, dietary, and environmental risk factors. Even though it is largely a preventable condition, ECC remains one of the most common childhood diseases. The major contributing factors for the for the high prevalence of ECC are improper feeding practices, familial socioeconomic background, lack of parental education, and lack of access to dental care. Oral health plays an important role in children to maintain the oral functions and is required for eating, speech development, and a positive self-image. The review will focus on the prevalence, risk factors, and preventive strategies and the management of ECC.
Predicting trend of early childhood caries in mainland China: a combined meta-analytic and mathematical modelling approach based on epidemiological surveys.

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.
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-curious cervical lesions [NCCLs] of adults?, through a systematic review and meta-analysis.

SOURCE: MEDLINE, Scopus, Web of Science, LILACS, BBO, Cochrane Library and SIGLE were searched without restrictions, as well as the abstracts of the IADR, clinical trials registries, dissertations and theses in May 2016 (updated in April 2017).

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).

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Authors
Mishra P; Fareed N; Battur H; Khanagar S; Bhat MA; Palaniswamy J.

Authors Full Name
Mishra, Poulami. Department of Public Health Dentistry, KVG Dental College and Hospital, Sullia, Karnataka, India.
Fareed, Nusrath. Department of Public Health Dentistry, KVG Dental College and Hospital, Sullia, Karnataka, India.
Battur, Hemant. Department of Public Health Dentistry, KVG Dental College and Hospital, Sullia, Karnataka, India.
Khanagar, Sanjeev. Department of Public Health Dentistry, KVG Dental College and Hospital, Sullia, Karnataka, India.
Bhat, Manohar A. Department of Public Health Dentistry, KVG Dental College and Hospital, Sullia, Karnataka, India.
Palaniswamy, Jagan. Department of Public Health Dentistry, KVG Dental College and Hospital, Sullia, Karnataka, India.

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.

Publication Type
Journal Article. Review.
Year of Publication
2017

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

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.

Publication Type
Journal Article. Review.
Year of Publication
2017
Are people with an orofacial cleft at a higher risk of dental caries? A systematic review and meta-analysis.

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.

Single Nucleotide Polymorphism in the Aetiology of Caries: Systematic Literature Review.

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, and 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.
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Comment on the paper entitled 'Arginine and caries prevention: A systematic review'.

Source

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

Publication Type
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Authors
Chi DL; Luu M; Chu F.

Authors Full Name
Chi, Donald L; Luu, Monique; Chu, Frances.

Institution
Chi, Donald L. Oral Health Sciences, University of Washington, Seattle, WA, USA.
Luu, Monique. Oral Health Sciences, University of Washington, Seattle, WA, USA.
Chu, Frances. Oral Health Sciences, University of Washington, Seattle, WA, USA.

Title
A scoping review of epidemiologic risk factors for pediatric obesity: Implications for future childhood obesity and dental caries prevention research.

Source

Abstract
RESEARCH QUESTIONS: What are the non-modifiable (socioeconomic, genetic) and modifiable factors (physical activity, dietary behaviors) related to childhood (under age 12) obesity? How can this knowledge be applied to oral health professionals' efforts to prevent or manage dental caries in children?

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.
Effectiveness of silver diamine fluoride in caries prevention and arrest: a systematic literature review.

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.
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 karies;
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Hujoel, Philippe P. Department of Epidemiology, School of Public Health, University of Washington, Seattle, WA, USA.
Hujoel, Philippe P. Department of Oral Health Sciences, School of Dentistry, University of Washington, Seattle, WA, USA.
Lingstrom, Peter. Department of Cariology, Institute of Odontology, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden.
Title
Nutrition, dental caries and periodontal disease: a narrative review.
Source
Abstract
AIM: To provide a narrative review of the role of macro- 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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Authors
Frencken JE; Sharma P; Stenhouse L; Green D; Laverty D; Dietrich T.
Authors Full Name
Frencken, Jo E; Sharma, Praveen; Stenhouse, Laura; Green, David; Laverty, Dominic; Dietrich, Thomas.
Institution
Frencken, Jo E. Department of Oral Function and Prosthetic Dentistry, Radboud University Medical Centre, Nijmegen, The Netherlands.
Sharma, Praveen. Periodontal Research Group, College of Medical and Dental Sciences, Dental School, University of Birmingham, Birmingham, UK.
Stenhouse, Laura. Department of Special Care Dentistry, Birmingham Dental Hospital and School of Dentistry, Birmingham, UK.
Green, David. Department of Restorative Dentistry, Birmingham Dental Hospital and School of Dentistry, Birmingham, UK.
Laverty, Dominic. Department of Restorative Dentistry, Birmingham Dental Hospital and School of Dentistry, Birmingham, UK.
Dietrich, Thomas. Periodontal Research Group, College of Medical and Dental Sciences, Dental School, University of Birmingham, Birmingham, UK.
Title
Global epidemiology of dental caries and severe periodontitis - a comprehensive review.
Source
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.

Source

Abstract
AIM: Aim was to systematically review behavioural aspects in the prevention and control of dental caries and periodontal diseases at 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 report.

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 abundant than that for caries. In periodontitis, glycaemia drives oxidative stress and advanced glycation end-products may also trigger a hyper-inflammatory state. Micronutrient deficiencies, such as for vitamin C, vitamin D or vitamin B12, may be related to the onset and progression of both diseases. Functional foods or probiotics could be helpful in caries prevention and periodontal disease management, although evidence is limited and biological mechanisms are not fully elucidated. Hyposalivation, rheumatoid arthritis, smoking/tobacco use, undiagnosed or sub-optimally controlled diabetes and obesity are common acquired risk factors for both caries and periodontal diseases.
AIM: To report the evidence on the effect of mechanical and/or chemical plaque control in the simultaneous management of gingivitis and caries: a systematic review.

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 \( n = 4; \) weighted mean difference (WMD) = 1.294; 95% CI (0.445; 2.144); \( p = 0.003 \) and gingivitis scores \( n = 4; \) WMD = 1.728; 95% CI (0.631; 2.825); \( p = 0.002 \). The addition of fluoride to mechanical plaque control is relevant for caries management \( n = 5; \) WMD = 1.159; 95% 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

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.

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TYPE OF STUDY/DESIGN: Systematic review with meta-analysis of data.

Individuals Who Brush Their Teeth Infrequently May Be at Greater Risk for New Carious Lesions.


SOURCE OF FUNDING: Information not available

Clinical Practice Guidelines Proposed the Use of Pit and Fissure Sealants to Prevent and Arrest Noncavitated Carious Lesions.

Recent Reviews Related to Dental Caries


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Type of Study/Design: Systematic review with meta-analysis of data.

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Authors: Janakiram C; Deepan Kumar CV; Joseph J.

Authors Full Name: Janakiram, Chandrashekar; Deepan Kumar, C V; Joseph, Joe.

Institution: Janakiram, Chandrashekar. Department of Public Health Dentistry, Amrita School of Dentistry, Amrita Vishwa Vidyapeetham, Kochi, Kerala, India.

Deepan Kumar, C V. Department of Public Health Dentistry, Amrita School of Dentistry, Amrita Vishwa Vidyapeetham, Kochi, Kerala, India.

Joseph, Joe. Department of Public Health Dentistry, Amrita School of Dentistry, Amrita Vishwa Vidyapeetham, Kochi, Kerala, India.

Title: 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.

Publication Type: Journal Article. Review.

Year of Publication: 2017

Unique Identifier: 28178696

Status: In-Data-Review

Authors: Ellwood R; DeVizio W.

Authors Full Name: Ellwood, Roger; DeVizio, William.

Institution: Ellwood, Roger. Colgate-Palmolive Technology Center, Piscataway, NJ, USA.

Title: Comment on the Paper Entitled "Arginine and Caries Prevention: A Systematic Review".


Local Messages: THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY, TO REQUEST THIS ARTICLE FROM THE LIBRARY GO TO: https://www.bda.org/library/journals-articles/Documents/photocopy-request-form.pdf

Publication Type: Journal Article.

Year of Publication: 2017
BACKGROUND: This study aimed to produce the latest summary of the evidence for association of host genetic variants contributing to both periodontal diseases and caries.

MATERIALS AND METHODS: Two systematic searches of the literature were conducted in Ovid Medline, Embase, LILACS and Cochrane Library for large candidate gene studies (CGS), systematic reviews and genome-wide association studies reporting data on host genetic variants and presence of periodontal disease and caries.

RESULTS: A total of 124 studies were included in the review (59 for the periodontitis outcome and 65 for the caries outcome), from an initial search of 15,487 titles. Gene variants associated with periodontitis were categorized based on strength of evidence and then compared with gene variants associated with caries. Several gene variants showed moderate to strong evidence of association with periodontitis, although none of them had also been associated with the caries trait.

