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Search Strategy:
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1 Glycyrrhiza/ (1868)
2 (licorice or liquorice).tw. (1769)
3 "glycyrrhiza glabra".tw. (398)
4 1 or 2 or 3 (2820)
5 limit 4 to dentistry journals (38)
6 exp Tooth Diseases/ (144960)
7 exp Periodontal Diseases/ (71868)
8 (caries or carious or periodont$ or gingiv$ or tooth or teeth or dental or dentist$).tw. (342339)
9 4 and (6 or 7 or 8) (51)
10 5 or 9 (63)
11 limit 10 to english language (59)

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<1>
Unique Identifier 25531232
Status In-Process
Authors Ahn SJ; Park SN; Lee YJ; Cho EJ; Lim YK; Li XM; Choi MH; Seo YW; Kook JK.
Authors Full Name Ahn, Sug-Joon; Park, Soon-Nang; Lee, Young Ju; Cho, Eun-Jung; Lim, Yun Kyong; Li, Xue Min; Choi, Mi-Hwa; Seo, Young-Woo; Kook, Joong-Ki.
Institution Ahn,Sug-Joon. Dental Research Institute, School of Dentistry, Seoul National University, Jongro-Gu, Seoul, Republic of Korea.
Title In vitro antimicrobial activities of 1-methoxyficifolinol, licorisoflavan A, and 6,8-diprenylgenistein against Streptococcus mutans.
Abstract The objective of the study was to investigate the antimicrobial effects of purified single compounds from ethanol-extracted licorice root on Streptococcus mutans. The crude licorice root extract (CLE) was obtained from Glycyrrhiza uralensis, which was subjected to column chromatography to separate compounds. Purified compounds were identified by mass spectrometry and nuclear magnetic resonance. Antimicrobial activities of purified compounds from CLE were evaluated by determining the minimum inhibitory concentration and by performing time-kill kinetics. The inhibitory effects of the compounds on biofilm development were evaluated using crystal violet assay and confocal microscopy. Cell toxicity of substances to normal human gingival fibroblast (NHGF) cells was tested using a methyl thiazolyl tetrazolium (MTT) assay. Chlorhexidine digluconate (CHX) was used in the control group. Three antimicrobial flavonoids, 1-methoxyficifolinol, licorisoflavan A, and 6,8-diprenylgenistein, were isolated from the CLE. We found that the three flavonoids and CHX had bactericidal effects on S. mutans UA159 at the concentration of >4 and >1 micro g/ml, respectively. The purified compounds completely inhibited biofilm development of S. mutans UA159 at concentrations over 4 mug/ml, which was equivalent to 2 mug/ml of CHX. Confocal analysis showed that biofilms were sparsely scattered in the presence of over 4 mug/ml of the purified compounds. However, the three compounds purified from CLE showed less cytotoxic effects on NHGF cells than CHX at these biofilm-inhibitory concentrations. Our results suggest that purified flavonoids from CLE can be useful in developing oral hygiene products, such as gargling solutions and dentifrices for preventing dental caries. Copyright © 2014 S. Karger AG, Basel.
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Year of Publication 2015

<2>
Unique Identifier 25226923
Status In-Process
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Title Stem cells from human exfoliated deciduous teeth differentiate into functional hepatocyte-like cells by herbal medicine.
Abstract Stem cells from human exfoliated deciduous teeth (SHEDs) are mesenchymal stem cells isolated from the exfoliated human deciduous incisor that can differentiate into a many cell types. In this study, we evaluated the effect of licorice or angelica extracts on the hepatic differentiation potential of SHEDs cells. SHEDs cells cultured in medium containing licorice...
extracts were analyzed for 1) changes in cellular morphology, 2) changes in hepatic gene expression, AFP (Alpha-fetoprotein) and ALB (Albumin), and 3) albumin secretion and urea synthesis activity. Our data show that the hepatic differentiation potential of SHEDs cells is enhanced by the presence of liquorice or angelica extracts in the culture medium. Our findings present new therapeutic possibilities for liver damage repair.

**Abstract**

Compared to studies of water extracts of plants, those utilising alkaline extracts are limited. Both water and alkaline extracts from licorice root were compared regarding their biological activities. Licorice root was successively extracted first with water or alkaline solution (pH 9 or 12), and the alkaline (pH 12.0) extract was further separated into 50% ethanol-soluble and -insoluble fractions. Viable cell number was determined by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide method. Antibacterial activity against Porphyromonas gingivalis 381 was determined by turbidity assay. Cytochrome P-450 (CYP)3A4 activity was measured by beta-hydroxylation of testosterone using human recombinant CYP3A4. Radical intensity of superoxide and hydroxyl radicals was determined by electron spin resonance spectroscopy. Alkaline extraction yielded slightly higher amounts of dried materials compared to water extraction. Alkaline extract showed higher anti-HIV and antibacterial activities, and similar magnitudes of CYP3A4 inhibitory and superoxide and hydroxyl radical-scavenging activities, compared to water extract. When alkaline extract was fractionated by 50% ethanol, anti-HIV activity was recovered from the insoluble fraction representing approximately 3% of the alkaline extract, whereas antibacterial activity was concentrated in the soluble fraction rich in glycyrrhizic acid, flavonones and chalcones. All extracts and sub-fractions led to bimodal hormetic dose-response (maximum hormetic response=238%) on the bacterial growth. The present study demonstrated the superiority of alkaline extraction over water extraction for preparing anti-HIV and antibacterial agents at higher yield from licorice root. Copyright © 2014 International Institute of Anticancer Research (Dr. John G. Delinassios), All rights reserved.
BACKGROUND: Dental caries is becoming an ever-growing challenge as the number of elders maintaining their teeth increases. There is a need for low-cost, effective preventive interventions to retain natural teeth for elders.

OBJECTIVE: The purpose of this article is to evaluate evidence based interventions for dentate elders, specifically the adjunct therapies of fluoride, chlorhexidine, xylitol, casein phosphopeptide-amorphous calcium phosphate, ozone, and herbal liquorice.

RESULTS: Fluoride interventions have demonstrated prevention and remineralization of dental caries in elders. Systematic reviews of the literature are unable to establish definitive conclusions regarding the effectiveness of other adjunct therapies in dental caries prevention.

CONCLUSIONS: Further research with elders requires improved study design with well designed multi-center trials. Considerations for new strategies for research of the effectiveness of therapies to reduce dental caries include the development and evaluation of combinations of therapeutic interventions and dental caries management by risk assessment.

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Jain E; Pandey RK; Khanna R. Authors Full Name
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Title
Liquorice root extracts as potent cariostatic agents in pediatric practice.

Source

Abstract
Continuing investigation of fractions from a supercritical fluid extract of Chinese licorice (Glycyrrhiza uralensis) roots has led to the isolation of 12 phenolic compounds, of which seven were described previously from this extract. In addition to these seven metabolites, four known components, 1-methoxerythrabysin II (4), 6,8-diprenylgenistein, gancaonin G (5), and isoglycyrol (6), and one new isoflavan, licorisoflavan C (7), were characterized from this material for the first time. Treatment of licoricidin (1) with palladium chloride afforded larger amounts of 7 and also yielded two new isoflavans, licorisoflavan D (8), which was subsequently detected in the licorice extract, and licorisoflavan E (9). Compounds 1-9 were evaluated for their antibacterial activities against the cariogenic Streptococcus mutans and the periodontopathogenic Porphyromonas gingivalis. Licoricidin (1), licorisoflavan A (2), and 7-9 showed antibacterial activity against P. gingivalis (MICs of 1.56-12.5 μg/mL). The most potent activity against S. mutans was obtained with 7 (MIC of 0.25 μg/mL), followed by 1 and 9 (MIC of 12.5 μg/mL). This study provides further evidence for the therapeutic potential of licorice extracts for the treatment and prevention of oral infections.
To request copies of any of these articles please use one of our request forms. Articles can be emailed or posted for a charge of £2.50 each.

