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With kind regards

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CONTENTS: BOOKS AND ARTICLES

BOOKS:

Haapasalo Markus, Kotiranta Anja
Käytännön juurihoido................................................................. 16

Hessari Hossein
Oral health among young adults and the middle-aged in Iran..................... 16

Kervanto-Seppälä Sari
Arrestin occlusal enamel caries lesions with pit and fissure sealants............. 17

Kuula Heidi
Periodontitis and peri-implantitis biomarkers in human oral fluids and the null-allele mouse model...................................................... 18

Lukinmaa Pirjo-Liisa
Suupatologian mikroskooppi kurssi............................................. 19

Palotie Ulla
Restorative treatment practices and dentist-related factors. ......................... 20

Suojanen Juho
Studies on Matrix Metalloproteinase (MMP-2, -9, and -14) and β2 Integrin Targeting as Potential Anticancer Therapeutics ................................. 21

Tuomainen Anita
Inflammation-induced atherogenesis, liver alterations, and cardiovascular outcome. .................................................................................. 22
Vyšniauskaite Sonata
Oral health behaviour, conditions and care among dentate elderly patients in Lithuania………………………………………………………………………………………………………………23

Yazdani Reza
Dental health and school-based health education among 15-year-olds in Tehran, Iran…………………………………………………………………………………………………………………………24

ARTICLES IN ENGLISH

Ahlberg Jari
Smoking and orofacial pain-do we need to add bruxism, psychology, or sleep……..26

Oral lichen planus and chronic junctional stomatitis: differences in lymphocyte subpopulations…………………………………………………………………………………………………..26

Alaluusua Satu, Alapulli Heikki
Dentinogenesis Imperfecta type II. ……………………………………………………………26

Bäck Leif, Liukko Tommi, Rantanen Irma, Peltola Jaakko, Partinen Markku, Ylikoski Jukka, Mäkitie Antti
Hypertonic saline injections to enhance the radiofrequency thermal ablation effect in the treatment of base of tongue in obstructive sleep apnea patients: a pilot study….27

Bäck Leif, Liukko Tommi, Rantanen Irma, Peltola Jaakko, Partinen Markku, Ylikoski Jukka, Mäkitie Antti
Radiofrequency surgery of the soft palate in the treatment of mild obstructive sleep apnea is not effective as a single-stage procedure……………………………………………..27

Bascones-Martínez Antonio, Muñoz-Corcuera Marta, Meurman Jukka H.
Odontogenic infections in the etiology of infective endocarditis. ……………………28
Beklen A, Sorsa Timo, Konttinen Yrjö T.
Toll-like receptors 2 and 5 in human gingival epithelial cells co-operate with T-cell cytokine interleukin-17.......................................................... 29

Bernabé E, Suominen-Taipale A. L, Vehkalahti Miira, Nordblad A, Sheiham A.
The T-Health index: a composite indicator of dental health.............................. 29

Biyikoglu B, Buduneli N, Kardeşler L, Aksu K, Pitkälä M, Sorsa Timo
Gingival crevicular fluid MMP-8 and -13 and TIMP-1 levels in patients with rheumatoid arthritis and inflammatory periodontal disease. ......................... 30

Buhlin Kåre, Hultin Margareta
Periodontal treatment influences risk markers for atherosclerosis in patients with severe periodontitis. ................................................................. 31

Cazalis Julia, Tanabe Shin-ichi, Gagnon Guy, Sorsa Timo, Grenier Daniel
Tetracyclines and chemically modified tetracycline-3 (CMT-3) modulate cytokine secretion by lipopolysaccharide-stimulated whole blood............................ 31

Charoenchaikorn Kesinee, Yokomizo Tomomasa, Rice David, Honjo Tadashi, Matsuzaki Kiyomi, Shintaku Yuku, Imai Yuichi, Wakamatsu Asami, Takahashi Satoru, Ito Yoshiaki, Takano-Yamamoto Teruko, Thesleff Irma, Yamamoto Masayuki, Yamashiro Takashi
Runx1 is involved in the fusion of the primary and the secondary palatal shelves... 32

Cinar Ayse Basak, Murtomaa Heikki
A holistic food labelling strategy for preventing obesity and dental caries............. 33

Cinar Ayse Basak, Tseveenjav BattsetseG, Murtomaa Heikki
Oral health-related self-efficacy beliefs and toothbrushing: Finnish and Turkish pre-adolescents’ and their mothers’ responses........................................... 33

Ghasemi Hadi, Murtomaa Heikki, Torabzadeh Hassan, Vehkalahti Miira
Perceived barriers to the provision of preventive care among Iranian dentists. ...... 34
Gürsoy Mervi, Haraldsson G, Hyvönen M, Sorsa Timo, Pajukanta R, Könönen Eija
Do the frequency of Prevotella intermedia increase during pregnancy..............35

Gürsoy Ulvi Kahraman, Gürsoy Mervi, Gürsoy Orhan Vedat, Cakmakci Lutfu, Könönen Eija, Uitto Veli-Jukka
Anti-biofilm properties of Satureja hortensis L. essential oil against periodontal pathogens..................................................................................................................35

Gürsoy Ulvi Kahraman, Könönen Eija, Uitto Veli-Jukka
Prevotella intermedia ATCC 25611 targets host cell lamellipodia in epithelial cell adhesion and invasion. .................................................................36

Gursoy Ulvi Kahraman, Könönen Eija, Uitto Veli-Jukka, Pussinen Pirkko, Hyvärinen Kati, Suominen-Taipale Liisa, Knuuttila Matti
Salivary interleukin-1beta concentration and the presence of multiple pathogens in periodontitis..........................................................................................37

Hajihosseini Mohammad K, Duarte Raquel, Pegrum Jean, Donjacour Anne, Lana-Elola Eva, Rice David, Sharpe James, Dickson Clive
Evidence that Fgf10 contributes to the skeletal and visceral defects of an Apert syndrome mouse model.................................................................37

Heikkinen Anna Maria, Broms Ulla, Pitkäniemi Janne, Koskenvuo Markku, Meurman Jukka H.
Key factors in smoking cessation intervention among 15-16-year-olds. ..............38

Heimonen Aura, Janket Sok-Ja, Kaaja Risto, Ackerson Leland K, Muthukrishnan Preetika, Meurman Jukka H.
Oral Inflammatory burden and preterm birth. ......................................................38

Heliövaara Arja, Nyström Marjatta
Dental age in 6-year-old children with submucous cleft palate and cleft of the soft palate.................................................................39
Proteolytic roles of matrix metalloproteinase (MMP)-13 during progression of chronic periodontitis: initial evidence for MMP-13/MMP-9 activation cascade....40

Hessari Hossein, Vehkalahti Miira, Eghbal Mohammad J
Lifelong exposure to smoking and oral health among 35- to 44-year-old Iranians. .40

Höglund-Åberg Carola
Presence of Aggregatibacter actinomycetemcomitans in young individuals: a 16-year clinical and microbiological follow-up study.................................................41

Holbrook W. P, Furuholm J, Gudmundsson K, Theodórs A, Meurman Jukka H.
Gastric reflux is a significant causative factor of tooth erosion..............................42

Husebye E. S, Perheentupa Jaakko, Rautemaa Riina, Kämpe O.
Clinical manifestations and management of patients with autoimmune polyendocrine syndrome type 1..........................................................42

Chlamydial and periodontal pathogens induce hepatic inflammation and fatty acid imbalance in apolipoprotein E-deficient mice. .................................................43

Hyvärinen Kati, Laitinen Saara, Paju Susanna, Hakala Anne, Suominen-Taipale Liisa, Skurnik Mikael, Köönen Eija, Pussinen Pirkko
Detection and quantification of five major periodontal pathogens by single copy gene-based real-time PCR..........................................................43

Juusela Pirjo, Tanskanen Maarit, Nieminen Anja, Uitto Veli-Jukka, Blåfield Harri, Kiuru-Enari Sari
Hereditary gelsolin amyloidosis mimicking Sjögren's syndrome.........................44
Kari Osmo, Määttä Marko, Tervahartiala Taina, Peltonen Sirje, Kari Marjatta, Hagström Jaana, Sorsa Timo, Saari Matti, Haahtela Tari
Tear fluid concentration of mmp-8 is elevated in non-allergic eosinophilic conjunctivitis and correlates with conjunctival inflammatory cell infiltration. ..........44

Kervanto-Seppälä Sari, Pietilä Ilpo, Meurman Jukka H., Kerosuo Eero
Pit and fissure sealants in dental public health - application criteria and general policy in Finland. .................................................................45

Könönen Mauno
Critical commentary 3: Evaluation of the research diagnostic criteria for temporomandibular disorders for the recognition of an anterior disc displacement with reduction. .........................................................................................46

Korpi J. T, Åström P, Lehtonen N., Tjäderhane Leo, Kallio-Pulkkinen S., Siponen M., Sorsa Timo, Pirilä Emma, Salo Tuula
Healing of extraction sockets in collagenase-2 (matrix metalloproteinase-8)-deficient mice...........................................................................46

Kotilainen Johanna, Pohjola Pia, Pirinen Sinikka, Arte Sirpa, Nieminen Pekka
Premolar hypodontia is a common feature in Sotos syndrome with a mutation in the NSD1 gene...........................................................................47