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.
2.5 years (range 0.5 to 5 years). In three studies, the follow-up duration was 2 years, and in two studies the participants were followed-up till 3 and 5 years, respectively. Results from all studies reported that the incidence of ECC was significantly higher among children with caries at baseline compared with caries-free children. In conclusion, the incidence of ECC is significantly higher in children with a previous history of dental caries.
Knapp, Rebecca. Academic Unit of Dental Public Health, School of Clinical Dentistry, Sheffield, UK.
Gilchrist, Fiona. Academic Unit of Oral Health and Development, School of Clinical Dentistry, Sheffield, UK.
Rodd, Helen D. Academic Unit of Oral Health and Development, School of Clinical Dentistry, Sheffield, UK.
Marshman, Zoe. Academic Unit of Dental Public Health, School of Clinical Dentistry, Sheffield, UK.

Title
Change in children's oral health-related quality of life following dental treatment under general anaesthesia for the management of dental caries: a systematic review. [Review]

Comments

Source

Abstract
BACKGROUND: Dental caries has significant impact on children and their families and may necessitate treatment under general anaesthesia (GA). The use of oral health-related quality-of-life (OHRQoL) measures enables evaluation of dental treatment from a patient's perspective.

OBJECTIVE: This systematic review aimed to assess change in OHRQoL in children following treatment under GA for the management of dental caries.

METHODS: A comprehensive search was conducted to identify articles which were assessed against inclusion criteria before data extraction. Studies involving children under 16 years, having treatment for dental caries under GA, were considered eligible. Included studies were quality assessed.

RESULTS: Twenty studies were included, which demonstrated significant heterogeneity. Most studies employed a pre-test-post-test design. All but one study relied on proxy reports of OHRQoL. Only half the studies used instruments validated in the study population. Whereas all studies reported improved OHRQoL overall, some subscales showed changes which were not significant or worsened OHRQoL. The scientific quality of the studies varied considerably.

CONCLUSION: Heterogeneity of included papers limited the conclusions which could be drawn. Treatment under GA appears to result in overall improvements in proxy-reported OHRQoL; however, there is a need for further high-quality studies employing validated, child-reported measures of OHRQoL.

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Knapp, Rebecca. Academic Unit of Dental Public Health, School of Clinical Dentistry, Sheffield, UK.
Gilchrist, Fiona. Academic Unit of Oral Health and Development, School of Clinical Dentistry, Sheffield, UK.
Rodd, Helen D. Academic Unit of Oral Health and Development, School of Clinical Dentistry, Sheffield, UK.
Marshman, Zoe. Academic Unit of Dental Public Health, School of Clinical Dentistry, Sheffield, UK.

Title
Industrial sponsorship in trials on fluoride varnish or gels for caries prevention.

Source

Abstract
OBJECTIVES: Fluoride is effective for caries prevention, but trials on fluoride varnish or gels are often industry-sponsored. We assessed trial design and findings in sponsored and non-sponsored trials on fluoride varnish and fluoride gels for caries prevention.
METHODS: Data on trials included in the most recent Cochrane Reviews on fluoride varnish and fluoride gels were extracted. Sample sizes/age/dentition, year/country of publication, follow-up, test and control, risk of bias and spin (claims of a beneficial effect that were not supported by reported data) were assessed. Studies were categorized as certainly, possibly and not sponsored, and statistically compared. Inverse-generic meta-analysis and multivariable weighted least-squares meta-regression were used to assess impact of sponsorship status on effect estimates.

RESULTS: Based on 19 nonsponsored, 14 possibly sponsored and 11 certainly sponsored trials, sponsored studies were published significantly earlier, always had >1 test group, and had significantly lower risk of spin. Caries-preventive effects were higher in earlier trials, without indication for sponsorship bias in trials published until 1990 (there were no sponsored trials afterwards). If assessing the overall body of evidence and accounting for confounders, the caries-preventive effect was significantly associated with year of publication (beta: -0.06, 95% CI: -0.10/-0.02), but not sponsorship status.

CONCLUSIONS: Industry-sponsorship bias had limited impact on the overall evidence.
OBJECTIVES: To determine if resin infiltration is an effective treatment for improving the esthetic appearance of tooth discoloration resulting from development defects of enamel (EDD) and white spot lesions (WSL) by means of a systematic review.

STUDY SELECTION: Clinical studies in patients with whitish tooth discoloration, in which the resin infiltration technique was applied, were included. Color masking was the primary outcome. The methodological quality and risk of biases of included papers was assessed using MINORS criteria for non-randomized (NRS) comparative studies and Cochrane Collaboration for randomized clinical trials (RCT).

RESULTS: From a total of 2930 articles, 17 were assessed for eligibility and 11 remained in the qualitative synthesis. Four NRS and seven RCT studies were selected, the latter consisting of four full-text studies and three conference abstracts. Two studies were excluded from the quality assessment, due to overlapping results. The number of participants (treated teeth) ranged from 18 to 21 (38-74) in the NRS, and 20-83 (20-231) in the RCT studies. Post-orthodontic WSL were the most frequent treated lesions. Initial condition was used as control in the NR studies. In the RCT, resin infiltration was compared to non treatment, remineralization, or bleaching. Overall, partial or complete color masking of affected teeth was reported immediately after resin infiltration. Only two studies followed original outcomes up to one year and reported maintenance of original color masking. Two NR studies were assessed as "moderate" and one as "high" quality. Two RCT were classified as "low" risk of bias in the chosen key domains. The remaining four studies were considered "unclear" or "high" risk of bias.

CONCLUSION: Although the partial or total masking effect of enamel whitish discoloration has been shown with resin infiltration, there is no strong evidence to support this technique based on the present clinical studies.

CLINICAL SIGNIFICANCE: Enamel whitish discolorations in esthetically compromised areas are clinically undesirable. Minimally invasive approaches used as attempts to minimize the discoloration include the resin infiltration technique. The evidence for clinical recommendation of this technique is not strong, thus, further RCT studies with long-term follow-ups should be conducted.
Aboriginal Australians experience significant disparities in oral health with even poorer outcomes reported in rural and remote areas. The high rates of preventable dental disease in Aboriginal communities are a serious concern from a social standpoint and in terms of service provision and health care expenditure. In this review, primary research literature was comprehensively reviewed. Papers were selected if they reported designing or implementing an intervention or oral health programme specific to the needs of Aboriginal communities. Twenty-one publications fulfilled the inclusion criteria with 19 different interventions being described. Interventions were categorized using a classification adapted from the work of Whitehead (2002). The review identified interventions that aimed to reduce early childhood caries, increase services to remote communities, develop the role of Aboriginal health workers, improve oral health literacy, establish water fluoridation and provide periodontal therapy. Implementing successful oral health interventions in Aboriginal communities is a challenge that is compounded by the complex interplay between psychosocial and cultural determinants. Even interventions that follow a rigorous and consultative design have a high failure rate in Aboriginal communities if upstream determinants of health are not adequately understood and addressed.

Title
Oral health interventions in Australian Aboriginal communities: a review of the literature. [Review]

Source

Abstract
Aboriginal Australians experience significant disparities in oral health with even poorer outcomes reported in rural and remote areas. The high rates of preventable dental disease in Aboriginal communities are a serious concern from a social standpoint and in terms of service provision and health care expenditure. In this review, primary research literature was comprehensively reviewed. Papers were selected if they reported designing or implementing an intervention or oral health programme specific to the needs of Aboriginal communities. Twenty-one publications fulfilled the inclusion criteria with 19 different interventions being described. Interventions were categorized using a classification adapted from the work of Whitehead (2002). The review identified interventions that aimed to reduce early childhood caries, increase services to remote communities, develop the role of Aboriginal health workers, improve oral health literacy, establish water fluoridation and provide periodontal therapy. Implementing successful oral health interventions in Aboriginal communities is a challenge that is compounded by the complex interplay between psychosocial and cultural determinants. Even interventions that follow a rigorous and consultative design have a high failure rate in Aboriginal communities if upstream determinants of health are not adequately understood and addressed.

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Authors
Al Rawahi SH; Asimakopoulou K; Newton JT.
Authors Full Name
Al Rawahi, Said Hartih; Asimakopoulou, Koula; Newton, Jonathon Timothy.
Institution
Al Rawahi, Said Hartih. Social & Behavioural Sciences Unit, Department of Population and Patient Health, Dental Institute, King's College London, Tower Wing, London, SE1 9RT, UK. said.al-rawahi@kcl.ac.uk.
Asimakopoulou, Koula. Social & Behavioural Sciences Unit, Department of Population and Patient Health, Dental Institute, King's College London, Tower Wing, London, SE1 9RT, UK.
Newton, Jonathon Timothy. Social & Behavioural Sciences Unit, Department of Population and Patient Health, Dental Institute, King's College London, Tower Wing, London, SE1 9RT, UK.
Title
Theory based interventions for caries related sugar intake in adults: systematic review. [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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27890003
VI 1
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Authors
Kanwar I; Sah AK; Suresh PK.
Authors Full Name
Kanwar, Indulata; Sah, Abhishek K; Suresh, Preeti K.
Institution
Kanwar, Indulata. University Institute of Pharmacy, Faculty of Technology, Pt. Ravishankar Shukla University, Raipur (CG), India.
Sah, Abhishek K. University Institute of Pharmacy, Faculty of Technology, Pt. Ravishankar Shukla University, Raipur (CG), India.
Suresh, Preeti K. University Institute of Pharmacy, Pt. Ravishankar Shukla University, Raipur-492010, Chhattisgarh, India.
Title
Biofilm-mediated Antibiotic-resistant Oral Bacterial Infections: Mechanism and Combat Strategies. [Review]
Source
Abstract
Oral diseases like dental caries and periodontal disease are directly associated with the capability of bacteria to form biofilm. Periodontal diseases have been associated to anaerobic Gram-negative bacteria forming a subgingival plaque (Porphyromonas gingivalis, Actinobacillus, Prevotella and Fusobacterium). Biofilm is a complex bacterial community that is highly resistant to antibiotics and human immunity. Biofilm communities are the causative agents of biological developments such as dental caries, periodontitis, peri-implantitis and causing periodontal tissue breakdown. The review recapitulates the latest advancements in treatment of clinical biofilm infections and scientific investigations, while these novel anti-biofilm strategies are still in nascent phases of development, efforts dedicated to these technologies could ultimately lead to anti-biofilm therapies that are superior to the current antibiotic treatment. This paper provides a review of the literature focusing on the studies on biofilm in the oral cavity, formation of dental plaque biofilm, drug resistance of bacterial biofilm and the antibiofilm approaches as biofilm preventive agents in dentistry, and their mechanism of biofilm inhibition.
Managing Early Childhood Caries with Atraumatic Restorative Treatment and Topical Silver and Fluoride Agents. [Review]