**MATERIALS AND METHODS:** Minimum bactericidal concentrations of aqueous and ethanolic extracts of liquorice against mutans streptococci were evaluated and their toxicity profiles were tested using the model organism Caenorhabditis elegans. The clinical trial was conducted as a double-blind pilot study where pediatric patients (N = 60), aged 7-14 years, were equally divided by randomization into three groups, namely, Group 1 using aqueous liquorice mouthwash (15%), Group 2 using ethanolic liquorice mouthwash (3.75%), and Group 3 using chlorhexidine gluconate (0.156%) as positive control. A baseline pre-rinse and three post-rinse saliva samples were evaluated for the changes in pH and mutans streptococci colony counts. Palatability of liquorice extracts was assessed through a self-designed questionnaire having structured categorical responses.

**STATISTICAL ANALYSIS:** Parametric evaluations were done using Analysis of Variance (ANOVA) and Dunnett’s “t” test.

**RESULTS:** The mean mutans streptococci colony counts in all three groups decreased significantly (P < 0.001) immediately after the oral rinsing. The reduction in colony counts was significant in ethanolic liquorice group as compared to the control (P < 0.01). Liquorice extracts also led to an immediate rise in salivary pH. The results showed an immediate antimicrobial action of liquorice extracts, with limited retentivity.

**CONCLUSION:** The study affirms that both aqueous and ethanolic liquorice extracts are potent cariostatic agents and are found to be palatable by child patients.

**BACKGROUND:** This study compared the effect of adjunctive low dose doxycycline and licorice therapy on gingival crevicular fluid matrix metalloproteinase-8 levels in chronic periodontitis.

**MATERIALS AND METHODS:** In this in vivo, experimental study 39 patients with mild to moderate chronic periodontitis were selected. Samples of GCF were collected from three deepest pockets and MMP-8 concentration was measured. Patients were divided into three groups (n = 13). Groups were treated with doxycycline, licorice and placebo. Sampling and measurement of MMP-8 was repeated after 6 weeks. Data was analyzed by t-paired and ANOVA test. P > 0.001 was considered significant.

**RESULTS:** The decrease in mean of MMP-8 concentration was higher in doxycycline and licorice group in comparison with the placebo group and the difference was statistically significant (P value > 0.001). The decrease in mean of MMP-8 concentration was higher in licorice group than doxycycline group, but the difference was not statistically significant.

**CONCLUSION:** The present study showed that licorice extract can prevent the production of MMPs by host cells and can be as useful as antibiotics like doxycycline to cure periodontal and other inflammatory diseases. It must be added that no side-effects were observed in usage of licorice extract.
BACKGROUND: With the emergence of strains resistant to conventional antibiotics, it is important to carry studies using alternative methods to control these microorganisms causing important infections, such as the use of products of plant origin that has demonstrated effective antimicrobial activity besides biocompatibility. Therefore, this study aimed to evaluate the antimicrobial activity of plant extracts of Equisetum arvense L., Glycyrrhiza glabra L., Punica granatum L. and Stryphnodendron barbatimam Mart. against Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus mutans, Candida albicans, Candida tropicalis, and Candida glabrata, and to analyze the cytotoxicity of these extracts in cultured murine macrophages (RAW 264.7).

METHODS: Antimicrobial activity of plant extracts was evaluated by microdilution method based on Clinical and Laboratory Standards Institute (CLSI), M7-A6 and M27-A2 standards. The cytotoxicity of concentrations that eliminated the microorganisms was evaluated by MTT colorimetric method and by quantification of proinflammatory cytokines (IL-1beta and TNF-alpha) using ELISA.

RESULTS: In determining the minimum microbicidal concentration, E. arvense L., P. granatum L. and S. barbatimam Mart. extracts at a concentration of 50 mg/mL and G. glabra L. extract at a concentration of 100 mg/mL, were effective against all microorganisms tested. Regarding cell viability, values were 48% for E. arvense L., 76% for P. granatum L, 86% for S. barbatimam Mart. and 79% for G. glabra L at the same concentrations. About cytokine production after stimulation with the most effective concentrations of the extracts, there was a significant decrease of TNF-alpha was observed in cultures treated with G. glabra L. (4.92 pg/mL), S. barbatimam Mart. (0.85 pg/mL), E. arvense L. (0.83 pg/mL), and P. granatum L. (0.00 pg/mL) when compared to control (41.96 pg/mL).

CONCLUSIONS: All plant extracts were effective against the microorganisms tested. The G. glabra L extract exhibited least cytotoxicity and the E. arvense L extract was the most cytotoxic.
CONCLUSIONS: Overall, these findings suggest that 18alpha-GA significantly reduces P. gingivalis LPS-induced vascular permeability by repressing NF-kappaB-dependent endothelial IL-6 production, suggesting its therapeutic potential in P. gingivalis-related vascular diseases.

MATERIALS AND METHODS: In the present study, we evaluated the antibacterial activity of Glycyrrhiza glabra (G. glabra) against oral pathogens by diffusion methods and determined the minimum inhibitory concentration (MIC) by both broth and Agar dilution methods and minimum bactericidal concentration (MBC) by broth dilution methods.

RESULTS: In this study, G. glabra extract showed good antibacterial activity against six bacteria. No strain in this study showed resistance against this extract.

CONCLUSION: G. glabra is suggested as an appropriate candidate to help us in order to control dental caries and endodontic infections.

OBJECTIVES: Oral infections and dental caries are still considered as serious public health problems and inflict a costly burden to health care services around the world and especially in developing countries.
baseline measurement. One-hundred and twenty-three subjects (67 men and 56 women, mean age 37) met the criteria at baseline and were entered into either the test or control group by assignment from a table of randomized numbers. The test chewing gum (2.23 g) contained zinc acetate 0.012% and magnolia bark extract 0.15% in weight; the control gum was equivalent without these active agents. The OralChroma device was utilized to evaluate total oral VSC. Their levels were recorded at baseline, after ten minutes of mastication, after one hour, and after two hours. Data were analyzed with SPSS software and the level of significance was set at alpha = 0.05.

RESULTS: One-hundred and twenty-three subjects completed the trial (62 in the control group and 61 in the test group); none reported problems linked to zinc acetate or magnolia bark extract. The mean percentage reductions from baseline at the end of the 10-minute chewing were 31.2% in the control group (p < 0.05) and 50.9% in the test group (p < 0.05). One hour later the reductions were 6.9% in the control group and 27.6% in the test group (p < 0.05); two hours later the reductions were 2.3% in the control group and 13.6% in the test group. The comparison of the two groups after baseline adjustment showed a statistically significant difference (p < 0.05) in VSC reductions between the test and control chewing gums at the end of the mastication period and after one hour.

CONCLUSION: Chewing gum containing zinc acetate and magnoliabark extract can significantly reduce the oral VSC levels for more than one hour. Moreover, the test chewing gum reduces oral VSC significantly more than a control chewing gum.

Source

Abstract
The objective of the study was to investigate the antimicrobial effects of deglycyrrhizinated licorice root extracts (DG-LRE) against Streptococcus mutans UA159 in both the planktonic and biofilm phases by determining the minimum inhibitory concentration and minimum bactericidal concentration, and by performing time-kill kinetic, growth, adhesion, and biofilm assays. The cell toxicity of DG-LRE on normal human gingival fibroblast (NHGF) cells was tested using a methyl thiazolyl tetrazolium assay. This study showed that DG-LRE had strong antimicrobial activity against S. mutans in the planktonic phase with little cytotoxic effect on NHGF cells. In addition, DG-LRE significantly inhibited biofilm formation by S. mutans UA159 at concentrations over 4 mug/ml for glucose or 16 mug/ml for sucrose, respectively, regardless of the presence of saliva-coating. To the best of our knowledge, this is the first report to provide evidence that DG-LRE demonstrates antimicrobial activity against S. mutans. These results suggest that DG-LRE can be used in developing oral hygiene products, such as gargling solution and dentifrice to prevent human dental caries.Copyright © 2012 Elsevier Ltd. All rights reserved.

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Title
Can a licorice lollipop decrease cariogenic bacteria in nursing home residents?.