Kuula Heidi, Salo Tuula, Pirilä Emma, Tuomainen Anita, Jauhiainen Matti, Bykov Igor L., Törmäkangas Liisa, Lindros Kai, Käkelä Reijo, Alfthan, Georg, Salminen Irma, Jauhiainen Matti, Uitto Veli-Jukka, Tjäderhane Leo, Pussinen Pirkko, Sorsa Timo
Local and systemic responses in matrix metalloproteinase 8-deficient mice during Porphyromonas gingivalis-induced periodontitis. ..................................................47

Kylänpää Leena, Hagström Jaana, Lepistö Anna, Linjama Tiina, Kärkkäinen Päivi, Kivivuoto Tuula, Haglund Caj
Syndecan-1 and tenascin expression in cystic tumors of the pancreas.................48
Laisi S, Ess A, Sahlberg C, Arvio P, Lukinmaa Pirjo-Liisa, Alaluusua Satu
Amoxicillin may cause molar incisor hypomineralization. ........................................... 49

Lindholm Harri, Sinisalo Juha, Ahlberg Jari, Jahkola Antti, Partinen Markus, Hublin Christer, Savolainen Aslak
High job control enhances vagal recovery in media work............................................. 49

Mesimäki Karri, Lindroos B., Törnwall Jyrki, Mauno J., Lindqvist Christian, Kontio R., Miettinen S., Suuronen Riitta
Novel maxillary reconstruction with ectopic bone formation by GMP adipose stem cells. ..................................................................................................................... 50

Meurman Jukka H, Pärnänen Pirjo, Kari Kirsti, Samaranayake Lakshaman
Effect of amine fluoride-stannous fluoride preparations on oral yeasts in the elderly: a randomised placebo-controlled trial. ......................................................... 50

Meurman Jukka H, Tarkkila L, Tiitinen Aila
The menopause and oral health..................................................................................... 51

Mohebbi S. Z, Virtanen Jorma, Vahid-Golpayegani M, Vehkalahti Miira
A cluster randomised trial of effectiveness of educational intervention in primary health care on early childhood caries. ................................................................. 52

Murtomaa Heikki
Dental education in Europe. ......................................................................................... 52

Nieminen Mikko T, Uittamo Johanna, Salaspuro Mikko, Rautemaa Riina
Acetaldehyde production from ethanol and glucose by non-Candida albicans yeasts in vitro. .......................................................................................................................... 52

Nieminen Pekka
Genetic basis of tooth agenesis. .................................................................................... 53
Nihtilä Annamari, Widström E.
Heavy use of dental services among Finnish children and adolescents. ............... 54

Nomura Royta, Nakano Kazuhiko, Taniguchi Naho, Lapirattanakul Jinthana, Nemoto Hirotoshi, Grönroos Lisa, Alaluusua Satu, Ooshima Takashi
Molecular and clinical analyses of the gene encoding the collagen-binding adhesin of Streptococcus mutans........................................................................................................... 55

Nymark Mariann, Pussinen Pirkko, Tuomainen Anita, Forsblom Carol, Groop Per-Henrik, Lehto Markku; FinnDiane Study Group
Serum lipopolysaccharide activity is associated with the progression of kidney disease in Finnish patients with type 1 diabetes. ......................................................... 55

Effects of inhaled corticosteroids on metalloproteinase-8 and tissue inhibitor of metalloproteinase-1 in the airways of asthmatic children. ........................................... 56

Oksaharju Anna, Lappalainen Jani, Tuomainen Anita, Pussinen Pirkko, Puolakkainen Mirja, Kovanen Petri, Lindstedt Ken
Pro-atherogenic lung and oral pathogens induce an inflammatory response in human and mouse mast cells.............................................................. 57

Paju Susanna, Pussinen Pirkko, Suominen-Taipale Liisa, Hyvönen Mari, Knuuttila Matti, Könönen Eija
Detection of multiple pathogenic species in saliva is associated with periodontal infection in adults................................................................. 57

Palotie Ulla, Vehkalahti Miira
Finnish dentists’ perceptions of the longevity of direct dental restorations ............. 58

Pärnänen Pirjo, Meurman Jukka H, Virtanen Ismo
Laminin-511 and fibronectin degradation with Candida yeast................................. 58
Pavlic Alenka, Waltimo-Sirén Janna
Clinical and microstructural aberrations of enamel of deciduous and permanent teeth in patients with autoimmune polyendocrinopathy-candidiasis-ectodermal dystrophy.
............................................................................................................................. 59

Pavlic Alenka, Waltimo-Sirén Janna
Clinical and microstructural aberrations of enamel of deciduous and permanent teeth in patients with autoimmune polyendocrinopathy-candidiasis-ectodermal dystrophy.
............................................................................................................................. 60

Pesonen Erkki, El-Segaier Milad, Persson Kenneth, Puolakkainen Mirja, Sarna Seppo, Öhlin Hans, Pussinen Pirkko
Infections as a stimulus for coronary occlusion, obstruction, or acute coronary syndromes................................................................. 60

Pirhan D, Atilla G, Emingil Gülñur, Tervahartiala Taina, Sorsa Timo, Berdeli A.
MMP-13 promoter polymorphisms in patients with chronic periodontitis : effects on GCF MMP-13 levels and outcome of periodontal therapy........................................... 61

Rahkonen Leena, Rutanen Eeva-Marja, Unkila-Kallio Leila, Nuutila Mika, Nieminen Pekka, Sorsa Timo, Paavonen Jorma
Factors affecting matrix metalloproteinase-8 levels in the vaginal and cervical fluids in the first and second trimester of pregnancy. ....................................................... 62

Rautelin Hilpi, Oksanen Aino M, Veijola Lea I, Sipponen Pentti I, Tervahartiala Taina, Sorsa Timo, Lauhio Anneli
Enhanced systemic matrix metalloproteinase response in Helicobacter pylori gastritis. .............................................................................. 63

Richardson Malcolm, Rautemaa Riina
How the host fights against Candida infections........................................... 63
Ruokonen Hellevi, Helve Tapani, Arola Johanna, Hietanen Jarkko, Lindqvist Christian, Hagstrom Jaana
"Strawberry like" gingivitis being the first sign of Wegener's granulomatosis. ........64

Rusanen Peter, Siikala Emilia, Uittamo Johanna, Richardson Malcolm, Rautemaa Riina
A novel method for sampling the microbiota from the oral mucosa..................64

Saied-Moallemi Z, Virtanen Jorma, Vehkalahti Miira, Tehranchi A, Murtomaa Heikki
School-based intervention to promote preadolescents' gingival health: a community trial. .................................................................65

Sakalauskiene Zana, Maciulskiene Vita, Vehkalahti Miira, Kubilius Ricardas, Murtomaa Heikki
Characteristics of dental attendance among Lithuanian middle-aged university employees.................................................................66

Santos Juliana, Carrilho Marcela, Tervahartiala Taina, Sorsa Timo, Breschi Lorenzo, Mazzoni Annalisa, Pashley David, Tay Franklin, Ferraz Caio, Tjäderhane Leo
Determination of matrix metalloproteinases in human radicular dentin. .............66

Sargeran Katayoun, Murtomaa Heikki, Safavi Seyed Mohammad, Vehkalahti Miira, Teronen Olli
Survival after lip cancer diagnosis.................................................................67

Sargeran Katayoun, Murtomaa Heikki, Safavi Seyed Mohammad, Teronen Olli
Delayed diagnosis of oral cancer in Iran: challenge for prevention.................67

Söder P. O, Meurman Jukka H, Jogestrand T, Nowak J, Söder B.
Matrix metalloproteinase-9 and tissue inhibitor of matrix metalloproteinase-1 in blood as markers for early atherosclerosis in subjects with chronic periodontitis. 68
Sipilä Kirsi, Ylöstalo Pekka, Könönen Mauno, Uutela Antti, Knuuttila M.
Association of sense of coherence and clinical signs of temporomandibular disorders. .......................................................... 69

Stamatova Iva, Meurman Jukka H.
Probiotics and periodontal disease. ................................................................. 69

Stamatova Iva, Meurman Jukka H.
Probiotics: Health benefits in the mouth ...................................................... 70

Stamatova I, Kari Kirsti, Vladimirov S, Meurman Jukka H.
In vitro evaluation of yoghurt starter lactobacilli and Lactobacillus rhamnosus GG adhesion to saliva-coated surfaces. ................................................................. 70

Suojanen Juho, Salo Tuula, Koivunen Erkki, Sorsa Timo, Pirlilä Emma.
A novel and selective membrane type-1 matrix metalloproteinase (MT1-MMP) inhibitor reduces cancer cell motility and tumor growth........................................ 71

Suojanen Juho, Sorsa Timo, Salo Tuula 
Tranexamic acid can inhibit tongue squamous cell carcinoma invasion in vitro..... 71

Suomalainen Anni, Apajalahti Satu, Kuhlefelt M, Hagström Jaana
Simple bone cyst: a radiological dilemma....................................................... 72