Abstract
Early childhood caries (ECC) is a significant global health problem affecting millions of preschool children worldwide. In general, preschool children from families with 20% of the lowest family incomes suffered about 80% of the ECC. Most, if not all, surveys indicated that the great majority of ECC was left untreated. Untreated caries progresses into the dental pulp, causing pain and infection. It can spread systemically, affecting a child's growth, development and general health. Fundamental caries management is based on the conventional restorative approach. Because preschool children are too young to cope with lengthy dental treatment, they often receive dental treatment under general anaesthesia from a specialist dentist. However, treatment under general anaesthesia poses a life-threatening risk to young children. Moreover, there are few dentists in rural areas, where ECC is prevalent. Hence, conventional dental care is unaffordable, inaccessible or unavailable in many communities. However, studies showed that the atraumatic restorative treatment had a very good success rate in treating dentine caries in young children. Silver diamine fluoride is considered safe and effective in arresting dentine caries in primary teeth. The aim of this paper is to review and discuss updated evidence of these alternative approaches in order to manage cavitated ECC.

Ecological Therapeutic Opportunities for Oral Diseases. [Review]

Microbiology Spectrum. 5(4), 2017 Aug.

Abstract
The three main oral diseases of humans, that is, caries, periodontal diseases, and oral candidiasis, are associated with microbiome shifts initiated by changes in the oral environment and/or decreased effectiveness of mucosal immune surveillance. In this review, we discuss the role that microbial-based therapies may have in the control of these conditions. Most investigations on the use of microorganisms for management of oral disease have been conducted with probiotic strains with some positive but very discrete clinical outcomes. Other strategies such as whole oral microbiome transplantation or modification of community function by enrichment with health-promoting indigenous oral strains may offer more promise, but research in this field is still in its infancy. Any microbial-based therapeutics for oral conditions, however, are likely to be only one component within a holistic preventive
strategy that should also aim at modification of the environmental influences responsible for the initiation and perpetuation of microbiome shifts associated with oral dysbiosis.

Publication Type
Journal Article. Review.
Year of Publication
2017

Title
Antimicrobial photodynamic therapy as an adjunct for treatment of deep carious lesions - A systematic review. [Review]
Source
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, 2011 until 21st June, 2016 for search terms relevant to the observed parameters, pathological condition, intervention and anatomic entity. 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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Publication Type
Year of Publication
2017

Title
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, 2011 until 21st June, 2016 for search terms relevant to the observed parameters, pathological condition, intervention and anatomic entity. 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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RECENT REVIEWS RELATED TO DENTAL CARIES

Title
Application of Metagenomic Analyses in Dentistry as a Novel Strategy Enabling Complex Insight into Microbial Diversity of the Oral Cavity. [Review]

Source

Abstract
The composition of the oral microbiome in healthy individuals is complex and dynamic, and depends on many factors, such as anatomical location in the oral cavity, diet, oral hygiene habits or host immune responses. It is estimated at present that worldwide about 2 billion people suffer from diseases of the oral cavity, mainly periodontal disease and dental caries. Importantly, the oral microflora involved in local infections may spread and cause systemic, even life-threatening infections. In search for etiological agents of infections in dentistry, traditional approaches are not sufficient, as about 50% of oral bacteria are not cultivable. Instead, metagenomic analyses are particularly useful for studies of the complex oral microbiome - both in healthy individuals, and in patients with oral and dental diseases. In this paper we review the current and future applications of metagenomic studies in evaluation of both the composition of the oral microbiome as well as its potential pathogenic role in infections in dentistry.

Publication Type
Journal Article. Review.

Year of Publication
2017

Unique Identifier
28429483

Authors
Drummond BK; Brosnan MG; Leichter JW.

Title
Management of periodontal health in children: pediatric dentistry and periodontology interface. [Review]

Source

Abstract
The oral health of children and adolescents mirrors their general health. Because oral health care is often delivered in isolation from general health care, oral signs and symptoms do not always alert practitioners to their significance beyond the mouth. An important example of this is the association of a higher risk of dental caries and periodontal disease in children and adolescents with overweight, obesity and prediabetic conditions. Oral-health practitioners need to consider the health conditions that their patients may have. This will aid in diagnosis and alert the practitioner to oral conditions that may not resolve without general health-care intervention also. This paper reviews the more common oral conditions involving periodontal health in children and adolescents, and discusses the diagnosis of these conditions, potential associated health problems and the roles of pediatric dentistry and periodontology in the management of these conditions with the goal of children entering adulthood with healthy dentitions.

Publication Type
Journal Article. Review.

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2017

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Authors
Baghaie H; Kisely S; Forbes M; Sawyer E; Siskind DJ.

Institution
Baghaie, Hooman. School of Dentistry, The University of Queensland, Herston, QLD, Australia.
Kisely, Steve. School of Medicine, The University of Queensland, Woolloongabba, QLD, Australia.
Kisely, Steve. Metro South Addiction and Mental Health Service, Brisbane, QLD, Australia.
Forbes, Malcolm. School of Medicine, The University of Queensland, Woolloongabba, QLD, Australia.
Forbes, Malcolm. School of Medicine, The University of Melbourne, Melbourne, VIC, Australia.
Sawyer, Emily. James Cook University, Townsville, QLD, Australia.
Siskind, Dan J. School of Medicine, The University of Queensland, Woolloongabba, QLD, Australia.
Siskind, Dan J. Metro South Addiction and Mental Health Service, Brisbane, QLD, Australia.

Title
A systematic review and meta-analysis of the association between poor oral health and substance abuse. [Review]
BACKGROUND AND AIMS: Substance use disorders are associated commonly with comorbid physical illness. There are fewer data on dental disease in these conditions, in spite of high rates of dry mouth (xerostomia), as well as the associated indirect or life-style effects such as poverty and lack of access to care. We compared the oral health of people with substance use disorders (SUDs) with non-using controls.

METHOD: This was a systematic search for studies from the last 35 years of the oral health of people reporting SUDs. We used MEDLINE, PsycInfo, OVID, Google Scholar, EMBASE and article bibliographies. Results were compared with the general population. Oral health was assessed in terms of dental caries and periodontal disease using the following standardized measures: the mean number of decayed, missing and filled teeth (DMFT) or surfaces (DMFS) and probing pocket depth. Non-carious tooth loss was assessed clinically.

RESULTS: We identified 28 studies that had sufficient data for a meta-analysis, comprising 4086 SU patients and 28031 controls. People with SUD had significantly higher mean scores for DMFT [mean difference = 5.15, 95% confidence interval (CI) = 2.61-7.69 and DMFS (mean difference = 17.83, 95% CI = 6.85-28.8]. They had more decayed teeth but fewer restorations, indicating reduced access to dental care. Patients with SUD also exhibited greater tooth loss, non-carious tooth loss and destructive periodontal disease compared to controls.

CONCLUSION: Patients with substance use disorders have greater and more severe dental caries and periodontal disease than the general population, but are less likely to have received dental care.

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RECENT REVIEWS RELATED TO DENTAL CARIES

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2017

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Status
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Authors
Brignardello-Petersen R.
Authors Full Name
Brignardello-Petersen, Romina.
Title
Low incidence and slow progression of caries in children consuming polyol-containing candies, but no differences important to patients consuming polyols. [Review]
Comments
Source
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Publication Type
Review. Comment.
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2017

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Unique Identifier
28449749
VI 1
Status
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Authors
Brignardello-Petersen R.
Authors Full Name
Brignardello-Petersen, Romina.
Title
No evidence of an association between caries at age 6 years and oral health-related quality of life at age 10 years. [Review]
Comments
Source
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2017

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Unique Identifier
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Authors
Brignardello-Petersen R.
Authors Full Name
Brignardello-Petersen, Romina.
Title
Breast-feeding up to 11 months associated with lower decayed, missing, and filled surfaces index and lower caries prevalence up to 4 years of age. [Review]
Comments
Comment on: Caries Res. 2016;50(5):498-507; PMID: 27606624
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RECENT REVIEWS RELATED TO DENTAL CARIES

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28390459

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**Authors**
Marghalani AA; Guinto E; Phan M; Dhar V; Tinanoff N.