Source

Abstract
The purpose of this pilot study was to examine whether an herbal lollipop containing licorice root decreases Streptococcus mutans (S. mutans) bacteria that cause dental caries in nursing home residents. A total of 8 residents (5 women, 3 men; mean age = 85) consented to participate in this study. Participants were offered two lollipops per day for 21 days. Saliva samples were collected at baseline and Days 1, 3, 7, 14, and 21, then analyzed for numbers of
of S. mutans. Using linear mixed-models analysis with difference in numbers of S. mutans from baseline to any time point as the dependent variable, and number of lollipops consumed with effect of time controlled as the predictor variable, participants who consumed more lollipops during the 21-day time period were more likely to have fewer numbers of S. mutans (beta = -8.703, p = 0.067). There was a trend toward reduction of S. mutans with consumption of more lollipops during the 21-day period. Recruiting a larger sample for future research may demonstrate a significant reduction. Copyright 2012, SLACK Incorporated.

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Journal Article.

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**Authors**
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**Title**
Licorice extract a sweet way to control decay.

**Comments**
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**Source**

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Comment. Letter.

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**Title**
Cranberry proanthocyanidins act in synergy with licochalcone A to reduce Porphyromonas gingivalis growth and virulence properties, and to suppress cytokine secretion by macrophages.

**Source**

**Abstract**
AIMS: Periodontitis is an inflammatory disease of polymicrobial origin that affects the tooth-supporting tissues. With the spread of antibiotic resistance among pathogenic bacteria, alternative strategies are required to better control infectious diseases such as periodontitis. The aim of our study was to investigate whether two natural compounds, A-type cranberry proanthocyanidins (AC-PACs) and licochalcone A, act in synergy against Porphyromonas gingivalis and the host inflammatory response of a macrophage model.

**METHODS AND RESULTS:** Using a checkerboard microtitre test, AC-PACs and licochalcone A were found to act in synergy to inhibit P. gingivalis growth and biofilm formation. Fluorescein isothiocyanate-labelled P. gingivalis adhesion to oral epithelial cells was also inhibited by a combination of the two natural compounds in a synergistic manner. Fluorometric assays showed that although AC-PACs and licochalcone A reduced both MMP-9 and P. gingivalis collagenase activities, no synergy was obtained with a combination of the compounds. Lastly, AC-PACs and licochalcone A also acted in synergy to reduce the lipopolysaccharide (LPS)-induced secretion of the pro-inflammatory mediators IL-1beta, TNF-alpha, IL-6 and IL-8 in a macrophage model.

**CONCLUSIONS:** A-type cranberry proanthocyanidins and licochalcone A, natural compounds from cranberry and licorice, respectively, act in synergy on both P. gingivalis and the host immune response, the two principal etiological factors of periodontitis.

**SIGNIFICANCE AND IMPACT OF THE STUDY:** The combined use of AC-PACs and licochalcone A may be a potential novel therapeutic strategy for the treatment and prevention of periodontal disease. Copyright © 2012 The Authors Journal of Applied Microbiology © 2012 The Society for Applied Microbiology.

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Authors
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Title
Licorice isoliquiritigenin suppresses RANKL-induced osteoclastogenesis in vitro and prevents inflammatory bone loss in vivo.

Source

Abstract
Osteoclasts, bone-specialized multinucleated cells, are responsible for bone destructive diseases such as osteoporosis, periodontitis, and rheumatoid arthritis. Natural plant-derived products have received substantial attention given their potential therapeutic and preventive activities against human diseases. In the present study, we investigated the effects of isoliquiritigenin (ISL), a natural flavonoid isolated from licorice, on receptor activator of nuclear factor-kappaB ligand (RANKL)-induced in vitro osteoclastogenesis and inflammation-mediated bone destruction in vivo. We observed that ISL dose-dependently inhibited RANKL-induced osteoclast formation from RAW 264.7 and primary mouse bone marrow-derived macrophages (BMMs), as well as decreased the extent of lacunar resorption. Specifically, ISL targeted RANKL-induced osteoclastogenesis and F-actin rings formation at an early stage. The RANKL-stimulated mRNA expression of osteoclast-related genes and transcription factors were also diminished by ISL. Mechanistically, ISL blocked the RANKL-triggered RANK-TRAF6 association, phosphorylation of mitogen-activated protein kinases (MAPKs), inhibitor of kappaBalpha (IkappaBalpha) phosphorylation and degradation, nuclear factor-kappaB (NF-kappaB) p65 nuclear translocation, and activator protein (AP)-1 activation. ISL almost abrogated the nuclear factor of activated T cells (NFATc1) expression and inhibited its nuclear translocation specifically in pre-osteoclasts. Furthermore, the ectopic introduction of NFATc1 into osteoclast precursors almost reversed the ISL-elicted anti-osteoclastogenic effects. Consistent with the in vitro results, administration of ISL prevented inflammatory bone loss in mice by attenuating osteoclast activity. Taken together, our results demonstrated that ISL suppresses RANKL-induced osteoclastogenesis and inflammatory bone loss via RANK-TRAF6, MAPK, IkappaBalpha/NF-kappaB, and AP-1 signaling pathways. Therefore, ISL may be considered as a novel therapeutic and/or preventive strategy against lytic bone diseases.

CONCLUSION: This case illustrates the complex relationship of various electrolytes, which can lead to self perpetuation of the disease, hence demanding more vigilance.

Authors
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Title
Licorice-related rhabdomyolysis: a big price for a sweet tooth.

Source

Abstract
UNLABELLED: A 50-year-old lady on hydrochlorothiazide (HCTZ) presented to the hospital after 4 days of generalized muscle aches and dark urine. She admitted to consuming one and a half bags of black licorice bites containing 2% natural licorice during the past 3 weeks. Examination showed high blood pressure, while labs revealed elevated creatine kinase, hypokalemia, hypocalcemia and hypophosphatemia with low aldosterone and plasma renin levels and high intact PTH. The active component of licorice is glycyrrhizic acid, which inhibits an enzyme required to convert cortisol to a less active metabolite, cortisone. This causes excess cortisol, simulating syndrome of apparent mineralocorticoid excess (AME), thus resulting in hypertension, hypokalemia and metabolic alkalosis. In our patient, licorice induced hypokalemia resulted in rhabdomyolysis. The rhabdomyolysis along with the effect of licorice led to secondary hypocalcaemia, which in turn triggered secondary hyperparathyroidism. This might have had a phosphaturic effect that caused hypophosphatemia, further worsening rhabdomyolysis.

CONCLUSION: This case illustrates the complex relationship of various electrolytes, which can lead to self perpetuation of the disease, hence demanding more vigilance.
Reduction of bacterial volatile sulfur compound production by licoricidin and licorisoflavan A from licorice.

Halitosis affects a large proportion of the population and is, in most cases, caused by the production of volatile sulfur compounds (VSCs), particularly methyl mercaptan and hydrogen sulfide, by specific bacterial species colonizing the oral cavity. In this study, a supercritical extract of Chinese licorice (Glycyrrhiza uralensis), and its major isoflavans, licoricidin and licorisoflavan A, were investigated for their effect on growth, VSC production and protease activity of Porphyromonas gingivalis, Prevotella intermedia and Solobacterium moorei, which have been associated with halitosis. The effects of licorice extract, licoricidin, and licorisoflavan A on VSC production in a saliva model were also tested. We first showed that licoricidin and licorisoflavan A, and to a lesser extent the licorice extract, were effective in inhibiting the growth of all three bacterial species, with minimal inhibitory concentrations in the range of 2-80 micro g ml(-1). The licorice extract and the two isolates licoricidin and licorisoflavan A, were able to dose-dependently reduce VSC production by P. gingivalis, Prev. intermedia, and S. moorei as well as by a human saliva model. Although the extract and isolates did not inhibit the proteolytic activity of bacteria, they blocked the conversion of cysteine into hydrogen sulfide by Prev. intermedia. Lastly, the deodorizing effects of the licorice extract, licoricidin, and licorisoflavan A were demonstrated, as they can neutralize P. gingivalis-derived VSCs. Licorisoflavan A (10 micro g ml(-1)) was found to be the most effective by reducing VSC levels by 50%. Within the limitations of this study, it can be concluded that a licorice supercritical extract and its major isoflavans (licoricidin and licorisoflavan A) represent natural ingredients with a potential for reducing bacterial VSC production and therefore for controlling halitosis.
Liquorice and dentistry

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**Tooth brushing, oil pulling and tissue regeneration: A review of holistic approaches to oral health.**

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**Title**
Tooth brushing, oil pulling and tissue regeneration: A review of holistic approaches to oral health.