Suomalainen Anni, Kiljunen Timo, Käser Yvonne, Peltola Jaakko, Kortesniemi Mika
Dosimetry and image quality of four dental cone beam computed tomography scanners compared with multislice computed tomography scanners......................... 72

Cynical hostility as a determinant of poor oral health status in an adult population. 73
Thorén Hanna, Iso-Kungas Petri, Iizuka Tateyuki, Lindqvist Christian, Törnwall Jyrki
Changing trends in causes and patterns of facial fractures in children..................... 74

Thorén Hanna, Snäll Johanna, Kormi Eeva, Numminen Laura, Fäh Reto, Iizuka Tateyuki, Lindqvist Christian, Törnwall Jyrki
Does perioperative glucocorticosteroid treatment correlate with disturbance in surgical wound healing after treatment of facial fractures? A retrospective study. ... 74

Tseveenjav Battsetseg, Virtanen Jorma, Wang N. J, Widström E.
Working profiles of dental hygienists in public and private practice in Finland and Norway. ................................................................................................................ 75

Uittamo Johanna, Siikala Emilia, Kaihovaara Perti, Salaspuro Mikko, Rautemaa Riina
Chronic candidosis and oral cancer in APECED-patients : production of carcinogenic acetaldehyde from glucose and ethanol by Candida albicans. ............ 75

Virtanen Jorma, Suomalainen Kimmo, Aarnio M, Silenti M, Murtomaan Heikki
Effect of directorial intervention on web-based student feedback. ......................... 76

Veistinen Lotta, Åberg Thomas, Rice David
Convergent signalling through Fgfr2 regulates divergent craniofacial morphogenesis.............................................................. 76

Vyšniauskaite Sonata, Vehkalahti Miira
Impacts of toothbrushing frequency on periodontal findings in a group of elderly Lithuanians. ............................................................. 77

Wilson Carole L, Schmidt Amy P, Pirilä Emma, Valore Erika V, Ferri Nicola, Sorsa Timo, Ganz Tomas, Parks William C.
Differential processing of {alpha}- and {beta}-defensin precursors by Matrix Metalloproteinase-7 (MMP-7). ....................................................... 78
Yazdani Reza, Vehkalahti Miira, Nouri Mahtab, Murtomaa Heikki
School-based education to improve oral cleanliness and gingival health in adolescents in Tehran, Iran. .............................................................. 78

ARTICLES IN FINNISH

Besuch Kirsten, Lahti Helena, Apajalahti Satu, Kotiranta Anja
Opiskelijoiden tekemien juurihoitojen tekninen taso todettiin hyväksi. ............... 80

Ekholm Marja, Peltola Jaakko
Tietokoneen näyttö ja käyttöympäristön valaistus ovat digitaalisen röntgenkuvan laatutekijöitä. ........................................................................ 81

Kotiranta Anja, Alaluusua Satu
Karieksen synty, eteneminen ja pysäyttäminen. ..................................................... 82

Lahtinen Aira, Ainamo Anja
Antimikrobiset suuvedet ovat oikein käytettyinä hyödyllisiä............................. 82

Lahtinen Aira, Ainamo Anja
Antimikrobiset suuvedet vähentävät oikein käytettyinä suun mikrobe ja ientulehdusta......................................................................................... 83

Lehtonen Lasse, Virtanen Jorma
Hammaslääkärinöimen harjoittamisen valvonta.................................................... 84

Meurman Jukka H.
Amalgaami. ........................................................................................................ 84

Meurman Jukka H.
Darwinismi. ........................................................................................................ 84
Meurman Jukka H.
Fletcherismi. ................................................................. 85

Meurman Jukka H.
Sikainfluenssa. .............................................................. 85

Meurman Jukka H.
Suun ja hampaiden paikallishoitoaineet ........................................ 85

Meurman Jukka H.
Tumman suklaan lumo. .......................................................... 85

Meurman Jukka H.
Vuoden 2008 fysiologian ja lääketieteen Nobelin palkinot virustutkijoille. .......... 85

Ruohonen Rauni, Kotilainen Hannele, Rautemaa-Richardsson Riina, Mattila Eero, Pitkäranta Anne, Lauhio Anneli
Tuberkuloosi aikuisen kaulalla. .................................................... 86

Sorsa Timo, Tjäderhane Leo, Salo Tuula
Koulutus ei ratkaise hammaslääkäripulaa. .......................................... 87

Takala Esa-Pekka, Toivonen Risto, Vataja Katariina, Murtooma Heikki, Virtanen Jorma
Hammaskiven poisto rasittaa eniten kättä. ........................................ 87

Waltimo-Siren Janna
Ääntöelimistön kehitys. .............................................................. 87

INDEX OF AUTHORS .......................................................................................................................... 88
The aim of the present study was to assess oral health and treatment needs among adult Iranians according to socio-demographic status, smoking, and oral hygiene, and to investigate the relationships between these determinants and oral health.

Data for 4448 young adult (aged 18) and 8301 middle-aged (aged 35 to 44) Iranians were collected in 2002 as part of a national survey using the World Health Organization (WHO) criteria for sampling and clinical diagnoses, across 28 provinces by 33 calibrated examiners. Gender, age, place of residence, and level of education served as socio-demographic information, smoking as behavioural and modified plaque index (PI) as the biological risk indicator for oral hygiene. Number of teeth, decayed teeth (DT), filled teeth (FT), decayed, missing, filled teeth (DMFT), community periodontal index (CPI), and prosthodontic rehabilitation served as outcome variables of oral health.

Mean number of DMFT was 4.3 (Standard deviation (SD) = 3.7) in young adults and 11.0 (SD = 6.4) among middle-aged individuals. Among young adults the D-component (DT = 70%), and among middle-aged individuals the M-component (60%) dominated in the DMFT index.

Among young adults, visible plaque was found in nearly all subjects. Maximum (max) PI was associated with higher mean number of DT, and higher periodontal treatment needs. A healthy periodontium was a rare condition, with 8% of young adults and 1% of middle-aged individuals having a max CPI = 0. The majority of the CPI findings among young adults consisted of calculus (48%) and deepened periodontal pockets (21%). Respective values for middle-aged individuals were 40% and 53%. Having a deep pocket (max CPI = 4) was more likely among young adults with a low level of education (Odds ratio (OR) = 2.7, 95% Confidence interval (CI) = 1.9–4.0) than it was among well-educated individuals. Among middle-aged individuals, having calculus or a periodontal pocket was
more likely in men (OR = 1.8, 95% CI = 1.6–2.0) and in illiterate subjects (OR = 6.3, 95% CI = 5.1–7.8) than it was for their counterparts.

Among young adults, having 28 teeth was more (p < 0.05) prevalent among men (72% vs. 68% for women), urban residents (71% vs. 67% for rural residents), and those with a high level of education (73% vs. 60% for those with a low level). Among middle-aged individuals, having a functional dentition was associated with younger age (OR = 2.0, 95% CI = 1.7–2.5) and higher level of education (OR = 1.8, 95% CI = 1.6–2.1).

Of middle-aged individuals, 2% of 35- to 39-year-olds and 5% of those aged 40 to 44 were edentulous. Among the dentate subjects (n = 7,925), prosthodontic rehabilitation was more prevalent (p < 0.001) among women, urban residents, and those with a high level of education than it was among their counterparts. Among those having 1 to 19 teeth, a removable denture was the most common type of prosthodontic rehabilitation. Middle-aged individuals lacking a functional dentition were more likely (OR = 6.0, 95% CI = 4.8–7.6) to have prosthodontic rehabilitation than were those having a functional dentition.

In total, 81% of all reported being non-smokers, and 32% of men and 5% of women were current smokers. Heavy smokers were the most likely to have deepened periodontal pockets (max CPI ≥ 3, OR = 2.9, 95% CI = 1.8–4.7) and to have less than 20 teeth (OR = 2.3, 95% CI = 1.5–3.6).

The findings indicate impaired oral health status in adult Iranians, particularly those of low socio-economic status and educational level. The high prevalence of dental plaque and calculus and considerable unmet treatment needs call for a preventive population strategy with special emphasis on the improvement of oral self-care and smoking cessation to tackle the underlying risk factors for oral diseases in the Iranian adult population.

ARRESTIN OCCLUSAL ENAMEL CARIES LESIONS WITH PIT AND FISSURE SEALANTS.

KERVANTO-SEPPÄLÄ SARI

The aim of this study was to evaluate the feasibility of pit and fissure sealants and the effectiveness of the two sealant methods applied in every-day practice in public dental health care in Finland.

Two sealant methods were evaluated according to their effectiveness in preventing dentin caries and sealant retention. Application time with these sealant methods was compared. The survival rate of sealed first and second molars was followed for nine and 13 year
periods, respectively. Caries risk evaluation and observed increased caries risk were the basis for considering sealant application.

A questionnaire, sent to all public dental health centers in Finland, monitored the attitudes of the dental profession towards sealant application and explored the current policies used as well as changes noted in the sealant application protocol. DMFT (Decayed, Missing or Filled Teeth) index values collected from the health centers were evaluated.