**Authors Full Name**
Marghalani, Abdullah A; Guinto, Emilie; Phan, Minhthu; Dhar, Vineet; Tinanoff, Norman.

**Institution**
Marghalani, Abdullah A. Fellow, in the Department of Orthodontics and Pediatric Dentistry, University of Maryland School of Dentistry, Baltimore, Md., USA; Email: Marghalani.a@gmail.com.

Guinto, Emilie. Chief of pediatric dentistry at Malama I Ka Ola Health Center, Wailuku, Hawaii and clinical faculty for NYU Lutheran Pediatric Dentistry program-Hawaii site, Wailuku, Hawaii, USA.

Phan, Minhthu. Pediatric dentist in private practice, Main Street Children's Dentistry and Orthodontics, Glen Burnie, Md., USA.

Dhar, Vineet. Associate professor, in the Department of Orthodontics and Pediatric Dentistry, University of Maryland School of Dentistry, Baltimore, Md., USA.

Tinanoff, Norman. Professor, in the Department of Orthodontics and Pediatric Dentistry, University of Maryland School of Dentistry, Baltimore, Md., USA.

**Title**
Effectiveness of Xylitol in Reducing Dental Caries in Children. [Review]

**Source**

**Abstract**
PURPOSE: The purpose of this study was to evaluate the effectiveness of xylitol in reducing dental caries in children compared to no treatment, a placebo, or preventive strategies.

METHODS: MEDLINE via PubMed, Web of Science, and Cochrane Central Register of Controlled Trials (CENTRAL) were searched from January 1, 1995 through Sept. 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 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.

Publication Type

**Year of Publication**
2017

**Unique Identifier**
28338040

**Status**
MEDLINE

**Authors**
Shahid M.

**Authors Full Name**
Shahid, Mishel.

**Institution**
Shahid, Mishel. School of Dentistry, University of Dundee, Scotland.

**Title**
Regular supervised fluoride mouthrinse use by children and adolescents associated with caries reduction. [Review]

**Source**
Evidence-Based Dentistry. 18(1):11-12, 2017 03.

**Abstract**
Data sourcesCochrane Oral Health Group's Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL), Medline, Embase, CINAHL, LILACS, BBO, Proquest Dissertations and Theses, Web of Science Conference Proceedings, ClinicalTrials.gov and the WHO International Clinical Trials Registry Platform.Study selectionRandomised or quasi-randomised controlled trials where blind outcome assessment was stated or indicated, comparing fluoride mouthrinse with placebo or no treatment in children up to 16 years of age with a duration of at least 12 months.Data extraction and synthesisA least two
reviewers independently selected studies, abstracted data and assessed risk of bias. Results Thirty-seven trials involving 15,813 children and adolescents were included. Supervised rinsing in schools was tested in all trials. Twenty-eight studies were at high risk of bias, nine at unclear risk. Thirty-seven trials (15,305 participants) contributed data on permanent tooth surface for meta-analysis and found a prevented fraction for D(M)FS = 27% (95% CI 23% to 30%; I² = 42%) (moderate quality evidence). Meta-regression showed no significant association between estimates of D(M)FS with baseline caries severity, background exposure to fluorides, rinsing frequency or fluoride concentration. The pooled estimate of prevented fraction from 13 studies for D(M)FT = 23% (95% CI 18% to 29%; I² = 54%). There was limited information on possible adverse effects or acceptability of the treatment regimen in the included trials. Conclusions This review found that supervised regular use of fluoride mouthrinse by children and adolescents is associated with a large reduction in caries increment in permanent teeth. We are moderately certain of the size of the effect. Most of the evidence evaluated use of fluoride mouthrinse supervised in a school setting, but the findings may be applicable to children in other settings with supervised or unsupervised rinsing, although the size of the caries-preventive effect is less clear. Any future research on fluoride mouthrinses should focus on head-to-head comparisons between different fluoride rinse features or fluoride rinses against other preventive strategies, and should evaluate adverse effects and acceptability.

Publication Type
Comparative Study. Journal Article. Review.
Year of Publication
2017
School-based dental sealant program was effective in preventing carious lesions in first molars. [Review]


Title
School-based dental sealant program was effective in preventing carious lesions in first molars. [Review]

Comments

Source

Local Messages
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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. [Review]

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

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 I<sup>2</sup> 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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Cell responses to cariogenic microorganisms and dental resin materials—Crosstalk at the dentin-pulp interface? [Review]

Source

Local Messages
THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY, BDA MEMBERS CAN ALSO ACCESS THIS JOURNAL ONLINE FROM 2011 TO DATE. Go to www.bda.org/ejournals

Abstract
OBJECTIVE: Resin monomers released from unpolymerized dental adhesives or composites and bacterial products like lipopolysaccharide (LPS) or lipoteichoic (LTA) are simultaneously present in specific applications following treatment of deep caries lesions. This review is focused on evidence concerning cell responses as a result of the interactions between adaptive mechanisms activated by resin monomers and signaling pathways of the immune response triggered by LPS or LTA originating from cariogenic microorganisms.

METHODS: Current understanding of dental caries progression and pathways in eukaryotic cells in response to LPS stimulation in a clinical situation as well as cell reactions to oxidative stress caused by resin monomers is analyzed based on publications available through online databases.

RESULTS: LPS and LTA activate the redox-sensitive transcription factor NF-kappaB as a major regulator in immunocompetent dental pulp cells. Cell reactions to LPS/LTA associated with oxidative stress are downregulated by the redox-sensitive transcription factor Nrf2. Thus, activation of Nrf2 through resin monomer-induced oxidative stress due to the increased formation of reactive oxygen species (ROS) could be a molecular mechanism underlying the inhibition of LPS-stimulated responses such as the release of pro- or anti-inflammatory cytokines. Likewise, crosslinking of NF-kappaB and Nrf2-regulated biocompatibility pathways regulates cell death induced by the interaction of LPS and resin monomers.

SIGNIFICANCE: A multidimensional scenario through independent but linked NF-kappaB- and Nrf2-regulated pathways is activated in the clinical situation of caries treatment. Unfavorable or beneficial consequences strictly depend on a wide range of combinations and concentrations of bacterial products and resin monomers.

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Authors
Sroussi HY; Epstein JB; Bensadoun RJ; Saunders DP; Lalla RV; Migliorati CA; Heaivilin N; Zumsteg ZS.

Author NameID
Sroussi, Herve Y; ORCID: http://orcid.org/0000-0003-3447-299X
Zumsteg, Zachary S; ORCID: http://orcid.org/0000-0001-7484-3631

Authors Full Name
Sroussi, Herve Y; Epstein, Joel B; Bensadoun, Rene-Jean; Saunders, Deborah P; Lalla, Rajesh V; Migliorati, Cesar A; Heaivilin, Natalie; Zumsteg, Zachary S.

Institution
Sroussi, Herve Y. Division of Oral Medicine & Dentistry, Brigham and Women's Hospital, Boston, MA.
Epstein, Joel B. Samuel Oschin Comprehensive Cancer Institute, Cedars-Sinai Medical Center, Los Angeles, CA.
Epstein, Joel B. Division of Otolaryngology and Head and Neck Surgery, Duarte, California.
Bensadoun, Rene-Jean. Centre de Haute Energie, 10, Bd Pasteur, 06000, Nice, France.
Saunders, Deborah P. Department of Dental Oncology, Health Sciences North, Northeastern Cancer Centre, Sudbury, Ontario, Canada.
Lalla, Rajesh V. Section of Oral Medicine, University of Connecticut Health, Farmington, Connecticut.
Migliorati, Cesar A. Department of Oral and Maxillofacial Diagnostic Sciences, University of Florida, Gainesville, Florida.
Heaivilin, Natalie. Oral Maxillofacial Surgery Department, University of California, San Francisco, California.
Zumsteg, Zachary S. Department of Radiation Oncology, Cedars-Sinai Medical Center, Los Angeles, California, 90048.

Title
Common oral complications of head and neck cancer radiation therapy: mucositis, infections, saliva change, fibrosis, sensory dysfunctions, dental caries, periodontal disease, and osteoradionecrosis. [Review]

Source

Abstract
Patients undergoing radiation therapy for the head and neck are susceptible to a significant and often abrupt deterioration in their overall health. The oral morbidities of radiation therapy include but are not limited to an increased susceptibility to dental caries and periodontal disease. They also include profound and often permanent functional and sensory changes involving the oral soft tissue. These changes range from oral mucositis experienced during and soon after treatment, mucosal opportunistic infections, neurosensory disorders, and tissue fibrosis. Many of the oral soft tissue changes following radiation therapy are difficult challenges to the patients and their caregivers and require life-long strategies to alleviate their deleterious effect on basic life functions and on the quality of life. We discuss the presentation, prognosis, and management strategies of the dental structure and oral soft tissue morbidities resulting from the administration of therapeutic radiation in head and neck patient. A case for a collaborative and
integrated multidisciplinary approach to the management of these patients is made, with specific recommendation to include knowledgeable and experienced oral health care professionals in the treatment team.