**Source**

**Abstract**
Even though dentistry was not a specialized branch of Ayurveda, it is included in its Shalakya Tantra (system of surgery). Problems such as deformities of the oral cavity, plaques and infections were managed in ancient India. Traditional medicine can treat various infectious and chronic conditions. Research has shown that all kinds of chewing sticks described in ancient Ayurveda texts have medicinal and anti-cariogenic properties. Its oil pulling (Kaval, Gandush) practice is claimed to cure about 30 systemic diseases. Amla (Emblic myrobalan), is a general rebuilder of oral health. Bilberry fruit (Vaccinium myrtillus) and hawthorn berry (Crateagus oxycaanthus) stabilize collagen, strengthening the gum tissue. Liquorice root (Glycyrrhiza glabra) promotes anti-cavity action, reduces plaque, and has an antibacterial effect. Use of safe, quality products and practices should be ensured based on available evidence if traditional medicine is to be acknowledged as part of primary health care. Scientific validations of the Ayurveda dental health practices could justify their incorporation into modern dental care. Publicity of these techniques using appropriate media would benefit the general population by giving more confidence in the ancient practices, thus preventing tooth decay and loss.

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**Haemostatic effect of Ankaferd Blood Stopper() seen during adenoidectomy.**

**Authors**
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**Title**
Haemostatic effect of Ankaferd Blood Stopper() seen during adenoidectomy.

**Source**

**Abstract**
In Turkey, Ankaferd Blood Stopper() (ABS) has been approved for the management of external haemorrhages and bleedings occurring during dental surgeries (Goker et al., 2008). Ankaferd comprises a standardized mixture of plants, including Thymus vulgaris, Glycyrrhiza glabra, Vitis vinifera, Alpinia officinarum, and Urtica dioica. This study aimed to evaluate the efficacy of AB S tamponade in the control of intra-operative bleeding occurring during ad enoidectomy performed in children under the age of 12. Sixty children were randomized to receive 1 to 5 minute-tamponade with either ABS or topical gauze sponges soaked in saline solution (SS) during their ad enoidectomy.. Time-to-haemostasis and the number of packs required were recorded. A visual analog scale was used by the operating surgeon to record subjective data, including the rate of bleeding following the first adenoid pack removal (0= none, 3=brisk). Compared to the children in the SS group (n=30), time-to-haemostasis seen in ABS patients (n=30) was significantly shorter (mean +/- standard deviation, 1.93 +/- 1.50 min vs 3.20 +/- 1.50 min; p<0.0001); they required a lower number of packs (mean, 1.93 vs. 3.20), and appeared to bleed less (53.3% vs 6.7%; p=0.0001). ABS aids in the control of intra-operative bleeding and reduces the number of packs required to achieve haemostasis, so that it can be recommended for tamponades per formed during paediatric adenoidectomies.

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**Development and evaluation of a safe and effective sugar-free herbal lollipop that kills cavity-causing bacteria.**


**Authors:**
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**Title:**
Development and evaluation of a safe and effective sugar-free herbal lollipop that kills cavity-causing bacteria.

**Abstract:**
Dental caries (tooth decay) is caused by a specific group of cariogenic bacteria, like Streptococcus mutans, which convert dietary sugars into acids that dissolve the mineral in tooth structure. Killing cariogenic bacteria is an effective way to control or prevent tooth decay. In a previous study, we discovered a novel compound (Glycyrrhizin A), from the extraction of licorice roots, with strong antimicrobial activity against cariogenic bacteria. In the current study, we developed a method to produce these specific herbal extracts in large quantities, and then used these extracts to develop a sugar-free lollipop that effectively kills cariogenic bacteria like Streptococcus mutans. Further studies showed that these sugar-free lollipops are safe and their antimicrobial activity is stable. Two pilot human studies indicate that a brief application of these lollipops (twice a day for ten days) led to a marked reduction of cariogenic bacteria in oral cavity among most human subjects tested. This herbal lollipop could be a novel tool to promote oral health through functional foods.

**Source:** NLM. PMC3469870

**Modulation of matrix metalloproteinase and cytokine production by licorice isolates licoricidin and licorisoflavan A: potential therapeutic approach for periodontitis.**


**Authors:**
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**Institution:**
La, Vu Dang. Faculty of Dentistry, Laval University, Quebec City, QC, Canada.

**Title:**
Modulation of matrix metalloproteinase and cytokine production by licorice isolates licoricidin and licorisoflavan A: potential therapeutic approach for periodontitis.

**Abstract:**
BACKGROUND: Inflammatory cytokines and matrix metalloproteinases (MMPs) produced by resident and inflammatory cells in response to periodontopathogens play a major role in the tissue destruction observed in periodontitis, which is a disease that affects tooth-supporting structures. In the present study, we investigate the effects of licorice-derived licoricidin (LC) and licorisoflavan A (LIA) on the secretion of various cytokines and MMPs by human monocyte-derived macrophages stimulated with Aggregatibacter actinomycetemcomitans (previously Actinobacillus actinomycetemcomitans) lipopolysaccharide (LPS).

METHODS: Macrophages were treated with non-toxic concentrations of LC or LIA before being stimulated with A. actinomycetemcomitans LPS. The secretion of cytokines and MMPs and the activation of nuclear factor-kappa B (NF-κB) p65 and activator protein (AP)-1 were assessed by enzyme-linked immunosorbent assays.

RESULTS: LC and LIA inhibited the secretion of interleukin (IL)-6 and chemokine (C-C motif) ligand 5 in a concentration-dependent manner but did not affect the secretion of IL-8 by LPS-stimulated macrophages. LC and LIA also inhibited the secretion of MMP-7, -8, and -9 by macrophages. The suppression of cytokine and MMP secretion by LC and LIA was associated with the reduced activation of NF-κB p65 but not that of AP-1.

CONCLUSION: The present study suggests that LC and LIA have potential for the development of novel host-modulating strategies for the treatment of cytokine and/or MMP-mediated disorders such as periodontitis.

**Source:** NLM. PMC3469870

**Publication Type:**
Journal Article. Research Support, Non-U.S. Gov't.
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**BDA LIBRARY MEDLINE SEARCH**

**LIQUORICE AND DENTISTRY**

A laboratory evaluation of the antibacterial and cytotoxic effect of Liquorice when used as root canal medicament.

**Abstract**

**AIM:** To evaluate the antibacterial and cytotoxic effects of Liquorice as a root canal medicament and to compare its action to the commonly used root canal medicament calcium hydroxide Ca(OH)\(_2\).

**METHODODOLOGY:** The antibacterial effect of Liquorice and Ca(OH)\(_2\) either separately or in combination was investigated against Enterococcus faecalis. Agar-well diffusion methods, broth microdilution tests and biofilm susceptibility assays were used to determine the antibacterial activity. Human periodontal ligament fibroblast tissue culture was used to assess the cytotoxicity of the preparations under investigation.

**RESULTS:** Liquorice extract either by itself or in combination with Ca(OH)\(_2\) had a significant inhibitory effect against Enterococcus faecalis compared with that of Ca(OH)\(_2\) alone. The use of Liquorice extract followed by Liquorice/Ca(OH)\(_2\) mixture retained significantly more viable periodontal ligament cells than Ca(OH)\(_2\) , which had a strong lethal effect on the cells.