The difference in caries rate between two methods investigated was highly significant. When compared to the glass ionomer sealant method (GIC), the effectiveness of the resin-based method (RB) in preventing dentin caries was 74% and the rate difference 3%. The relative risk for RB-sealed surfaces vs. GIC-sealed surfaces of having detectable dentin caries was 0.3 (95% CI 0.12, 0.57). The retention rate of sealants was higher with RB than GIC (P<0.001). Application of RB sealant material was less time-consuming than application of GIC sealant. Occlusal dentin caries lesions were found in 4% and proximal caries in less than 2% of sealed teeth. The majority of respondents reported application of sealants on a systematic basis along with caries-risk evaluation. Those health centers sealing over suspected or detected enamel caries had lower average DMFT index values (1.0) when compared to DMFT values (1.2) of health centers applying sealants by alternative criteria.

It is concluded that the RB sealant method is more effective than the GIC sealant method in preventing dentin caries. Sealant maintenance may increase the costs of a sealant program. Occlusal caries management may be improved if the applied sealant policies are changed towards an interceptive approach i.e. applying the sealants over detected or suspected enamel caries lesions instead of sealing sound teeth in a preventive manner.

PERIODONTITIS AND PERI-IMPLANTITIS BIOMARKERS IN HUMAN ORAL FLUIDS AND THE NULL-ALLELE MOUSE MODEL.

KUULA HEIDI

Tissue destruction associated with the periodontal disease progression is caused by a cascade of host and microbial factors and proteolytic enzymes. Aberrant laminin-332 (Ln-332), human beta defensin (hBD), and matrix metalloproteinase (MMP) functions have been found in oral inflammatory diseases. The null-allele mouse model appears as the next step in oral disease research. The MMP-8 knock-out mouse model allowed us to clarify the involvement of MMP-8 in vivo in oral and related inflammatory diseases where MMP-8 is suggested to play a key role in tissue destruction.

The cleaved Ln-332 γ2-chain species has been implicated in the apical migration of sulcular epithelial cells during the formation of periodontal pockets. We demonstrated
that increased Ln-332 fragment levels in gingival crevicular fluid (GCF) are strongly associated with the severity of inflammation in periodontitis. Porphyromonas gingivalis trypsin-like proteinase can cleave an intact Ln-332 γ2-chain into smaller fragments and eventually promote the formation of periodontal pockets. hBDs are components of an innate mucosal defense against pathogenic microbes. Our results suggest that P. gingivalis trypsin-like proteinase can degrade hBD and thus reduce the innate immune response.

Elevated levels and the increased activity of MMPs have been detected in several pathological tissue-destructive conditions where MMPs are shown to cleave extracellular matrix (ECM) and basement membrane (BM) molecules and to facilitate tissue destruction. Elevated levels of MMP-8 have been reported in many inflammatory diseases. In periodontitis, MMP-8 levels in gingival crevicular fluid (GCF) and in peri-implant sulcular fluid (PISF) are elevated at sites of active inflammation, and the increased levels of MMP-8 are mainly responsible for collagenase activity, which leads to tissue destruction. MMP-25, expressed by neutrophils, is involved in inflammatory diseases and in ECM turnover. MMP-26 can degrade ECM components and serve as an activator of other MMP enzymes. We further confirmed that increased levels and activation of MMP-8, -25, and -26 in GCF, PISF, and inflamed gingival tissue are associated with the severity of periodontal/peri-implant inflammation.

We evaluated the role of MMP-8 in P. gingivalis-induced periodontitis by comparing MMP-8 knock-out (MMP8-/-) and wild-type mice. Surprisingly, MMP-8 significantly attenuated P. gingivalis-induced site-specific alveolar bone loss. We also evaluated systemic changes in serum immunoglobulin and lipoprotein profiles among these mouse groups. P. gingivalis infection increased HDL/VLDL particle size in the MMP-8-/- mice, which is an indicator of lipoprotein responses during systemic inflammation. Serum total LPS and IgG antibody levels were enhanced in both mice groups. P. gingivalis-induced periodontitis, especially in MMP-8-/- mice, is associated with severe alveolar bone loss and with systemic inflammatory and lipoprotein changes that are likely to be involved in early atherosclerosis.

SUUPATOLOGIAN MIKROSKOOPPIKURSSI

LUKINMAA PIRJO-LIISA
RESTORATIVE TREATMENT PRACTICES AND DENTIST-RELATED FACTORS.

PALOTIE ULLA

This study aimed at elucidating real-life aspects of restorative treatment practices. In addition, dentists' views and perceptions of and variation in restorative treatment practices with respect to dentist-related factors were evaluated.

Reasons for placement and replacement of restoration, material selection, posterior restoration longevity, and the use of local anesthesia were assessed on two cross-sectional data sets. Data from the Helsinki Public Dental Service (PDS) included details on 3057 restorations performed by dentists (n=134) during routine clinical work in 2001. The other PDS data from Vantaa were based on 205 patient records of young adults containing information on 1969 restorations investigated retrospectively from 1994-1996 backwards; 51 dentists performed the restorations. In addition, dentists’ self-reported use of local anesthesia and estimates of restoration longevity were investigated by means of a nationwide questionnaire sent to 592 general dental practitioners selected by systematic sampling from the membership list of the Finnish Dental Association in 2004. All data sets included some background information on dentists such as gender, year of birth or graduation, and working sector.

In PDS in 2001, primary caries was the reason for placement of restoration more often among patients aged under 19 years than among older patients (p<0.001). Among patients over 36 years of age, replacements represented the majority. Regarding dentist-related factors, replacements of restorations were made by younger dentists more frequently than by older dentists (p<0.001). In PDS in 1994-1996, the replacement rate of posterior restorations was greater among female dentists than among male dentists (p=0.01), especially for amalgams (p=0.008). The mean age of replaced posterior restoration among young adults was 8.9 (SD 5.2) years for amalgam and 2.4 (SD 1.4) years for tooth-colored restorations, the actual replacement rate for all existing posterior restorations being 7% in PDS in 1994-1996. Of all restorative materials used, a clear majority (69%) were composites in PDS in 2001. Local anesthesia was used in 48% of cases and more frequently for older patients (55%) than for patients aged under 13 years (35%) (p<0.001). Younger dentists more often used local anesthesia for primary restoration than did the older dentists (p<0.001), especially for primary teeth (p=0.005). Working sector had an impact on dentists’ self-reported use of local anesthesia and estimates of restoration longevity; public sector dentists reported using local anesthesia more frequently than private sector dentists for Class II (p=0.04) and for Class III restorations (p=0.01). Private sector dentists gave longer estimates of posterior composite longevity than public sector dentists (p=0.001).

In conclusion, restorative treatment practices seem to vary according to patient age and
also dentist-related factors. Replacements of restorations are common for adults. For children, clear underuse of local anesthesia prevails.

STUDIES ON MATRIX METALLOPROTEINASE (MMP-2, -9, AND -14) AND B2 INTEGRIN TARGETING AS POTENTIAL ANTICANCER THERAPEUTICS

SUOJANEN JUHO

Proteolytic enzymes, such as matrix metalloproteinases (MMP), are associated to the progression of several cancers. They degrade extracellular components, which helps tumors to expand and cancer cells to escape from the primary site. Of all MMPs, gelatinases (MMP-2 and -9) and membrane type-1 matrix metalloproteinase (MT1-MMP, MMP-14), in particular, are often associated to more aggressive types of head and neck carcinomas as well as to a poorer outcome in patient survival. Although therapies during the last decades have advanced, the mortality of the disease is still rather high and adjuvant therapies are searched for continuously. MMP-9 and MT1-MMP are also involved in neo-angiogenesis, which is necessary for tumor expansion. For this reason, we have identified synthetic peptides-targeting gelatinases and MT1-MMP, and have also evaluated their anticancer effects in vitro and in vivo. Antigelatinolytic peptides effectively inhibited tongue-carcinoma cell invasion and reduced the growth of xenografted tumors. In tumor samples of mice that were treated with antigelatinolytic peptides, the micro-vessel density was significantly reduced. We also identified a novel MT1-MMP targeting peptide and demonstrated that it exerted anticancer effects against several malignant cell lines in vitro. The effects of MT1-MMP inhibition on tongue-squamous cell carcinomas were evaluated by using xenograft tumors, which it effectively inhibited. Tranexamic acid was also demonstrated to inhibit tongue-squamous cell carcinoma invasion, most probably due to its ability to prevent the plasmin-mediated activation of proMMP-9. Leukocyte β2 integrins are another interesting option when evaluating targets for the therapeutic intervention of inflammatory conditions or malignancies of hematopoietic origin, since β2 integrins are expressed mainly by leukocytes. We identified a novel technique for screening small-molecule libraries against β2 integrins, and by using this technique we identified a novel αMβ2 integrin-binding chemical (IMB-10). IMB-10 significantly enhances leukocyte adhesion and inhibits their motility. We also demonstrated that IMB-10 can be used to inhibit inflammation and lymphoma growth in vivo. Interestingly, IMB-10 also reduced leukocyte tumor infiltration and inhibited tumor invasion.
Cardiovascular diseases, which presently are considered inflammatory diseases, affect millions of people worldwide. Chronic infections may contribute to the systemic inflammation suggested to increase the risk for cardiovascular diseases. Such chronic infections are periodontitis and Chlamydia pneumoniae infection. They are highly prevalent as approximately 10% of adult population and 30% of people over 50 years old are affected by severe periodontitis and 70-80% of elderly people are seropositive for C. pneumoniae.