Comparison between published clinical success of direct resin composite restorations in vital posterior teeth in 1995-2005 and 2006-2016 periods. [Review]

Atraumatic restorative treatment versus conventional restorative treatment for managing dental caries. [Review]
PURPOSE: To evaluate the effects of Atraumatic Restorative Treatment (ART) compared with conventional treatment for managing dental caries lesions in the primary and permanent teeth of children and adults.

SEARCH METHODS: Cochrane Oral Health's Information Specialist searched the following databases: Cochrane Oral Health's Trials Register (to 22 February 2017), the Cochrane Central Register of Controlled Trials (CENTRAL) (the Cochrane Library, 2017, Issue 1), MEDLINE Ovid (1946 to 22 February 2017), Embase Ovid (1980 to 22 February 2017), LILACS BIREME Virtual Health Library (Latin American and Caribbean Health Science Information database; 1982 to 22 February 2017) and BBO BIREME Virtual Health Library (Bibliografia Brasileira de Odontologia; 1986 to 22 February 2017). The US National Institutes of Health Trials Registry (ClinicalTrials.gov) and the World Health Organization International Clinical Trials Registry Platform were searched for ongoing trials. No restrictions were placed on the language or date of publication when searching the electronic databases.

SELECTION CRITERIA: We included randomised controlled trials (RCTs) with at least six months' follow-up that compared the effects of ART with a conventional restorative approach using the same or different restorative dental materials to treat caries lesions.

DATA COLLECTION AND ANALYSIS: Two review authors independently screened search results, extracted data from included studies and assessed the risk of bias in those studies. We used standard methodological procedures expected by Cochrane to evaluate risk of bias and synthesise data. Where pooling was appropriate we conducted meta-analyses using the random-effects model. We assessed the quality of the evidence using GRADE criteria.

MAIN RESULTS: We included a total of 15 eligible studies randomising 3760 participants in this review. The age of participants across the studies ranged from 3 to 101 years, with a mean of 25.42 years. 48% of participants were male. All included studies were published between 2002 and 2016. Two of the 15 studies declared that the financial support was from companies that manufacture restorative material. Five studies were individually randomised parallel-group studies; six were cluster-randomised parallel-group studies; and four were randomised studies that used a split-mouth design. Eleven studies evaluated the effects of ART on primary teeth only, and four on permanent teeth. The follow-up period of the included studies ranged from 6 months to 36 months. We judged all studies to be at high risk of bias.

For the main comparison of ART compared to conventional treatment using the same material: all but two studies used high-viscosity glass ionomer (H-GIC) as the restorative material; one study used a composite material; and one study used resin-modified glass ionomer cement (RM-GIC). Compared to conventional treatment using H-GIC, ART may increase the risk of restoration failure in the primary dentition, over a follow-up period from 12 to 24 months (OR 1.60, 95% CI 1.13 to 2.27; five studies; 643 participants analysed; low-quality evidence). Our confidence in this effect estimate is limited due to serious concerns over risk of performance and attrition bias. For this comparison, ART may reduce pain during procedure compared with conventional treatment (MD -0.65, 95% CI -0.94 to 0.04; six studies; 643 participants analysed; low-quality evidence). Comparisons of ART to conventional treatment using composite or RM-GIC were downgraded to very low quality due to indirectness, imprecision and high risk of performance and attrition bias. Given the very low quality of the evidence from single studies, we are uncertain about the restoration failure of ART compared with conventional treatment using composite over a 24-month follow-up period (OR 1.11, 95% CI 0.54 to 2.29; one study; 57 participants) and ART using RM-GIC in the permanent teeth of older adults with root caries lesions over a six-month follow-up period (OR 2.71, 95% CI 0.94 to 7.81; one study; 64 participants). No studies reported on adverse events or costs.

AUTHORS' CONCLUSIONS: Low-quality evidence suggests that ART using H-GIC may have a higher risk of restoration failure than conventional treatment for caries lesions in primary teeth. The effects of ART using composite and RM-GIC are uncertain due to the very low quality of the evidence and we cannot rely on the findings. Most studies evaluated the effects of ART on the primary dentition. Well-designed RCTs are required that report on restoration failure at clinically meaningful time points, as well as participant-reported outcomes such as pain and discomfort. Due to the potential confounding effects from the use of different dental materials, a robust body of evidence on the effects of ART compared with conventional treatment using the same restoration material is necessary. We identified four ongoing trials that could provide further insights into this area.
MATERIALS AND METHODS: Searches were performed using the following databases: PubMed MEDLINE, Web of Science, Bireme, Scopus and The Cochrane Library. Only 5 studies were eligible for inclusion. The quality assessment and bias control of the studies were carried out based on the Fowkes and Fulton Guideline. The study concept was first registered in the international prospective register of systematic reviews (PROSPERO).

RESULTS: Flossing was professionally performed in one study and self-reported (by parents or by the children) through questionnaires in all other 4 studies. In the first study, the authors concluded that daily interdental flossing resulted in a significant reduction in the incidence of proximal caries in deciduous teeth during a 20-month period. Two cross-sectional studies found that the use of interdental floss did not show any relevant association with the prevalence of caries; one study found that a higher the frequency of flossing was associated with higher caries experience, and the other found an association between severe caries and the use of dental floss, independently of the flossing frequency.

CONCLUSION: There is only one study in the current literature showing evidence of an association between the use of dental floss and proximal caries reduction on primary dentition. However, the use of dental floss should never be discouraged. Healthy habits acquired in childhood continue throughout adult life, with numerous oral- and general-health benefits.
**SYSTEMATIC REVIEW ON HIGHLY VISCOUS GLASS-IONOMER CEMENT/RESIN COATING RESTORATIONS (PART II): DO THEY MERGE MINAMATA CONVENTION AND MINIMUM INTERVENTION DENTISTRY?. [Review]**

**BACKGROUND:** With the Minamata Convention the use of mercury will be phased down, and this undoubtedly will have an effect on dental treatment regimens and economic resources. Composite resin restorations are considered viable alternatives to amalgam fillings; however, these will not be covered completely by health insurance systems in many countries. Recently, a high-viscosity glass-ionomer cement (hvGIC) processed with a resinous coating (RC) has been introduced, and has been marketed as a restorative material in load-bearing Class I cavities (and in Class II cavities with limited size), thus serving as a possible alternative to amalgam fillings.

**OBJECTIVE:** To discuss the outcome based on the evaluation presented in Part I of this paper, and to critically appraise the methodologies of the various studies.

**RESULTS:** Two of the included studies were industry-funded, and status of the other clinical trials remained unclear. Quality of study reporting was considered perfectible. The use of a light-cured nano-filled resin coating material would seem advantageous, at least when regarding short- and medium term outcomes.

**CONCLUSION:** Within the respective indications and cavity geometries, the hvGIC/RC approach would seem promising, could merge the phase-down of mercury and the objectives of minimally invasive treatment to some extent, and might be a restorative alternative for patients suffering from allergies or not willing to afford other sophisticated or expensive techniques. These recommendations are based on studies evaluating EQUIA Fil (GC), but are not transferable to clinical perspectives of the glass hybrid successor product (EQUIA Forte; GC).
studies. Results: Seven studies were included, five conducted in children and two in adults. The two adult studies and one child study were considered to be at high risk of bias. The remaining four child studies were considered to be at moderate risk of bias. These four studies compared 1450ppm fluoride toothpaste with 1.5% arginine against 1450ppm fluoride toothpaste as a control. Meta-analysis of three studies showed a positive effect on caries measured using quantitative light-induced fluorescence (QLF) in favour of arginine; mean difference -4.67, (95%CI, -6.34 to -3.01). The overall GRADE assessment of this was considered to be very low. Conclusion: At present there is insufficient evidence in support of a caries-preventive effect for the inclusion of arginine in toothpastes. More rigorous studies, and studies which are less dependent on commercial interests, are required.

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Authors
Foulds H.
Authors Full Name
Foulds, Hayley.
Institution
Foulds, Hayley. Department of Paediatric Dentistry, Glasgow Dental Hospital and School & the Royal Hospital for Children, Glasgow, Scotland.
Title
Developmental defects of enamel and caries in primary teeth.
Comments
Comment on: J Dent. 2017 May;60:1-7; PMID: 28347809
Source
Evidence-Based Dentistry. 18(3):72-73, 2017 10 27.
Abstract
Data sourcesPubMed, Web of Knowledge, Scopus and Scielo. Study selection Two reviewers identified studies supervised by a third. Observational studies which investigated the association between developmental defects of enamel and dental caries in the primary dentition, which were assessed by clinical examination and published in English, Spanish or Portuguese. Data extraction and synthesis Quality of research was assessed using the critical appraisal checklist from the Joanna Briggs Institute. Meta-analysis was conducted using crude and adjusted association measures (relative risk and odds ratio) with 95% confidence intervals. Combined results were presented as pooled odds ratio, and where necessary were estimated using fixed and random effect models. If heterogeneity was encountered in results, a random effect model was used. Bias was assessed using a funnel plot and the Egger test. Results: Eighteen studies were included in the systematic review and sixteen in meta-analysis; two out of the 16 were cohort studies, the rest being cross-sectional. Twelve of the studies included were conducted in low-income countries. The Egger test showed a degree of bias in some of the studies included. The authors found children with diffuse opacities or hypoplasia had higher odds of having dental caries (OR 1.42, 95% CI: 1.15-1.76; OR 4.29% CI 2.24-8.15), however the presence of demarcated opacities did not show higher odds of caries (OR 2.62, 95% CI 0.85-8.12). Conclusions: The findings demonstrated an association between developmental defects of enamel and dental caries in the primary dentition. A preventive approach to dental caries and attention to children with enamel defects appears as a useful health promotion and public health strategy. At the individual level, clinicians should be aware that children with enamel defects could require more frequent visits to the dental office in order to reduce the risk of dental caries.