**CONCLUSION:** Liquorice extract either separately or as Liquorice/Ca(OH)\(_2\) mixture had a potent bactericidal effect against Enterococcus faecalis and retained compatibility with fibroblasts in tissue culture compared to the commonly used root canal medicament Ca(OH)\(_2\).
CONCLUSION: A potential for simple effective caries-prevention for high-risk children has been demonstrated. Encouraging results warrant randomised clinical trials (RCT) of liquorice root in herbal lollipops or alternative modes of delivery.

RESULTS: 18beta-Glycyrrhetinic acid administered either prophylactically or therapeutically resulted in a dramatic reduction of infection-induced bone loss in interleukin-10-deficient mice, which are highly disease susceptible. Although GA has been reported to exert its anti-inflammatory activity via downregulation of 11beta-hydroxysteroid dehydrogenase-2 (HSD2), which converts active glucocorticoids to their inactive forms, GA did not reduce HSD2 gene expression in gingival tissue. Rather, in glucocorticoid-free conditions, GA potently inhibited LPS-stimulated proinflammatory cytokine production and RANKL-stimulated osteoclastogenesis, both of which are dependent on nuclear factor-kappaB. Furthermore, GA suppressed LPS- and RANKL-stimulated phosphorylation of nuclear factor-kappaB p105 in vitro.

CONCLUSION: These findings indicate that GA inhibits periodontitis by inactivation of nuclear factor-kappaB in an interleukin-10- and glucocorticoid-independent fashion. Copyright © 2010 John Wiley & Sons A/S.
removing efficacy of chitosan-based polyherbal toothpaste with commercially available chlorhexidine gluconate (0.2% w/v) mouthwash as positive control. Total microbial count was carried out to determine the percentage decrease in the oral bacterial count over the period of treatment.

RESULT: Herbal extracts were found to possess satisfactory antimicrobial activity against most of the dental pathogens. Chitosan-containing polyherbal toothpaste significantly reduces the plaque index by 70.47% and bacterial count by 85.29%, and thus fulfills the majority of esthetic and medicinal requirements of oral hygiene products.

CONCLUSION: Chitosan-based polyherbal toothpaste proves itself as a promising novel oral hygiene product as compared with currently available oral hygiene products. A further study to confirm the exact mechanism and active constituents behind antiplaque and antimicrobial activity of chitosan-based polyherbal toothpaste and its efficacy in large number of patient population is on high demand.

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20101008
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2010

Authors
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Title
Role of the Chinese herbal medicine xianhuayin on the reversal of premalignant mucosal lesions in the golden hamster buccal pouch.
Source
Other ID
Source: NLM. PMC3475595
Abstract
AIM: To investigate the role of the Chinese herbal medicine Xianhuayin in the reversal of 7,12-dimethylbenz[a]anthracene (DMBA)-induced premalignant mucosal lesions in the oral buccal pouch of golden hamsters.

METHODOLOGY: The animals were randomly divided into a non-diseased control group (n=5) and an experimental group including 50 animals in which the buccal mucosa had been painted with DMBA (0.5% in acetone) to generate an oral mucosa premalignant lesion. Animals in the experimental group were further divided into Xianhuayin-treated group (n=30), untreated premalignant lesion group (n=10) and normal saline (NS)-treated group (n=10). The cheek (buccal) pouch mucosa of the golden hamsters in each group was observed with light and electron microscopy eight weeks after intragastric administration with NS or Xianhuayin.

RESULTS: In the non-diseased control group, the buccal mucosa was keratinized and stratified squamous epithelium under a light microscope. In the untreated premalignant lesion group, variable degrees of epithelial dysplasia was observed. The irregular epithelial mucosa gradually became distinct in the Xianhuayin-treated group. Scanning electronic microscopic (SEM) analysis showed that surface of the cells exhibited honeycomb structures in the hamster of untreated-group. The cells were morphologically irregular, overlapped and loosened in the untreated premalignant lesion group. Most of the cell surface exhibited honeycomb structure in the Xianhuayin-treated group. Transmission electronic microscopic (TEM) analysis showed that buccal mucosal epithelial cells were morphologically regular in the non-diseased control group. Desmosomes and tonofibrils were reduced and the nucleus was morphologically irregular in the untreated premalignant lesion group. In the Xianhuayin-treated group, the widening intercellular gap was gradually reduced, desmosomes and the cells becoming morphologically regular. No significant difference was observed between the hamsters in NS-treated group and those in the untreated premalignant lesion group. Significant therapeutic efficacy was observed in the group receiving Xianhuayin.

CONCLUSION: Xianhuayin is effective in the reversal of DMBA-induced premalignant lesions in the buccal pouch of golden hamsters.

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20100809
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2010

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20098971

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**Title**
Use of Ankaferd Blood Stopper as a hemostatic agent: a clinical experience.

**Source**

**Abstract**
AIM: To determine the efficacy of the topical application of Ankaferd Blood Stopper (ABS) on hemorrhagic diathesis following dental procedures under different conditions.

BACKGROUND: Some patients have a tendency to bleed excessively after dental surgery for a variety of reasons, making oral surgical procedures more risky for these patients. Since hemorrhage can cause major morbidity and mortality, the identification of a novel, effective hemostatic agent could improve the management of excessive bleeding that occurs during dental procedures.

CASE DESCRIPTIONS: Four patients (3 females, 1 male) aged 28-45 with bleeding tendencies due to different presurgical conditions such as von Willebrand Disease, chronic liver failure, and mitral valve replacement presented for tooth extraction. Hematological consultations were obtained prior to surgical intervention and their international normalized (INR) ratio values were adjusted to less than 1.5; none received clotting factor replacement. All the extractions were performed under local anesthesia with and without epinephrine. In the presence of postsurgical bleeding, the efficacy of the ampule form of topical ABS was observed. Sex, age, anamnesis, von Willebrand Factor, activated partial thromboplastin time, factor VIII, and platelet counts of patients were recorded prior to the extractions.

CONCLUSIONS: ABS was found to be effective within 10 to 20 minutes in controlling bleeding in most of the patients after dental surgery. These observations suggest the use of ABS may be a beneficial hemostatic agent for use in patients with hemorrhagic diathesis following tooth extraction. Additional research is needed to clarify the role of this unique medicinal product in the surgical treatment of dental patients with bleeding tendency.

CLINICAL SIGNIFICANCE: ABS has demonstrated potential for being an effective hemostatic agent for the treatment of excessive bleeding following dental surgery in four patients with hemorrhagic diathesis.

**Title**
Liquorice health check, Oro-dental implications, and a case report.

**Source**

**Abstract**
Liquorice has an active substance, Glycyrrhizin which inhibits the conversion of precursor cortisol to cortisone by inhibiting the enzyme 11-betahydroxysteroid dehydrogenase. When imbibed, liquorice acts like hyperaldosteronism which presents with typical symptoms including high blood pressure, low blood potassium, and muscle pain and weakness. This article appraises physiological and pharmacological effects on health of liquorice, critiques products containing liquorice, describes a typical case report of liquorice-induced hypertension, and appraises oral effects from consumption of liquorice products.
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Abstract
AIM: To determine the erosive potential of several commercially available lollipops and the protective effect of saliva.

METHODS: The erosive potential of lollipops was determined in vitro by measuring the pH and neutralisable acidity. Subsequently, 10 healthy volunteers tested different types of lollipops. Whole saliva was collected 5 minutes before, 15 minutes during and 10 minutes after consumption. Salivary flow rate and pH were determined.

RESULTS: Fruit flavoured and cola flavoured lollipops have a very low pH (2.3 - 2.4). Yogurt-containing and salmiak (salty liquorice) flavoured lollipops have much higher pH values (3.8-4.7). The neutralisable acidity of 1g of lollipop showed a large variation from < 200 microl to > 1700 microl 0.1 M NaOH. In vivo, lollipops induced 2.5 to 4.7-fold increase in salivary flow rate with a concomitant drop in salivary pH. For fruit flavoured and cola flavoured lollipops the salivary pH dropped below pH 5.5. For strawberry yogurt and salmiak lollipops, the salivary pH remained above this critical value. The volunteers did not report significant differences in preferences for the lollipops.