Our general aim was to investigate the role of infection and inflammation in atherosclerosis both in animal and human studies. We aimed to determine how the two pathogens alter the atherosclerosis-associated parameters, and how they affect the liver inflammation and lipid composition. Furthermore, we evaluated the association between matrix metalloproteinase-8 (MMP-8), a proteinase playing a major role in inflammation, and the future cardiovascular diseases (CVD) events in a population-based cohort.

For the animal experiments, we used atherosclerosis-susceptible apolipoprotein E deficient (apoE-/-) mice. They were kept in germ free conditions and fed with a normal chow diet. The bacteria were administered either intravenously (A. actinomyctemcomitans) or intranasally (C. pneumoniae). Several factors were determined from serum as well as from aortic and hepatic tissues. We also determined how cholesterol efflux, a major event in the removal of excess cholesterol from the tissues, and endothelial function were affected by these pathogens. In the human study, serum MMP-8 and its tissue inhibitor (TIMP-1) concentrations were measured and their associations during the follow-up time of 10 years with CVD events were determined.

An infection with A. actinomyctemcomitans increased concentrations of inflammatory mediators, MMP production, and cholesterol deposit in macrophages, decreased lipoprotein particle size, and induced liver inflammation. C. pneumoniae infection also elicited an inflammatory response and endothelial dysfunction, as well as induced liver inflammation, microvesicular appearance and altered fatty acid profile. In the population-based cohort, men with increased serum MMP-8 concentration together with subclinical atherosclerosis (carotid artery intima media thickness > 1mm) had a three-fold increased risk for CVD death during the follow-up.

The results show that infections with A. actinomyctemcomitans and C. pneumoniae induce proatherogenic changes, as well as affect the liver. These data therefore support the concept that common infections have systemic effects and could be considered as cardiovascular risk factors. Furthermore, our data indicate that, as an independent
predictor of fatal CVD event, serum MMP-8 could have a clinical significance in diagnosing cardiovascular diseases.

ORAL HEALTH BEHAVIOUR, CONDITIONS AND CARE AMONG DENTATE ELDERLY PATIENTS IN LITHUANIA.

VYSNIAUSKAITE SONATA

The present cross-sectional study aimed to assess oral health behaviour, dental and periodontal conditions, dental care, and their relationships among elderly dentate patients in Lithuania.

The target population in the study were dentate patients aged 60 and older attending public dental services in Kedainiai, Lithuania. The data collection took place between the autumn of 1999 and the winter of 2001. Data were collected by means of a self-administered questionnaire for all (n=174) and a clinical examination targeting about half of the subjects (n=100). The questionnaire inquired about oral health behaviour, the life-first and also the most recent dental treatments, sources on and self-assessed knowledge of oral self-care, a self-reported number of teeth, and socio-demographic information. The clinical examination included basic dental and periodontal conditions.

A total of 82 women and 92 men completed the questionnaire; their mean age was 69.2 and their average number of teeth was 16.2 (CI 95% 15.4-17.1). In all, 25% had 21 or more teeth and 32% indicated wearing removable dentures. The oral health behaviour, the participants reported, was poor: 30% reported twice daily toothbrushing, 57% responded that they always use fluoride toothpaste, 19% indicated daily interdental cleaning, nearly all said they take sugar in their coffee and tea, and 30% indicated going for check-ups. As the main source of information on oral self-care, the subjects indicated health professionals (82%), followed by social contacts (72%), broadcasted media (58%), and printed media (42%). A total of 34% assessed their knowledge of oral self-care as good, and their self-assessed knowledge correlated (r=0.52) with professional guidance they had received about oral self-care. In their most recent treatment, conservative (39%) and non-conservative (34%) treatments dominated, and preventive ones were the least reported (7%). Regarding guidance in oral self-care, 54% reported having received such about toothbrushing, 32% about interdental cleaning, and 33% had been given visual information. Clinical examinations revealed the presence of plaque, calculus, bleeding on probing and deepened pockets in all of the subjects; 70% of the subjects were diagnosed with pockets of 6mm and deeper, 94% with caries, and 73% with overhangs of restorations. Those subjects assessing their knowledge of oral self-care as good and reporting a higher intensity of guidance in oral self-care as received, indicated practicing the recommended oral self-care more frequently. Twice daily toothbrushing was
associated with good self-assessed knowledge of oral self-care (OR 4.1, p<0.001) and a university education (OR 5.6, p<0.001). Those subjects with better oral health behaviour had a greater number of teeth. Having 21 or more teeth was associated with good self-assessed knowledge of oral self-care (OR 4.1, p=0.03). Better periodontal conditions were associated with a higher frequency of toothbrushing. The presence of periodontal pockets of 6mm and deeper was associated with the level of self-assessed knowledge of oral self-care being below good (OR=3.0, p=0.04) and the level of dental cleanliness being poor (OR=2.7, p=0.02).

To conclude, oral health behaviour and conditions call for improvement in elderly subjects in Lithuania. To improve the oral health of their elderly dentate patients, dentists should apply all the available tools of chair-side prevention and active guidance. The latter would be an effective means of updating the knowledge of oral self-care and supporting recommended oral health behaviour. A preventive approach should be strongly emphasized in countries with limited resources for oral health care, such as Lithuania.

**DENTAL HEALTH AND SCHOOL-BASED HEALTH EDUCATION AMONG 15-YEAR-OLDS IN TEHRAN, IRAN**

YAZDANI REZA

The aim of the present study was to assess dental health and its determinants among 15-year-olds in Tehran, Iran and to evaluate the impact of a school-based educational intervention on their oral cleanliness and gingival health.

The total sample comprised 506 students. Data collection was performed through a clinical dental examination and a self-administered structured questionnaire. This questionnaire covered the student’s background information, socio-economic status, self-perceived dental health, tooth-brushing, and smoking. The clinical dental examination covered caries experience, gingival status, dental plaque status, and orthodontic treatment needs. Participation was voluntary, and all students responded to the questionnaire. Only three students refused the clinical dental examination. The intervention was based on exposing students to dental health education through a leaflet and a videotape designed for the present study. The outcome examinations took place 12 weeks after the baseline among the three groups of the intervention trial (leaflet, videotape, and control). High participation rates at the baseline and scanty drop-outs (7%) in the intervention speak for reliability of the results.

Mean value of the DMFT (D=decayed, M=missing, and F=filled teeth) index of the 15-year-olds was 2.1, which comprised DT=0.9, MT=0.2, and FT=1.0 with no gender differences. Dental plaque existed on at least one index tooth of all students, and healthy
periodontium (Community Periodontal Index=0) was found in less than 10% of students. Need for caries treatment existed in 40% of students, for scaling in 24%, for oral hygiene instructions in all, and for orthodontic treatment in 26%. Students with the highest level of parents’ education had fewer dental caries (36% vs. 48%) and less dental plaque (77% vs. 88%). Of all students, 78% assessed their dental health as good or better. Even more of those with their DMFT=0 (73% vs. 27%) and DT=0 (68% vs. 32%) assessed their dental health as good or better. Smokers comprised 5% of the boys and 2% of the girls. Smoking was common among students of less-educated parents (6% vs. 3%). Of all students, 26% reported twice-daily tooth-brushing; girls (38% vs. 15%) and those of higher socio-economic background (33% vs. 17%) did so more frequently. The best predictors for a good level of oral cleanliness were female gender or twice-daily tooth-brushing. The present study demonstrated that a school-based educational intervention can be effective in the short term in improving the oral cleanliness and gingival health of adolescents. At least 50% reduction in numbers of teeth with dental plaque compared to baseline was achieved by 58% of the students in the leaflet group, by 37% in the videotape group, and by 10% of the controls. Corresponding figures for gingival bleeding were 72%, 64%, and 30%.

For improving the oral cleanliness and gingival health of adolescents in countries such as Iran with a developing oral health system, school-based educational intervention should be established with focus on oral self-care and oral health education messages. Emphasizing the immediate gains from good oral hygiene, such as fresh breath, clean teeth, and attractive appearance should be key aspects for motivating these adolescents to learn and maintain good dental health, whilst in planning school-based dental health intervention, special attention should be given to boys and those with lower socio-economic status.
ARTICLES IN ENGLISH

SMOKING AND OROFACIAL PAIN-DO WE NEED TO ADD BRUXISM, PSYCHOLOGY, OR SLEEP

AHLBERG JARI

ORAL LICHEN PLANUS AND CHRONIC JUNCTIONAL STOMATITIS : DIFFERENCES IN LYMPHOCYTE SUBPOPULATIONS.