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Authors
Hahn TW; Kraus C; Hooper-Lane C.
Authors Full Name
Hahn, Thomas W; Kraus, Connie; Hooper-Lane, Christopher.
Institution
Hahn, Thomas W. University of Wisconsin School of Medicine and Public Health, Department of Family Medicine and Community Health, Madison, WI, USA.
Kraus, Connie. University of Wisconsin School of Medicine and Public Health, Department of Family Medicine and Community Health, Madison, WI, USA.
Hooper-Lane, Christopher. University of Wisconsin-Madison School of Medicine and Public Health, Ebling Library, Madison, WI, USA.
Title
Clinical Inquiries: What is the optimal frequency for dental checkups for children and adults?. [Review]
Source
Abstract
IT IS UNCLEAR, but studies suggest that it should be based largely on individual risk. The American Academy of Pediatric Dentistry recommends a 6-month interval for preventive dental visits (strength of recommendation [SOR]: C, expert opinion), but a 24-month interval does not result in an increased incidence of dental caries in healthy children and young adults or increased incidence of gingivitis in healthy adults (SOR: B, a single randomized controlled trial [RCT]). In adults with risk factors (e.g., smoking or diabetes), visits at 6-month intervals are associated with a lower incidence of tooth loss (SOR: C, a retrospective cohort study). Children with risk factors (e.g., caries) may benefit from a first dental visit by age 3 years (SOR: C, a retrospective cohort study).

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Authors
Henry JA; Muthu MS; Swaminathan K; Kirubakaran R.

Authors Full Name
Henry, Jean Aishwarya; Muthu, Murugan S; Swaminathan, Kavitha; Kirubakaran, Richard.

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

Source

Abstract
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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Authors
Schwendicke F; Innes N; Levey C; Lamont T; Gostemeyer G.

Authors Full Name
Schwendicke, Falk; Innes, Nicola; Levey, Colin; Lamont, Thomas; Gostemeyer, Gerd.

Institution
Schwendicke, Falk. Department of Operative and Preventive Dentistry, Charite - Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health, Assmannshauser Str. 4-6, 14197 Berlin, Germany.
Innes, Nicola. Department of Paediatric Dentistry, Dundee Dental Hospital and School, University of Dundee, Park Place, Dundee, Scotland DD1 4HN, UK.
Levey, Colin. Department of Restorative Dentistry, Dundee Dental Hospital and School, University of Dundee, Park Place, Dundee, Scotland DD1 4HN, UK.
Lamont, Thomas. Department of Restorative Dentistry, Dundee Dental Hospital and School, University of Dundee, Park Place, Dundee, Scotland DD1 4HN, UK.
Gostemeyer, Gerd. Department of Operative and Preventive Dentistry, Charite - Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health, Assmannshauser Str. 4-6, 14197 Berlin, Germany. Electronic address: Gerd.Goestemeyer@charite.de.

Title
Comparator choice in cariology trials limits conclusions on the comparative effectiveness of caries interventions. [Review]

Source
OBJECTIVES: Comparator choice has been found as one major factor impacting on the overall evidence supporting clinical interventions. We performed social network analysis (SNA) on trials on the prevention/management of caries/carious lesions, hypothesizing that certain comparators are proportionally overinvestigated, and others underinvestigated, and that comparisons within comparator classes are preferred over comparisons between classes.

STUDY DESIGN AND SETTING: A systematic review of randomized controlled trials on the prevention/management of caries/existing carious lesions was carried out. All comparators were classified at each of three levels of granularity, becoming more detailed with each level: (1) degree of invasiveness (noninvasive, microinvasive, or invasive), (2) the specific noninvasive, microinvasive, or invasive approach, and (3) the actual material or technique used. SNA was used to evaluate trial networks.

RESULTS: Searching electronic databases found 4,774 articles; of which, 764 were relevant and 605 were included. The networks for all levels were polygonal. There was a high degree of separation of comparisons in prevention vs. management trials. Invasive comparators were tested most frequently (number of comparators: 592), mainly in management trials. Noninvasive comparators were tested next often (464), mainly in caries prevention. Microinvasive strategies were tested next often (234), in both prevention and management trials. On more granular levels, few interventions dominated the networks. Regardless of the level, most trials compared within and not between classes. Prevention trials were mainly conducted in children (number of trials in adults/children/both: 37/240/11), whereas those on managing lesions were conducted in both children and adults (117/176/21).

CONCLUSION: Comparator choice in cariology trials is driven by indication and limits conclusions on the true comparative effectiveness of all strategies. There are a variety of comparators that have not been, but should be, compared with one another, which should be addressed by future trials. Factors underlying trialists' comparator choice need to be identified.
Group 2 received FV (n = 73, 17.5%) versus FS (n = 82, 20.4%). A smaller proportion of children who received FV (n = 73, 17.5%) versus FS (n = 82, 20.4%) developed caries into dentine on at least 1 FPM (odds ratio [OR] = 0.84; 95% CI, 0.59 to 1.21; P = 0.35), a nonstatistically significant difference between FS and FV treatments. The results were similar when the number of newly decayed teeth (OR = 0.75; 95% CI, 0.60 to 1.22) and tooth surfaces (OR = 0.85; 95% CI, 0.59 to 1.21) were examined. In a community oral health program, semiannual application of FV resulted in caries prevention that was not significantly different from that obtained by applying and maintaining FS after 36 mo (EudraCT: 2010-023476-23; ISRCTN: ISRCTN17029222).

**Title**
Fissure Seal or Fluoride Varnish? A Randomized Trial of Relative Effectiveness. [Review]

**Comments**

**Source**

**Abstract**
Fissure sealant (FS) and fluoride varnish (FV) are effective in preventing dental caries when compared with a no-treatment control. However, the relative clinical effectiveness of these interventions is uncertain. The objective of the study was to compare the clinical effectiveness of FS and FV in preventing dental caries in first permanent molars (FPMs) in 6- to 7-y-olds. The study design was a randomized clinical trial, with 2 parallel arms. The setting was a targeted-program population that used mobile dental clinics in schools located within areas of high social and economic deprivation in South Wales. A total of 1,016 children were randomized 1:1 to receive either FS or FV. Resin-based FS was applied to caries-free FPMs and maintained at 6-mo intervals. FV was applied at baseline and at 6-mo intervals for 3 y. The main outcome measures were the proportion of children developing caries into dentine (D=sub-4.6/=sub-MF) on any 1 of up to 4 treated FPMs after 36 mo. At 36 mo, 835 (82%) children remained: 417 in the FS arm and 418 in the FV arm. A smaller proportion of children who received FV (n = 73, 17.5%) versus FS (n = 82, 19.6%) developed caries into dentine on at least 1 FPM (odds ratio [OR] = 0.84; 95% CI, 0.59 to 1.21; P = 0.35), a nonstatistically significant difference between FS and FV treatments. The results were similar when the number of newly decayed teeth (OR = 0.75; 95% CI, 0.60 to 1.22) and tooth surfaces (OR = 0.85; 95% CI, 0.59 to 1.21) were examined. In a community oral health program, semiannual application of FV resulted in caries prevention that was not significantly different from that obtained by applying and maintaining FS after 36 mo (EudraCT: 2010-023476-23; ISRCTN: ISRCTN17029222).
Interventions for orthodontically induced white spot lesions: a systematic review and meta-analysis. [Review]

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).
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 root canal space may precipitate an exacerbated immune response that results in periradicular 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 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 root canal space may precipitate an exacerbated immune response that results in periradicular 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.
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.