CONCLUSIONS: Lollipops differ considerable in erosive potential, with fruit flavoured and cola flavoured lollipops having the highest risk for inducing dental erosion. This information is of use for clinicians counselling juvenile patients with dental erosion.

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2009

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19812810
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Title
A sweet tooth as the root cause of cardiac arrest.

Abstract
A 71-year-old woman was admitted with hypotension and bradycardia. An electrocardiogram showed flattened T waves and increased U wave prominence, resulting in a long QT(U) syndrome. Her initial serum potassium level was 1.6 mmol/L (all other electrolytes, including magnesium, were normal). She suffered recurrent ventricular tachycardia and ventricular fibrillation arrest requiring direct current cardioversion and high-dose intravenous potassium chloride replacement. Systematic enquiry revealed that she had been constipated for a number of months and had resorted to consuming large quantities of liquorice for its laxative effects. Endocrinology review identified no primary abnormality of the renin-angiotensin-aldosterone axis, and the patient was diagnosed with hypokalemia secondary to liquorice overindulgence. Liquorice has a mineralocorticoid effect. If chronically consumed in large quantities, this effect may lead to severe depletion of whole-body potassium stores. The present case highlights a rare but important cause of hypokalemic cardiac arrest of which all acute care physicians should be aware.

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Case Reports. Journal Article.
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Year of Publication
2009

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19607905
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**LIQUORICE AND DENTISTRY**

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**Status**
MEDLINE

**Authors**
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**Title**
Aqueous extracts and polysaccharides from liquorice roots (Glycyrrhiza glabra L.) inhibit adhesion of Helicobacter pylori to human gastric mucosa.

**Source**

**Abstract**
AIMS: Aqueous extracts from the roots of Glycyrrhiza glabra L. (Fabaceae) are widely used for treatment of stomach ulcer. The clinical proven effects are related to the presence of anti-inflammatory 12-keto-triterpensaponins in the extracts. Apart from that the influence of Glycyrrhiza glabra extract on the bacterial adhesion of Helicobacter pylori to stomach tissue was to be investigated. Additionally the influence of Glycyrrhiza glabra secondary compounds on the bacterial adhesion of Porphyromonas gingivalis, a major pathogen for induction of periodontal inflammations was to be investigated.

METHODOLOGY: In vitro cytotoxicity against Helicobacter pylori was investigated by agar diffusion assay; antiadhesive properties of aqueous extract, raw polysaccharides and purified polysaccharide fractions was investigated by means of an in situ adhesion assay with FITC-labelled bacteria on tissue slides of human stomach resectates.

RESULTS: Aqueous extract (1mg/mL) of Glycyrrhiza glabra significantly inhibited the adhesion of Helicobacter pylori to human stomach tissue. This effect was related to the polysaccharides isolated from the extract, with one purified acidic fraction (0.25 SPB) as main active polymer. Purified polysaccharides did not exhibit direct cytotoxic effects against Helicobacter pylori and did not influence hemagglutination. Additionally raw polysaccharides from Glycyrrhiza glabra were shown to have strong antiadhesive effects against Porphyromonas gingivalis.

CONCLUSION: Aqueous extracts and polysaccharides from the roots of Glycyrrhiza glabra are strong antiadhesive systems, which may be used as potent tools for a further development of cytoprotective preparations with anti-infectious potential.

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Journal Article.

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MEDLINE

**Authors**
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**Title**
The efficacy of Ankaferd Blood Stopper in antithrombotic drug-induced primary and secondary hemostatic abnormalities of a rat-bleeding model.

**Source**

**Abstract**
Ankaferd comprises a standardized mixture of plants Thymus vulgaris, Glycyrrhiza glabra, Vitis vinifera, Alpinia officinarum and Urtica dioica. Ankaferd Blood Stopper (ABS) as a medicinal product has been approved in the management of external hemorrhage and dental surgery bleedings in Turkey. This study aimed to evaluate the in-vivo hemostatic effect of ABS in rats pretreated with acetylsalicylic acid or enoxaparin. Wistar rats (210-270 g) of both sexes were used in this study. The animals were pretreated with acetylsalicylic acid (10 mg/kg) orally for 4 days or enoxaparin sodium (8 mg/kg) subcutaneously for 3 days or did not receive any anticoagulant before tail cut at 4th day. ABS was administered topically [a total of 4 ml (1 ml/puff x 4)] to the cut tail in the studied animals. The duration of bleeding and the amount of bleeding were measured in order to evaluate the hemostatic effect of ABS. In acetylsalicylic acid-treated animals, topical ABS reduced both the duration and also the amount of bleeding volume by 68.4 and 54.6%, respectively. It was also effective in shortening the duration of bleeding (30.8%) and decreasing the amount of bleeding (32.8%) in enoxaparin-treated animals. ABS, a traditional folkloric medicinal plant extract, has in-vivo hemostatic actions, which may provide a therapeutic potential for the management of patients with deficient hemostasis in the clinical medicine.

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Journal Article.

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<36>
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Title
Aplasia cutis congenita: management of a large skull defect with acrania. Title
Source
Abstract
Aplasia cutis congenita is a rare disorder characterized by absence of skin. Lesions typically occur on the vertex and are sometimes small, but they can affect deep tissues such as the skull bone and dura. Mortality is related to the depth and size of the lesion and can amount to a rate of more than 50% when full thickness is involved. The treatment remains controversial -- both surgical and conservative managements are described. Minor lesions can be controlled with nonsurgical treatment, but large defects require early surgery. We report the case of a female newborn with acrania and scalp aplasia cutis congenita, which was treated with a bipedicle scalp flap based on the temporal vessels. Full- and partial-thickness skin grafts were used to cover the donor site on the temporo-occipital region. Postoperatively, the patient developed a liquorice cyst, which was treated with a shunt, and she has been followed up for evaluation of the bony defect closure and skull morphology. Her neuropsychomotor development is normal. Publication Type
Case Reports. Journal Article. Publication Type

Bodet C; La VD; Gafner S; Bergeron C; Grenier D. Authors Full Name
Bodet, Charles; La, Vu Dang; Gafner, Stefan; Bergeron, Chantal; Grenier, Daniel. Authors
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Title
A licorice extract reduces lipopolysaccharide-induced proinflammatory cytokine secretion by macrophages and whole blood. Title
Source
Abstract
BACKGROUND: Periodontal diseases are a group of inflammatory disorders initiated by specific Gram-negative periodontopathogenic bacteria that lead to the destruction of tooth-supporting tissues. In this study, we tested whether a carbon dioxide-supercritical extract of Glycyrrhiza uralensis (licorice) can reduce the periodontopathogen-induced inflammatory response.
METHODS: Monocyte-derived macrophages were treated with various concentrations of the licorice extract prior to being stimulated with Aggregatibacter actinomycetemcomitans (previously Actinobacillus actinomycetemcomitans) and Porphyromonas gingivalis lipopolysaccharide (LPS). The capacity of the licorice extract to mediate the inflammatory response was also tested in an ex vivo whole blood model stimulated with P. gingivalis LPS. The secretion of interleukin (IL)-1beta, -6, and -8 and tumor necrosis factor-alpha (TNF-alpha) in both models was assessed by enzyme-linked immunosorbent assays. Changes in the phosphorylation state of macrophage intracellular kinases induced by A. actinomycetemcomitans LPS and the licorice extract in the macrophage model were characterized by immunoblotting.
RESULTS: The licorice extract exhibited potent anti-inflammatory properties, inhibiting the periodontopathogen LPS-induced IL-1beta, -6, and -8 and TNF-alpha responses of macrophages. The licorice extract inhibited the phosphorylation of important macrophage
intracellular signaling proteins, including nuclear factor-kappa B p65 nuclear transcription factor and Jun proto-oncogene-encoded activator protein (AP) 1 transcription factor, which are involved in inflammatory signaling pathways. The licorice extract was also a potent inhibitor of the proinflammatory cytokine response in the ex vivo human whole blood model.