AHMED HAJI OMAR A., HIETANEN JARKKO, KERO MIA, LUKINMAA PIRJO-LIISA, HAGSTRÖM JAANA

Objective. Oral lichen planus (OLP) is an oral counterpart or oral manifestation of the common skin disease lichen planus. Chronic junctional stomatitis (CJS) is a relatively unknown condition characterized by a stromal lymphocyte infiltrate, which is also a diagnostic feature of OLP. The differential diagnosis of OLP and CJS is unclear and they have been suggested to represent variants of the same disease. Material and methods. To investigate possible differences in lymphocyte (sub)populations between these two conditions, we immunostained 10 OLP and 10 CJS specimens for CD1-a, and the lymphocyte markers, CD3, CD4, CD5, CD8, and CD20. We scored the staining results by a four-step grading system and used the Fisher exact test to analyze them statistically. Results. The proportional amount of (CD20 positive) B lymphocytes was higher in CJS than in OLP and the predominance of CD4 positive T lymphocytes over CD8 positive T lymphocytes was stronger in OLP than in CJS. The differences were statistically significant. Conclusion. The results reflect differences in the lymphatic infiltrate between OLP and CJS. Their significance needs further investigation.

DENTINOGENESIS IMPERFECTA TYPE II.

ALALUUSUA SATU, ALAPULLI HEIKKI
144 pp; 270 color ill.2009, pp. 17-23

DEFINITION
Inherited dentin defects have been classified as dentinogenesis imperfect types I (DI-II, DI-II), and III (DI-III), and dentin dysplasia types I (DD-I) and II (DD-II).¹ DI-II, DI-III, and DD-II have been viewed as a continuum of defects and accordingly they have
been mapped to the same region in chromosome 4 and associated with defects in the dentin sialophosphoprotein (DSPP) gene.²

**HYPERTONIC SALINE INJECTIONS TO ENHANCE THE RADIOFREQUENCY THERMAL ABLATION EFFECT IN THE TREATMENT OF BASE OF TONGUE IN OBSTRUCTIVE SLEEP APNEA PATIENTS: A PILOT STUDY**

BÄCK LEIF, LIUKKO TOMMI, RANTANEN IRMA, PELTOLA JAAKKO, PARTINEN MARKKU, YLIKOSKI JUKKA, MÄKITIE ANTTI


CONCLUSION: Hypertonic saline (HS) infiltration in the base of the tongue (BOT) in multilevel radiofrequency ablation (RFA) treatment was followed by significant acute complications in terms of soft tissue swelling. Three patients were defined as cured. No significant changes in the measured parameters were encountered, although, several of them showed a clear trend. New treatment modalities are needed to keep multilevel RFA treatment as a minimally invasive procedure. **OBJECTIVES:** To assess the efficacy and morbidity of RFA of the soft palate (SP) and BOT infiltrated with HS in obstructive sleep apnoea in a prospective, non-randomized clinical study. **PATIENTS AND METHODS:** The inclusion criteria were age between 30 and 65 years, habitual snoring and excessive daytime sleepiness, a body mass index ≤33, and an apnoea-hypopnoea index ≥20. RFA of the SP and the BOT was delivered under local anaesthesia. HS solution was injected before the treatment into the BOT. The morbidity of the procedure was assessed with a visual analogue scale, and efficacy by separate questionnaires and sleep registration. The volume changes induced by the procedure were evaluated with cephalometric radiographs (CRs). **RESULTS:** Twelve males and one female with a median age of 50 years (range 41-62) entered the study. Six patients (46%) had more postoperative swelling in the upper airway than expected. Three patients were defined as cured. The trend in the questionnaires was clear, but not significant. In the soft tissue airway CR measurements no significant changes were encountered, although a trend towards volume reduction was seen in the posterior airway space measure.

**RADIOFREQUENCY SURGERY OF THE SOFT PALATE IN THE TREATMENT OF MILD OBSTRUCTIVE SLEEP APNEA IS NOT EFFECTIVE AS A SINGLE-STAGE PROCEDURE.**

BÄCK LEIF, LIUKKO TOMMI, RANTANEN IRMA, PELTOLA JAAKKO, PARTINEN MARKKU, YLIKOSKI JUKKA, MÄKITIE ANTTI


**OBJECTIVES/HYPOTHESIS:** Radiofrequency (RF) surgery of the soft palate (SP) is an established treatment option for the treatment of snoring. Due to its minimally invasive
character, it has received attention in the management of mild obstructive sleep apnea syndrome (OSAS). STUDY DESIGN: The aim of this study was to assess the efficacy and the occurrence of adverse events after single-stage SP RF surgery in patients with mild OSAS in a randomized single-blinded placebo-controlled trial in an outpatient department at a tertiary care center, academic teaching hospital. METHODS: Thirty-two patients with mild OSAS (apnea-hypopnea index [AHI] 5-15, body mass index <35) were randomized to receive a single session of RF surgery or placebo (insertion of applicator without energy delivery) with local anesthesia. The primary outcome measures were (AHI), Epworth Sleepiness Scale, and a 36-item short-form health survey quality-of-life questionnaire. The secondary measures were the soft tissue airway parameters in cephalometric radiographs, snoring scores, and rates of adverse events. RESULTS: Neither objectively measured significances (active AHI 11.0 [5.0-9.0] to 13.0 [2.0-26.0] and placebo AHI 12.0 [5.0-8.0] to 11.0 [1.0-29.0], P = .628), nor were trends of a diminishing effect on symptoms of mild OSAS found in the treatment arms. No significant changes in the soft tissue airway parameters occurred. One patient (5.9%) in the active treatment group was cured. CONCLUSIONS: RF surgery of SP is not recommended as a single-stage approach in mild OSAS.

ODONTOGENIC INFECTIONS IN THE ETIOLOGY OF INFECTIVE ENDOCARDITIS.

BASCONES-MARTÍNEZ ANTONIO, MUÑOZ-CORCUERA MARTA, MEURMAN JUKKA H.

Revised guidelines for the prevention of infective endocarditis published by the American Heart Association in 2007 do not support the indiscriminate use of antibiotic prophylaxis for dental procedures. However, they still recommend the use of prophylaxis for high-risk patients before dental treatments likely to cause bleeding. Given the high prevalence of bacteremia of dental origin due to tooth-brushing, mastication or other daily activities, it appears unlikely that infective endocarditis from oral microorganisms can be completely prevented. A good oral health status and satisfactory level of oral hygiene are sufficient to control the consequences of the systemic spread of oral microorganisms in healthy individuals. However, caution is still needed and prophylactic antibiotics must be administered to susceptible or medically compromised patients. This review briefly outlines the current concepts of odontogenic bacteraemia and antibiotic prophylaxis for patients undergoing dental treatment.
TOLL-LIKE RECEPTORS 2 AND 5 IN HUMAN GINGIVAL EPITHELIAL CELLS CO-OPERATE WITH T-CELL CYTOKINE INTERLEUKIN-17.

BEKLEN A, SORSA TIMO, KONTTINEN YRJÖ T.

BACKGROUND/AIM: Periodontitis begins as the result of perturbation of the gingival epithelial cells caused by subgingival bacteria interacting with the epithelial cells via pattern recognition receptors. Toll-like receptors (TLRs) have been shown to play an important role in the recognition of periodontal pathogens so we have studied the interaction of TLR ligands with TLR2 and TLR5 for cytokine production in the cultures of gingival epithelial cells. METHODS: Immunohistochemistry was used for the localization of TLR2 and TLR5 in tissue specimens. Enzyme-linked immunosorbent assays were performed to detect the levels of interleukin-1beta (IL-1beta) and tumor necrosis factor-alpha (TNF-alpha), released from gingival epithelial cell cultures following stimulation with TLR ligand alone or in combination with IL-17. RESULTS: Both TLR2 and TLR5 were increased in periodontitis (2128 +/- 159 vs. 449 +/- 59 and 2456 +/- 297 vs. 679 +/- 103, respectively, P < 0.001) including gingival epithelial cells that stained strongly. Cultured gingival epithelial cells stimulated with their respective ligands (HKLM, a TLR2 ligand that is also found in Porphyromonas gingivalis, and flagellin, a TLR5 ligand that is also found in Treponema denticola) produced both IL-1beta and TNF-alpha. To mimic T-cell help, IL-17 was added. This further greatly enhanced TLR ligand-induced IL-1beta (P < 0.001) and TNF-alpha (P < 0.01) production. CONCLUSIONS: These findings show how pathogen-associated molecular patterns, shared by many different periodontopathogenic bacteria, stimulate the resident gingival epithelial cells to inflammatory responses in a TLR-dependent manner. This stimulation may be particularly strong in periodontitis and when T helper type 17 cells provide T-cell help in intercellular cooperation.

THE T-HEALTH INDEX: A COMPOSITE INDICATOR OF DENTAL HEALTH.

BERNABÉ E, SUOMINEN-TAIPALE A. L, VEHKALAHTI MIIRA, NORDBLAD A, SHEIHAM A.

The aim of this study was to determine the most appropriate set of weights with which to calculate the number of sound-equivalent teeth (T-Health index) against perceived oral health, which was used as a proxy of oral health status. This study used data from 5,057 dentate subjects, > or = 30 yr of age, who were participating in the Finnish Health 2000 Survey. Subjects provided information on socio-demographic characteristics, behaviours and perceived oral health, and had a clinical examination. The T-Health index was calculated by assigning different weights to missing, decayed, filled, and sound teeth. Thirty-six alternative sets of weights were evaluated. The most appropriate set of weights was judged by the strength of the adjusted association between the T-Health index and
levels of perceived oral health in ordinal logistic regression models and by the invariance of this association according to the extent of restorative treatment (non-significant statistical interaction). Among the 36 sets of weights used to calculate the T-Health index, assigning twice the weight of a decayed tooth to a filled tooth whilst keeping the weight for a filled tooth \(< 0.20\) provided the strongest association with levels of perceived oral health and did not vary according to the extent of restorative treatment.