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Authors
Maske TT; van de Sande FH; Arthur RA; Huysmans MCDNJM; Cenci MS.
Authors Full Name
Maske, T T; van de Sande, F H; Arthur, R A; Huysmans, M C D N J M; Cenci, M S.
Institution
Maske, T T. a Graduate Program in Dentistry , Federal University of Pelotas , Pelotas -RS , Brazil.
Maske, T T. b Department of Dentistry , Radboud University Medical Center , Nijmegen , the Netherlands.
van de Sande, F H. c School of Dentistry , IMED Faculdade Meridional , Passo Fundo-RS , Brazil.
Arthur, R A. d Department of Preventive and Community Dentistry , Federal University of Rio Grande do Sul , Porto Alegre-RS , Brazil.
Huysmans, M C D N J M. b Department of Dentistry , Radboud University Medical Center , Nijmegen , the Netherlands.
Cenci, M S. a Graduate Program in Dentistry , Federal University of Pelotas , Pelotas-RS , Brazil.
Title
In vitro biofilm models to study dental caries: a systematic review. [Review]
Source
Abstract
The aim of this systematic review is to characterize and discuss key methodological aspects of in vitro biofilm models for caries-related research and to verify the reproducibility and dose-response of models considering the response to anti-caries and/or antimicrobial substances. Inclusion criteria were divided into Part I (PI): an in vitro biofilm model that produces a cariogenic biofilm and/or caries-like lesions and allows pH fluctuations; and Part II (PII): models showing an effect of anti-caries and/or antimicrobial substances. Within PI, 72.9% consisted of dynamic biofilm models, while 27.1% consisted of batch models. Within PII, 75.5% corresponded to dynamic models, whereas 24.5% corresponded to batch models. Respectively, 20.4 and 14.3% of the studies reported dose-response validations and reproducibility, and 32.7% were classified as having a high risk of bias. Several in vitro biofilm models are available for caries-related research; however, most models lack validation by dose-response and reproducibility experiments for each proposed protocol.
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Authors
Hajishengallis E; Parsaei Y; Klein MI; Koo H.
Authors Full Name
Hajishengallis, E; Parsaei, Y; Klein, M I; Koo, H.
Institution
Hajishengallis, E. School of Dental Medicine, University of Pennsylvania, Philadelphia, PA, USA.
Parsaei, Y. School of Dental Medicine, University of Pennsylvania, Philadelphia, PA, USA.
Klein, M I. Araraquara Dental School, Univ Estadual Paulista, UNESP, Araraquara, Sao Paulo, Brazil.
Koo, H. School of Dental Medicine, University of Pennsylvania, Philadelphia, PA, USA.
Title
Advances in the microbial etiology and pathogenesis of early childhood caries. [Review]
Source
Molecular Oral Microbiology. 32(1):24-34, 2017 02.
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
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.
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Cenci, Maximilliano Sergio. Universidade Federal de Pelotas - Unipel, School of Dentistry, Graduate Program in Dentistry, Pelotas, RS, Brazil.
Moraes, Rafael Ratto de. Universidade Federal de Pelotas - Unipel, School of Dentistry, Graduate Program in Dentistry, Pelotas, RS, Brazil.
Opdam, Niek Johannes. Radboud University Medical Center, Radboud Institute for Health Sciences, Department of Dentistry, Nijmegen, The Netherlands.

Title
Should my composite restorations last forever? Why are they failing?. [Review]
Source
Abstract
Composites resins have become the first choice for direct anterior and posterior restorations. The great popularity is related to their esthetic appearance and reduced need of sound tissue removal as compared with former treatments. Several studies have demonstrated that composite restorations may last long in clinical service. In this review we discuss the factors playing a role on the long-term longevity. Composite restorations have demonstrated a good clinical performance with annual failure rates varying from 1% to 3% in posterior teeth and 1% to 5% in anterior teeth. Factors related to the patients such as caries risk and occlusal stress risk, in addition to socioeconomic factors, may affect the survival significantly. Characteristics of the clinical operators, particularly their decision making when it comes to observing or approaching an existing restoration, are decisive for longevity. Cavity features such as the number of restored walls, composite volume, and presence of endodontic treatment are of major importance and may dictate the service time of the restorative approach. The choice of restorative composite seems to have a minor effect on longevity provided that appropriate technical procedures are used. The main reasons for failure in posterior teeth are secondary caries and fracture (restoration or tooth/restoration), while in anterior teeth esthetic concerns are the main reasons leading to restoration failures. Composite resin restorations can be considered a reliable treatment as long as both the professional and the patient are aware of the factors involved in restoration failures.
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Authors
Wang Y; Li J; Sun W; Li H; Cannon RD; Mei L.
Author NameID
Li, Jialing; ORCID: http://orcid.org/0000-0002-2777-0035
Authors Full Name
Wang, Yu; Li, Jialing; Sun, Weibin; Li, Huang; Cannon, Richard D; Mei, Li.
Institution
Wang, Yu. Department of Preventive Dentistry, Nanjing Stomatological Hospital, Medical School of Nanjing University, Nanjing, China.
Li, Jialing. Department of Orthodontics, Nanjing Stomatological Hospital, Medical School of Nanjing University, Nanjing, China.
Sun, Weibin. Department of Periodontics, Nanjing Stomatological Hospital, Medical School of Nanjing University, Nanjing, China.
Li, Huang. Department of Orthodontics, Nanjing Stomatological Hospital, Medical School of Nanjing University, Nanjing, China.
Cannon, Richard D. Department of Oral Sciences, Sir John Walsh Research Institute, Faculty of Dentistry, University of Otago, Dunedin, New Zealand.
Mei, Li. Department of Oral Sciences, Sir John Walsh Research Institute, Faculty of Dentistry, University of Otago, Dunedin, New Zealand.

Title
Effect of non-fluoride agents on the prevention of dental caries in primary dentition: A systematic review. [Review]
Source
Abstract
OBJECTIVE: To assess the effect of non-fluoride agents on the prevention of dental caries in primary dentition.
MATERIALS AND METHODS: Medline, Web of Science, Embase, Cochrane Library, CBM and CNKI databases were searched to identify all the relevant articles published prior to 16 December 2016. Grey literature was also searched. Randomized controlled human clinical trials in which non-fluoride agents were delivered by any method were considered.
RESULTS: Of the 1,236 studies screened, 39 full articles were scrutinized and 14 selected for inclusion in the final sample. Five chemical agents, namely arginine, casein phosphopeptide-amorphous calcium phosphate (CPP-ACP), chlorhexidine, triclosan and xylitol were investigated in these included studies. The cariostatic effects of non-fluoride agents in vivo were evaluated in comparison with fluoride or placebo in randomized controlled trials. There is evidence that the use of certain doses of xylitol may be effective in arresting dental caries in primary dentition. However, quantitative synthesis could not be carried out because of the clinical and methodological heterogeneity of the included studies.
CONCLUSIONS: A study at low risk of bias indicated that daily use of xylitol wipes is a useful adjunct for caries control in young children, however, this conclusion should be interpreted with caution as this study had a very limited sample size. Chlorhexidine and CPP-ACP may be more effective than a placebo in managing caries in primary dentition, but their effectiveness is borderline when compared with fluoride. Arginine-containing mint confection and 0.3% triclosan varnish were found to reduce caries development in primary teeth but the evidence was at high risk of bias. High quality randomized controlled trials are needed in order to make a conclusive recommendation.
BACKGROUND: Dental sealants were introduced in the 1960s to help prevent dental caries, mainly in the pits and fissures of occlusal tooth surfaces. Sealants act to prevent bacteria growth that can lead to dental decay. Evidence suggests that fissure sealants are effective in preventing caries in children and adolescents compared to no sealants. Effectiveness may, however, be related to caries incidence level of the population. This is an update of a review published in 2004, 2008 and 2013.

OBJECTIVES: To compare the effects of different types of fissure sealants in preventing caries in occlusal surfaces of permanent teeth in children and adolescents.

SEARCH METHODS: Cochrane Oral Health's Information Specialist searched: Cochrane Oral Health's Trials Register (to 3 August 2016), the Cochrane Central Register of Controlled Trials (CENTRAL) (the Cochrane Library, 2016, Issue 7), MEDLINE (1946 to 3 August 2016), and Embase Ovid (1980 to 3 August 2016). We searched ClinicalTrials.gov and the World Health Organization International Clinical Trials Registry Platform for ongoing trials to 3 August 2016. No restrictions were placed on language or date of publication.

SELECTION CRITERIA: Randomised controlled trials (RCTs) comparing sealants with no sealant or a different type of sealant material for preventing caries of occlusal surfaces of premolar or molar teeth in children and adolescents aged up to 20 years. Studies required at least 12 months follow-up. We excluded studies that compared composites to resins/composites.

DATA COLLECTION AND ANALYSIS: Two review authors independently screened search results, extracted data and assessed risk of bias of included studies. We presented outcomes for caries or no caries on occlusal surfaces of permanent molar teeth as odds ratio (OR) or risk ratio (RR). We used mean difference (MD) for mean caries increment. All measures were presented with 95% confidence intervals (CI). We conducted meta-analyses using a random-effects model for comparisons where there were more than three trials; otherwise we used the fixed-effect model. We used GRADE methods to assess evidence quality.