CONCLUSION: This CO(2)-supercritical licorice extract is a potential candidate for the development of a new therapy to prevent and/or treat periodontitis-associated tissue destruction.

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Journal Article. Research Support, Non-U.S. Gov't.
Date Created
20080905
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2008

Unique Identifier
18481619
Status
MEDLINE
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Title
Licorice root lollipop shows sweet promise in reducing tooth decay.
Source

Abstract
Recurrent aphthous ulcers (RAU) are a common and painful condition. This article describes a randomized, double-blind clinical trial of an over-the-counter medicated intraoral adhesive patch for treatment of RAU. Subjects were randomly assigned to either an active drug (patch with extract of glycyrrhiza root) or placebo patch treatment group (both n=23) at onset of a lesion. Lesion size and pain report (unstimulated and stimulated) were assessed at intervals. A no-treatment group (n=23) also was recruited and assessed similarly. By the eighth day, the ulcer size for the active treatment group was significantly lower (p < 0.05), while the By the fourth day, the active treatment group lesions in the no-treatment group increased 13% from baseline, reported significantly less pre-stimulus pain (p < 0.01); at this point, 81% of this group reported no pre-stimulus pain, compared with 63% of the placebo patch group and 40% of the no-treatment group.

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2008

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18335124
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Title
Review of over-the-counter treatments for aphthous ulceration and results from use of a dissolving oral patch containing glycyrrhiza complex herbal extract. [Review] [44 refs]
Source

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Abstract
AIM: The aim of this article is to present a review of over-the-counter (OTC) treatment strategies used for aphthous ulcerations and to provide results from the use of an herbal extract containing glycyrrhiza.

BACKGROUND: Aphthous ulceration, a disease of the intra-oral mucosa, is a common condition of unknown etiology that is often self-managed by OTC (no prescription required) medication.

REVIEW: Preparations currently on the market can be divided into several categories: local anesthetic agents, oxygenating agents, mouth rinses, and barriers - further subdivided into paste coverings such as gels or dissolvable or non-dissolvable adhesive patches containing plant extract or synthetic drugs. Other strategies include herbs, hematinic replacement, or off-label OTC drug applications. While many OTC treatments are available and accepted for use with aphthous ulceration, a review of the literature via a number of published research search engines suggests that to date there are no randomized controlled studies to demonstrate OTC preparations do more than manage symptoms. Exceptions include OTC cyanoacrylate products and CankerMelts GX patches which include glycyrrhiza (licorice) extract. The use of CankerMelts has been shown to alter the course of the condition by reducing lesion duration, size, and pain.

SUMMARY: The results of the studies reviewed here suggest CankerMelts GX discs may be as effective as amlexanox (which must be prescribed) in reducing pain and speeding healing. In addition it can be applied by the patient without the adverse events associated with cyanoacrylate formulations. [References: 44]
The aim of this study was to find out whether liquorice-containing starch gel could affect plaque accumulation and its microbial composition. Sixteen healthy volunteers (mean age: 30.4±6.9 years) used 6 g of either control [8% acid-hydrolyzed corn starch, 25% maltitol syrup, water (w/w)] or liquorice gel (control + 2.5% liquorice extract), three times a day for 2 weeks. The gels were used in a random order with a 2-week washout period in between. At the end of each fortnight, plaque was allowed to accumulate for 2 days and all available plaque from the right side of the mouth was collected, weighed, and transferred to transport medium. The plaque on the left side was dyed and photographed in a standardized manner. Mutans streptococci, total streptococci, and facultative bacteria were assessed from the plaque using plate culturing. Plaque index (0-5) of incisors and canines on the left side was evaluated from the photographs. The clinical study was preceded by an in vivo acid production test. The acid production from gels containing 2.5-10% liquorice extract was monitored with a microelectrode. The in vivo acid production potential of the maltitol-containing starch gel was about 50% compared to the sucrose control. Liquorice inhibited acid production from the gel. In the clinical study, the weight of plaque after consumption of the liquorice gel did not differ from that of the control gel. No differences were found in the microbial counts nor in the plaque index between the two gels. In addition, the liquorice gel had no effect on the stability of the predominant bacterial populations of the plaque samples of 16 individuals as detected by PCR-denaturing gradient gel electrophoresis. In conclusion, an addition of liquorice extract to starch-containing gel with a low acid production potential had no effect on the plaque formed during a 2-week gel consumption period.
conjunction with factors related to regulation restrictions suggest that the use of these products may be associated with various adverse reactions that can affect oral health and treatment. Dental hygienists should inform themselves about herbal supplements in order to offer appropriate oral health care to individuals who take these substances. [References: 53]

Abstract

Chewing gums may be suitable vehicles for the delivery of xylitol (X) and chlorhexidine acetate (CHX), both of which can aid oral health. The aim of this study was to determine the clinical effectiveness of chewing gums containing X or a combination of X and CHX in a double-blind, randomised, cross-over, 5-day clinical trial, with a 9-day washout period in a group of participants over 40 years old. After professional tooth cleaning, 8 subjects (mean age 51.3 +/- 10.4 years) used in a random order 2 pieces of ACHX (a liquorice flavoured CHX/X) gum, 2 pieces of BCHX (a chocolate mint flavoured CHX/X), 2 pieces of X (a liquorice flavoured X gum) and 1 piece of ACHX. Gums were chewed 2x daily for 15 min and volunteers refrained from all other oral hygiene procedures. Data were analysed using Friedman nonparametric analysis of variance. Plaque indices for chewing 2 pieces of ACHX gum (0.78 +/- 0.15) and BCHX gum (0.52 +/- 0.15) were significantly lower (p<0.0006) than for X gum (1.57 +/- 0.08). The gingival index was significantly greater (p<0.05) for X containing gum than for the other chewing regimes. The subjects' attitudes to the gums were also assessed by structured questionnaires which showed that all gums were easy to chew, did not adhere to dentures, teeth or restorations and that the subjects preferred to chew 2 pellets rather than 1.

Publication Type

Clinical Trial.  Journal Article.  Randomized Controlled Trial.  Research Support, Non-U.S. Gov't.

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Year of Publication

2003

Unique Identifier

10382579

Status

MEDLINE

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Title

The effect of xylitol and chlorhexidine acetate/xylitol chewing gums on plaque accumulation and gingival inflammation.

Source


Abstract

Chewing gums may be suitable vehicles for the delivery of xylitol (X) and chlorhexidine acetate (CHX), both of which can aid oral health. The aim of this study was to determine the clinical effectiveness of chewing gums containing X or a combination of X and CHX in a double-blind, randomised, cross-over, 5-day clinical trial, with a 9-day washout period in a group of participants over 40 years old. After professional tooth cleaning, 8 subjects (mean age 51.3 +/- 10.4 years) used in a random order 2 pieces of ACHX (a liquorice flavoured CHX/X) gum, 2 pieces of BCHX (a chocolate mint flavoured CHX/X), 2 pieces of X (a liquorice flavoured X gum) and 1 piece of ACHX. Gums were chewed 2x daily for 15 min and volunteers refrained from all other oral hygiene procedures. Data were analysed using Friedman nonparametric analysis of variance. Plaque indices for chewing 2 pieces of ACHX gum (0.78 +/- 0.15) and BCHX gum (0.52 +/- 0.15) were significantly lower (p<0.0006) than for X gum (1.57 +/- 0.08). The gingival index was significantly greater (p<0.05) for X containing gum than for the other chewing regimes. The subjects' attitudes to the gums were also assessed by structured questionnaires which showed that all gums were easy to chew, did not adhere to dentures, teeth or restorations and that the subjects preferred to chew 2 pellets rather than 1.

Publication Type

Clinical Trial.  Journal Article.  Randomized Controlled Trial.  Research Support, Non-U.S. Gov't.

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Title

Electromyographic heterogeneity in the human temporalis and masseter muscles during static biting, open/close excursions, and chewing.