**GINGIVAL CREVICULAR FLUID MMP-8 AND -13 AND TIMP-1 LEVELS IN PATIENTS WITH RHEUMATOID ARTHRITIS AND INFLAMMATORY PERIODONTAL DISEASE.**

BIYIKOĞLU B, BUDUNELI N, KARDEŞLER L, AKSU K, PITKÄLÄ M, SORSA TIMO

BACKGROUND: The purpose of this study was to compare gingival crevicular fluid (GCF) levels of matrix metalloproteinase (MMP)-8 and -13 and tissue inhibitor of MMP (TIMP)-1 in patients with rheumatoid arthritis (RA) and systemically healthy counterparts with inflammatory periodontal disease. METHODS: Subjects (N = 74) were divided into five groups: 12 patients with RA and gingivitis; 13 patients with RA and periodontitis; 12 systemically healthy patients with gingivitis; 13 systemically healthy patients with periodontitis; and 24 periodontally and systemically healthy volunteers. Full-mouth clinical periodontal measurements were performed at six sites/tooth. GCF samples obtained from two sites in single-rooted teeth were analyzed by immuno-fluorometric assay and enzyme-linked immunosorbent assay. Data were assessed statistically by parametric tests. RESULTS: The total amounts of MMP-8 were lower in the healthy control group than in RA-gingivitis, RA-periodontitis, and healthy-periodontitis groups (P <0.05). MMP-13 levels were similar in all five study groups (P >0.05). Patients with RA and gingivitis or periodontitis exhibited levels of MMP-8 and -13 and TIMP-1 that were similar to systemically healthy counterparts (P >0.05). CONCLUSIONS: The coexistence of RA and periodontitis did not significantly affect the investigated parameters. GCF MMP-8 levels increased with periodontal inflammation. Despite the long-term usage of corticosteroids and non-steroidal anti-inflammatory drugs, similar GCF MMP-8 and -13 levels in patients with RA and systemically healthy counterparts suggest that RA may create a tendency to overproduce these enzymes.
PERIODONTAL TREATMENT INFLUENCES RISK MARKERS FOR ATHEROSCLEROSIS IN PATIENTS WITH SEVERE PERIODONTITIS.

BUHLIN KÅRE, HULTIN MARGARETA, NORDERYD OLA, PERSSON LENA, POCKLEY A. GRAHAM, PUSSINEN PIRKKO, RABE PER, KLINGE BJÖRN, GUSTAFSSON ANDERS.


This study investigated the effect of mechanical infection control for periodontitis and periodontal surgery on the prevalence of well-established risk factors for atherosclerosis, and plasma levels of cytokines, antibodies against heat shock proteins and markers of systemic inflammation. Sixty-eight patients between 39 and 73 years of age with severe periodontitis who had been referred to four specialist periodontology clinics in Sweden were investigated. A fasting venous blood sample was taken at baseline and additional samples were collected after 3 and 12 months. A total of 54 patients underwent periodontal treatment. The periodontal treatment was successful, as pathogenic gingival pockets decreased significantly. Plasma glucose, lipids and markers of systemic inflammation were not significantly altered after 3 months. One year after the initial treatment, HDL-C concentrations were significantly increased (Delta0.08mmol/L) whereas LDL-C concentrations decreased (Delta0.23mmol/L). Haptoglobin concentrations were also lower. Interleukin-18 and interferon-gamma levels were also lower after 12 months (60ng/L (-23%) and 11ng/L (-97%) respectively). Treatment had no effect on plasma levels of IgA, IgG1, IgG2 antibodies against heat shock proteins. In conclusion, this study indicates that standard treatment for periodontal disease induces systemic changes in several biochemical markers that reflect the risk for atherosclerosis.

TETRACYCLINES AND CHEMICALLY MODIFIED TETRACYCLINE-3 (CMT-3) MODULATE CYTOKINE SECRETION BY LIPOPOLYSACCHARIDE-STIMULATED WHOLE BLOOD.

CAZALIS JULIA, TANABE SHIN-ICHI, GAGNON GUY, SORSA TIMO, GRENIER DANIEL


In addition to their bacteriostatic effect, tetracyclines, which are often used in the treatment of periodontitis, also present anti-inflammatory properties. In the present study, we investigated the effects of tetracycline (TC), doxycycline (doxy), and chemically modified tetracycline-3 (CMT-3) on the production of pro-inflammatory mediators and matrix metalloproteinases (MMPs) in an ex vivo human whole blood (WB) model stimulated with Porphyromonas gingivalis lipopolysaccharide (LPS). WB samples obtained from three periodontitis patients and six healthy subjects were stimulated with P. gingivalis LPS in the absence and presence of TC, doxy, or CMT-3. The secretion of interleukin-1beta (IL-1beta), interleukin-6 (IL-6), interleukin-8 (IL-8), MMP-8, and
MMP-9 by the WB samples was determined using enzyme-linked immunosorbent assays. P. gingivalis LPS significantly increased the secretion of all cytokines and MMPs tested. While we observed inter-patient variations, TC, doxy, and CMT-3 caused reductions of LPS-induced cytokine secretion to various degrees. TC, doxy, and CMT-3 had no significant effect on MMP-8 and MMP-9 secretion by LPS-stimulated WB samples. In conclusion, we used a human WB model that takes into consideration relevant in vivo immune cell interactions in the presence of plasma proteins to show that TC, doxy, and CMT-3 can reduce the production of pro-inflammatory mediators. This property may contribute to the clinically proven benefits of these molecules in the treatment of periodontitis and other chronic inflammatory diseases.

RUNX1 IS INVOLVED IN THE FUSION OF THE PRIMARY AND THE SECONDARY PALATAL SHELVES.

CHAROENCHAIKORN KESINEE, YOKOMIZO TOMOMASA, RICE DAVID, HONJO TADASHI, MATSUZAKI KIYOMI, SHINTAKU YUKO, IMAI YUICHI, WAKAMATSU ASAMI, TAKAHASHI SATORU, ITO YOSHIKI, TAKANO-YAMAMOTO TERUKO, THESLEFF IRMA, YAMAMOTO MASAYUKI, YAMASHIRO TAKASHI.

Runx1 is expressed in medial edge epithelial (MEE) cells of the palatal shelf. Conditionally rescued Runx1−/− mice showed limited clefting in the anterior junction between the primary and the secondary palatal shelves, but not in the junction between the secondary palates. In wild type mice, the fusing epithelial surface exhibited a rounded cobblestone-like appearance, while such cellular prominence was less evident in the Runx1 mutants. We also found that Fgf18 was expressed in the mesenchyme underlying the MEE and that locally applied FGF18 induced ectopic Runx1 expression in the epithelium of the palatal explants, indicating that Runx1 was induced by mesenchymal Fgf18 signaling. On the other hand, unpaired palatal explants cultures revealed the presence of anterior–posterior (A–P) differences in the MEE fates and fusion mechanism. Interestingly, the location of anterior clefting in Runx1 mutants corresponded to the region with different MEE behavior. These data showed a novel function of Runx1 in morphological changes in the MEE cells in palatal fusion, which is, at least in part, regulated by the mesenchymal Fgf signaling via an epithelial–mesenchymal interaction.
A HOLISTIC FOOD LABELLING STRATEGY FOR PREVENTING OBESITY AND DENTAL CARIES.

CINAR AYSE BASAK, MURTOMAA HEIKKI

SUMMARY
Obesity and dental caries in childhood are among the major public health concerns described as a global pandemic because of their global distribution and severe consequences. A consensus has developed as to a recently emerging and alarming common risk factor that leads to the double burden of dental caries and obesity; energy-dense foods (sugar-coated cereals, high-sugar yogurt, soft drinks) are becoming very popular among children because of their dense marketing, cheaper price, increased supply and variety. Implementation of health-promoting and -supporting marketing strategies for healthy food can be one initial cornerstone for successful application of the common risk factor approach in prevention of obesity and dental caries, as also suggested by World Health Organization. Labelling healthy food with a ‘health-friendly’ logo, illustrating that the teeth and the heart are both parts of the whole body (standing side by side supporting each other as close friends), both happy and protected because of consumption of healthy food for the whole body, can promote the foods that are friendly to health of the whole body, implementing the common risk factor approach under a single theme. Labelling healthy food as ‘health-friendly’ based on an international consensus will provide a clear and uniform picture of what is healthy to eat and result in an international integrated programme for prevention of obesity and caries.

ORAL HEALTH-RELATED SELF-EFFICACY BELIEFS AND TOOTHBRUSHING: FINNISH AND TURKISH PRE-ADOLESCENTS’ AND THEIR MOTHERS’ RESPONSES.