MAIN RESULTS: We included 38 trials that involved a total of 7924 children; seven trials were new for this update (1693 participants). Fifteen trials evaluated the effects of resin-based sealant versus no sealant (3620 participants in 14 studies plus 575 tooth pairs in one study); three trials with evaluated glass ionomer sealant versus no sealant (905 participants); and 24 trials evaluated one type of sealant versus another (4146 participants). Children were aged from 5 to 16 years. Trials rarely reported background exposure to fluoride of trial participants or baseline caries prevalence. Resin-based sealant versus no sealant: second-, third- and fourth-generation resin-based sealants prevented caries in first permanent molars in children aged 5 to 10 years (at 24 months follow-up: OR 0.12, 95% CI 0.08 to 0.19, 7 trials (5 published in the 1970s; 2 in the 2010s), 1548 children randomised, 1322 children evaluated; moderate-quality evidence). If we were to assume that 16% of the control tooth surfaces were decayed during 24 months of follow-up (160 carious teeth per 1000), then applying a resin-based sealant would reduce the proportion of carious surfaces to 5.2% (95% CI 3.13% to 7.37%). Similarly, assuming that 40% of control tooth surfaces were decayed (400 carious teeth per 1000), then applying a resin-based sealant would reduce the proportion of carious surfaces to 6.25% (95% CI 3.84% to 9.63%). If 70% of control tooth surfaces were decayed, there would be 19% decayed surfaces in the sealant group (95% CI 12.3% to 27.2%). This caries-preventive effect was maintained at longer follow-up but evidence quality and quantity was reduced (e.g. at 48 to 54 months of follow-up: OR 0.21, 95% CI 0.16 to 0.28, 4 trials, 482 children evaluated; RR 0.24, 95% CI 0.12 to 0.45, 203 children evaluated). Although studies were generally well conducted, we assessed blinding of outcome assessment for caries at high risk of bias for all trials (blinding of outcome assessment is not possible in sealant studies because outcome assessors can see and identify sealant). Glass ionomer sealant versus no sealant: was evaluated by three studies. Results at 24 months were inconclusive (very low-quality evidence). One sealant versus another sealant: the relative effectiveness of different types of sealants is unknown (very low-quality evidence). We included 24 trials that directly compared two different sealant materials. Comparisons varied in terms of types of sealant assessed, outcome measures chosen and duration of follow-up. Adverse events: only four trials assessed adverse events. No adverse events were reported.

AUTHORS' CONCLUSIONS: Resin-based sealants applied on occlusal surfaces of permanent molars are effective for preventing caries in children and adolescents. Our review found moderate-quality evidence that resin-based sealants reduced caries by between 11% and 51% compared to no sealant, when measured at 24 months. Similar benefit was seen at timepoints up to 48 months; after longer follow-up, the quantity and quality of evidence was reduced. There was insufficient evidence to judge...
the effectiveness of glass ionomer sealant or the relative effectiveness of different types of sealants. Information on adverse effects was limited but none occurred where this was reported. Further research with long follow-up is needed.

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Authors
Oh HJ; Oh HW; Lee DW; Kim CH; Ahn JY; Kim Y; Shin HB; Kim CY; Park SH; Jeon JG.

Authors Full Name

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Abstract
Fluoride has been widely used for the prevention of dental caries since the mid-20th century. The aim of this study was to investigate the chronologic trends in studies on fluoride mechanisms of action against dental caries during the years 1950 to 2015. To this aim, queries such as "fluoride," "fluoride and demineralization," "fluoride and remineralization," "fluoride and (plaque or biofilms)," and "fluoride and (bacteria or microbials)" were submitted to PubMed to collect research article information, including titles, abstracts, publication dates, author affiliations, and publication journals. The article information that PubMed produced was then collected by an automatic web crawler and examined through informetrics and linguistic analyses. We found that the number of articles concerned with fluoride mechanisms of action against dental caries was 6,903 and gradually increased over time during the years 1950 to 2015. They were published by 1,136 journals-most notably, Caries Research and Journal of Dental Research. Of the articles published, those related to bacteria/microbials had a higher percentage (44%) than those dealing with plaque/biofilms, demineralization, and remineralization. With regard to the geographic distribution of authors, Europe and North America accounted for 65% of the articles during the years 1987 to 2015, although the number of authors in Asia sharply increased in recent years. Among the fluoride compounds, NaF was mentioned more frequently than SnF₂, O₃F, amine fluoride, and acidulated phosphate fluoride during the years 1986 to 2015. Water fluoridation received the most attention among the various fluoride application methods (toothpastes, mouthwashes, fluoride varnishes, and fluoride gels) during the same period. These results, obtained from employing informetrics and linguistic analyses, suggest that in studies on fluoride mechanisms of action, 1) the unbalanced geographic distribution of articles and 2) the heavy concentration of articles on particular fluoride compounds and application methods should be overcome in future research.

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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. 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 salivary proteins related to antimicrobial activity (beta defensin 1 and lysozyme), 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.
Novel approaches using OMICS techniques enable a collective assessment of multiple related biological units, including genes, gene expression, proteins, and metabolites. In the past decade, next-generation sequencing (NGS) technologies were improved by longer sequence reads and the development of genome databases and user-friendly pipelines for data analysis, all accessible at lower cost. This has generated an outburst of high-throughput data. The application of OMICS has provided more depth to existing hypotheses as well as new insights in the etiology of dental caries. For example, the determination of complete bacterial microbiomes of oral samples rather than selected species, together with oral metatranscriptome and metabolome analyses, supports the viewpoint of dysbiosis of the supragingival biofilms. In addition, metabolome studies have been instrumental in disclosing the contributions of major pathways for central carbon and amino acid metabolisms to biofilm pH homeostasis. New, often noncultured, oral streptococci have been identified, and their phenotypic characterization has revealed candidates for probiotic therapy. Although findings from OMICS research have been greatly informative, problems related to study design, data quality, integration, and reproducibility still need to be addressed. Also, the emergence and continuous updates of these computationally demanding technologies require expertise in advanced bioinformatics for reliable interpretation of data. Despite the obstacles cited above, OMICS research is expected to encourage the discovery of novel caries biomarkers and the development of next-generation diagnostics and therapies for caries control. These observations apply equally to the study of other oral diseases.
Dental caries and quality of life of preschool children: discriminant validity of the ECOHIS. [Review]

PURPOSE: 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.

Restorative Treatment Decisions in Posterior Teeth: A Systematic Review. [Review]

PURPOSE: To determine the stage of caries in posterior permanent teeth at which dentists decide to intervene invasively.

MATERIALS AND METHODS: A search of the literature from January 1980 to November 2015 available in MEDLINE-PubMed, EMBASE, and the Cochrane Library was conducted. The main search terms used were decision-making, restorative treatment, dental caries lesion, occlusal surface, and approximal surface. The inclusion criterion was studies including dentists only. Three reviewers independently screened titles and abstracts to determine the eligibility of studies. Subsequently, the full texts of the papers deemed eligible were perused and included in the data extraction process.

RESULTS: The review encompassed 11 studies and the methodological quality was considered moderate. Most dentists would restore lesions confined to enamel and reaching the outer half of the dentin, irrespective of the surface involved. With regard to the occlusal surface, the percentage of dentists who restored enamel lesions ranged from 4.6% to 17.8%. Regarding dentin lesions (outer half), 50.2%-70.2% of the dentists opted for invasive treatment. For the approximal surface, the choice for invasive treatment of enamel lesions ranged from 5%-88%. In dentin lesions, 4.4%-94% of dentists restored lesions in the outer half of the dentin.
CONCLUSION: Despite the progress achieved in the understanding of the development and management of caries, dentists still recommend restorative treatment in its early stages.

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Year of Publication: 2017

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.

Publication Type: Journal Article. Review.
Year of Publication: 2017

Abstract
Current evidence supports noninvasive/nonrestorative treatment of “early” carious lesions: those confined to enamel or reaching the enamel–dentin 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 carrying out restorative 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 did. 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–dentin 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-dentin junction, 48% (95% CI, 40%-56%) of dentists/therapists would intervene restoratively. For proximal 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 countries 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.
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.

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**Title**
Meta-analysis of teeth from European populations before and after the 18th century reveals a shift towards increased prevalence of caries and tooth loss. [Review]

**Source**

**Abstract**
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
Early childhood caries among 5- to 6-year-old children in Southeast Asia.

Source

Abstract
OBJECTIVE: The aim of this study was to examine the prevalence and experience of early childhood caries among 5- to 6-year-old children in Southeast Asia.

METHODS: A literature search was conducted of three electronic databases (PubMed, EMBASE and ISI Web of Science) to identify publications from the years 2006 to 2015. Additional hand searches of government reports and national studies were performed. Both primary and secondary data sources were included in the study. The inclusion criterion was the findings reported on the caries prevalence and/or caries experience in decayed, missing or filled tooth (dmft) or decayed, missing or filled surface (dmfs) scores of 5- to 6-year-old children in Southeast Asian countries. The papers retrieved were assessed by two independent reviewers, and the final decision was made by consensus.

RESULTS: The search identified 320 papers for screening; 293 were excluded and 27 full papers were retrieved and reviewed. Of those, 12 were included. Among the countries, variations were found in caries prevalence and caries experience. The caries prevalence of 5- to 6-year-old children ranged from 25% to 95%, and the caries experience (given as mean dmft score) ranged from 0.9 to 9.0. The median caries prevalence and caries experience (mean dmft score) of children 5-6 years of age were 79% and 5.1, respectively.

CONCLUSION: Based on the included studies, which are limited in quality and quantity, there is evidence that caries prevalence and experience are high amongst preschool children in Southeast Asia.

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.

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

Source

Abstract
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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.