Source


Abstract

The human temporalis and masseter muscles are not activated homogeneously during static bite force tasks. In this study, we studied the possible existence of regional differences in these muscles under dynamic conditions. Electromyographic (EMG) activity was recorded by means of bipolar fine-wire electrodes. Six electrodes were inserted into the temporalis muscle and three into the masseter muscle. Recordings were made during maximal effort intercuspal and incisal static clenches, open/close excursions from both the intercuspal and incisal positions, and unilateral gum and licorice chewing on right and left sides. The EMG peak amplitudes and the peak occurrences were compared. During the static clenches and the open/close excursions, no differences could be demonstrated between the regions of the temporalis muscle. However, during the chewing tasks, the anterior and posterior regions behaved differently. Throughout almost all tasks, both superficial and deep parts could be distinguished in the masseter muscle. A further division of the deep masseter was task-dependent. In both the temporalis and masseter muscles, maximal activity (100%) was reached during intercuspal clenches. The average activity declined to 35% of the maximal activity in the temporalis muscle, to 47% in the deep, and to 86% in the superficial masseter during incisal clenches. During all chewing tasks, the EMG peak activity of the anterior
temporalis and the superficial masseter muscles was higher in the working than in the balancing condition. The general finding was that different regions were preferentially activated, according to task. The detailed regional specialization previously observed during static bite force tasks could not be demonstrated in the present study.

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Journal Article.

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Authors
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Institution
Goultschin,J. Department of Periodontology, Faculty of Dental Medicine, Jerusalem, Israel.

Title

Source

Abstract
Glycyrrhizin, the main saponin of licorice, a surfactant producing aqueous gel, was tested for its effect on gingival health, as a supplemental agent in a toothpaste. 40 male and female volunteers brushed their teeth twice daily, with a toothpaste containing 0.25% and 0.50% glycyrrhizin, or a control toothpaste, respectively. All 3 toothpastes contained sodium lauryl sulfate as detergent. The subjects of the 3 groups were examined at days 0, 7, 14, 28, 35 and 42 for plaque, gingival and bleeding indices. The examiner was unaware of subject assignment. None of the brushing regimens with the experimental toothpastes induced significant changes in the examined indices, that were distinct from those observed with the control toothpaste. The decrease (insignificant) in the indices of the study period from 0 to 14 days may be considered as an increased oral hygiene awareness by the subjects examined. Possible explanations for the lack of efficiency in improvement of plaque, gingival and bleeding indices, may have been an insufficient glycyrrhizin concentration and/or chemical incompatibility in a toothpaste containing a mixture of an anionic detergent and an organic antibacterial surface agent.

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Clinical Trial.  Controlled Clinical Trial.  Journal Article.  Research Support, Non-U.S. Gov't.

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Status
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Title
Caries and consumption of sweets in 15- and 18-year-olds interviewed with visualization.

Source

Abstract
The aim of this study was first to investigate the relationship at group level between approximal caries, restorations in posterior regions and consumption of sweets during the past 3 yr in 15-yr-old schoolchildren selected for different caries experience. An interview method was used with the sweets on display. Secondly, the aim was to reinterview the subjects as 18-yr-olds using the same method in order to study the correlation between caries incidence and consumption of sweets during the past 3 yr. Seventy-five individuals from three groups, 30 with 0, 25 with 4-6, and 20 with 12-15 approximal DFS, were selected for the first interview. Sixty-nine of them were reinterviewed 3 yr later. Caries incidence during the 3-yr period was expressed as a percentage of the number of caries-free approximal surfaces of premolars and molars at the age of 15. The results showed no statistically significant differences in mean number of intakes of sweets per day (2.2, 2.2, and 2.8) between the original DFS groups. The correlation coefficient between caries incidence and number of intakes of sweets in the second part of the study was 0.25 (P less than 0.05). After correction for the modifying effect of oral hygiene, the coefficient was 0.51 (P less than 0.01) in the less favorable fraction and 0.11 (P greater than 0.05) in the favorable fraction.

Publication Type
Journal Article.  Research Support, Non-U.S. Gov't.

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1990
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**<51>**
Unique Identifier: 2490930
Status: MEDLINE

**Authors**
Steinberg D; Sgan-Cohen HD; Stabholz A; Pizanty S; Segal R; Sela MN.

**Institution**
Steinberg, D. Hebrew University, Jerusalem, Israel.

**Title**
The anticariogenic activity of glycyrrhizin: preliminary clinical trials.

**Source**

**Abstract**
A clinical trial to test the compound glycyrrhizin, the sweet component of licorice, was conducted on 21 dental students. A split-mouth technique of glycyrrhizin application was used. Subjects were instructed to discontinue all oral hygiene procedures, but no dietary modifications were imposed. After 3 days a highly significant reduction in plaque was detected in the upper central incisors on the experimental sides compared with the control sides of students' mouths. Comparing all teeth, less plaque was found on experimental sides than on control sides of the mouths. This difference demonstrated a tendency towards statistical significance. After 4 days the quantitative differences between the two halves of the mouths (less plaque on experimental sides) were greater than after 3 days. This pilot study might indicate the potential of glycyrrhizin in controlling dental plaque.

**Publication Type**
Clinical Trial. Controlled Clinical Trial. Journal Article. Research Support, Non-U.S. Gov't.

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**<52>**
Unique Identifier: 3164025

**Authors**
Weeks SM.

**Title**
Licorice and tobacco.

**Source**

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**<53>**
Unique Identifier: 3162487

**Authors**
Solomon C.

**Title**
Lamenting licorice.

**Source**

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**<54>**
Unique Identifier: 3961310

**Authors**
Petersen PE.

**Title**
Dental health behaviour among 25-44-year-old Danes.

**Source**
Abstract
The purpose of the present investigation was to describe dental health behaviour in an adult Danish population and to study whether oral hygiene habits and consumption of sweets were affected by living conditions. The study group comprised 749 persons in the age group 25-44 years (82% of the original sample) and data on general health behaviour and dental health behaviour were collected by interviews. Regular dental visits were reported by 86%, 83% declared that they brush their teeth at least twice a day and toothbrushing after breakfast was reported by 51%. Regular use of toothpicks was reported by 45%, while dental floss was used by 22%. Dental visits varied according to education, income, work in shifts, sex, and self-assessment of dental health, while toothbrushing habits were affected by urbanization, sex, education, number of children in family, and self-assessment of dental health. Daily consumption of cakes/pastry was reported by 10%, six percent consumed chocolate/liquorice every day, while soft drinks were drunk every day by 10%. Consumption of sweets varied according to education, shift work, sex, strained life situations, and the number of children in family. Among the regular dental visitors, oral hygiene habits were also influenced by living conditions. Thus, the challenges to general dental practice as regards dental health education are great.

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Journal Article.

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19860515

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3981425

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Authors
Segal R; Pisanyt S; Wormser R; Azaz E; Sela MN.

Title
Anticariogenic activity of licorice and glycyrrhizin I: Inhibition of in vitro plaque formation by Streptococcus mutans.

Source

Abstract
The effect of licorice and its active sweet component glycyrrhin was tested on the growth and adherence to glass of the cariogenic Streptococcus mutans. Neither licorice nor glycyrrhizin promoted growth or induced plaque formation. In the presence of sucrose, glycyrrhizin did not affect bacterial growth, but the adherence (plaque formation) was markedly inhibited. At 0.5-1% glycyrrhizin, inhibition was almost complete. These results support our previous suggestions that glycyrrhizin might serve as an efficient vehicle for topical oral medications.
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**<57>**
Unique Identifier
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Authors
Edgar WM.
Title
Reduction in enamel dissolution by liquorice and glycyrrhizinic acid.
Source

**<58>**
Unique Identifier
271526
Status
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Authors
Toors FA; Herczog JI.
Title
Acid production from a nonsugar licorice and different sugar substitutes in Streptococcus mutans monoculture and pooled plaque-saliva mixtures.
Source

**<59>**
Unique Identifier
13654595
Status
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Authors
HARRIS SC; WORLEY RC.
Title
The relative local anesthetic potencies of procaine, oracaine, kincaine, and xylocaine.
Source