CINAR AYSE BASAK, TSEVEENJAV BATTSETSEG, MURTOMAA HEIKKI

PURPOSE: The aim of this study was to investigate the association between cognitive and behavioural factors of preadolescents and those of their mothers, assessed in terms of self-efficacy beliefs and toothbrushing among Turkish and Finnish population in the framework of Social Cognitive Theory. The specific objective was to test if this possible association worked regardless of cultural differences. MATERIALS AND METHODS: Self-administered questionnaires for Finnish (n = 338) and Turkish (n = 611) pre-adolescents and their mothers were used to collect the information on cognitive (pre-adolescent and maternal self-efficacy) and behavioural factors (toothbrushing frequencies). RESULTS: Turkish mothers and pre-adolescents reported lower levels of self-efficacy and toothbrushing than did their Finnish counterparts (P < 0.005). Finnish pre-adolescents reporting high self-efficacy were more likely to have mothers with high levels of self-
efficacy (OR = 2.14, 95% CI = 1.16 to 3.93), (P = 0.014). Similar positive associations emerged between Turkish (OR = 2.45, 95% CI = 1.70 to 3.52), (P = 0.001) and Finnish (OR = 6.76, 95% CI = 2.21 to 20.65), (P = 0.001) pre-adolescent self-efficacy and maternal recommended (twice daily) level of toothbrushing behaviour. For pre-adolescents' toothbrushing, their own self-efficacy was the common explanatory variable. Binary logistic regression models revealed that the maternal toothbrushing accounted for the Turkish pre-adolescents' toothbrushing behaviour, whereas maternal self-efficacy did so for the Finnish pre-adolescents' (P < 0.001) toothbrushing behaviour.

CONCLUSIONS: This study underlines the need for integration of pre-adolescent self-efficacy and maternal cognition and behaviour into oral health intervention programmes because of their relation to recommended toothbrushing behaviour among pre-adolescents, regardless of cultural differences. These findings seem to fit with the Social Cognitive Theory, which emphasises the significance of cultural factors and cognition as the determinants of behaviour.

PERCEIVED BARRIERS TO THE PROVISION OF PREVENTIVE CARE AMONG IRANIAN DENTISTS.

GHASEMI HADI, MURTOMAA HEIKKI, TORABZADEH HASSAN, VEHKALAHTI MIIRA

PURPOSE: The aim of this study was to examine the perceived barriers to preventive dental practice among Iranian dentists. MATERIALS AND METHODS: A questionnaire survey was performed among the dentists who participated in two annual dental meetings (conducted in December 2004 and in July 2005) in Tehran, Iran. The dentists who attended the meeting completed the self-administered questionnaire anonymously. The questionnaire included 12 statements with answer alternatives rated on a 5-point scale to which the dentists were asked to indicate how much each of the 12 items, later classified as three barriers (practice-, dentist- and patient-related), impedes them from practising preventive care. The sum of the scores of the four items in each barrier served as an indicator of each dentist's perception of the strength of each barrier. The background data included dentists' personal and professional characteristics. In total, 1033 dentists completed the questionnaire, of whom 980 (64% men) were eligible. Statistical evaluation was performed using analysis of variance, t test and Pearson's correlation coefficient. RESULTS: Of the respondents, 29% to 66% rated the items of the practice-related barrier as very strong impediments. Corresponding figures for the dentist- and patient-related barriers were 20% to 54% and 70% to 77%, respectively. The highest mean of the score sum was for the patient-related barrier (11.9) and the lowest mean was for the dentist-related barrier (7.9). For both practice- and dentist-related barriers, male dentists reported significantly higher scores than the female dentists (P < 0.001). CONCLUSIONS: The perceived barriers to the provision of preventive care should be meticulously explored and tackled to enhance oral health in Iran.
DOES THE FREQUENCY OF PREVOTELLA INTERMEDIA INCREASE DURING PREGNANCY.

GÜRSOY MERVI, HARALDSSON G, HYVÖNEN M, SORSAPTIMO, PAJUKANTA R, KÖNÖNEN EIJA

INTRODUCTION: The former Bacteroides intermedius, currently including Prevotella intermedia and Prevotella nigrescens, has been associated with hormone-induced pregnancy gingivitis. The aim of the present longitudinal study was to determine whether only P. intermedia or P. nigrescens, or both species, are involved in the demonstrated microbial shift during pregnancy.

METHODS: Subgingival plaque and saliva samples, collected from 30 healthy pregnant women and 24 healthy non-pregnant women as their controls, were examined for the presence of pigmented gram-negative anaerobes. Altogether 2628 isolates were preliminarily identified as P. intermedia sensu lato, based on phenotypic testing. Their further identification was performed by using a 16S ribosomal DNA-based polymerase chain reaction (PCR).

RESULTS: A mean of 8.3 P. intermedia sensu lato isolates from each subject/sampling was examined. During the second trimester, the mean number of P. intermedia sensu lato in plaque increased along with increasing signs of pregnancy gingivitis, and then both decreased. After delivery, gingival inflammation still decreased while the number of P. intermedia sensu lato transiently increased both in plaque and saliva. In the present study, the vast majority of isolates (95.3%) proved to be P. nigrescens and 2.5% were P. intermedia. The remaining 2.2% of the isolates could not be identified with PCR as P. intermedia or P. nigrescens. The corresponding percentages in the control population were 94.2%, 5.5%, and 0.3%.

CONCLUSION: In the oral cavity of relatively young women without periodontitis, P. nigrescens, unlike P. intermedia, is a frequent finding. Conceivably, pregnant women harbor increasing numbers of P. nigrescens associated with pregnancy gingivitis.

ANTI-BIOFILM PROPERTIES OF SATUREJA HORTENSIS L. ESSENTIAL OIL AGAINST PERIODONTAL PATHOGENS.

GÜRSOY ULVI KAHRAMAN, GÜRSOY MERVI, GÜRSOY ORHAN VEDAT, CAKMACKICI LUTFI, KÖNÖNEN EIJA, UITTO VELI-JUKKA

Essential oils of several plants are widely used in ethnomedicine for their antimicrobial and anti-inflammatory properties. However, very limited data exist on their use in connection to periodontal diseases. The aim of the present study was to investigate the bacterial growth inhibiting and anti-biofilm effects of Satureja hortensis L. (summer savory), Salvia fruticosa M. (sage), Lavandula stoechas L. (lavender), Myrtus communis
L., and Juniperus communis L. (juniper) essential oils. Chemical compositions of the essential oils were analyzed by gas chromatography-mass spectrometry, minimum inhibitor concentrations (MICs) with the agar dilution method, and anti-biofilm effects by the microplate biofilm assay. The toxicity of each essential oil was tested on cultured keratinocytes. Of the 5 essential oils, S. hortensis L. essential oil had the strongest growth inhibition effect. Subinhibitory dose of S. hortensis L. essential oil had anti-biofilm effects only against Prevotella nigrescens. Essential oils did not inhibit keratinocyte viability at the concentrations of 1 and 5 microl/ml, however at the concentration of 5 microl/ml epithelial cells detached from the culture well bottom. The present findings suggest that S. hortensis L. essential oil inhibits the growth of periodontal bacteria in the concentration that is safe on keratinocytes, however, in the subinhibitory concentration its anti-biofilm effect is limited.

PREVOTELLA INTERMEDIA ATCC 25611 TARGETS HOST CELL LAMELLIPODIA IN EPITHELIAL CELL ADHESION AND INVASION.

GÜRSOY ULVI KAHRAMAN, KÖNÖNEN EIJA, UITTO VELI-JUKKA

INTRODUCTION: The Prevotella intermedia group bacteria, namely P. intermedia, Prevotella nigrescens, and Prevotella pallens, are phylogenetically closely related and potentially connected with oral and gastrointestinal tract disease pathogenesis. The aim of the present study was to examine whether these species differ in their capabilities of adhesion to and invasion of epithelial cells. METHODS: Adhesion and invasion were assayed by standard antibiotic/culture assays and fluorescent microscopy techniques. The effect of Prevotella strains on epithelial cell viability was measured using a commercial cell proliferation assay. RESULTS: The strains P. intermedia ATCC 25611 and P. nigrescens ATCC 33263 adhered to epithelial cells, the adhesion numbers of P. intermedia being twice as high as those of P. nigrescens. These strains invaded epithelial cells but invasion was weak. The adhesion of P. intermedia was specifically targeted to epithelial cell lamellipodia. The number of adhered P. intermedia cells increased or decreased when the formation of lamellipodia was stimulated or inhibited, respectively. None of the tested strains showed toxic effects on epithelial cells; a clinical P. intermedia strain even increased the number of viable cells by about 20%. CONCLUSION: The results suggest that among the P. intermedia group bacteria, P. intermedia and P. nigrescens type strains can adhere to and invade epithelial cells, the capability of P. intermedia ATCC 25611(T) being highest in this context. This strain proved to have a special affinity in binding to epithelial cell lamellipodia.
SALIVARY INTERLEUKIN-1BETA CONCENTRATION AND THE PRESENCE OF MULTIPLE PATHOGENS IN PERIODONTITIS.

GURSOY ULVI KAHRAMAN, KÖNÖNEN EJJA, UITTO VELI-JUKKA, PUSSINEN PIRKKO, HYVÄRINEN KATI, SUOMINEN-TAIPALE LIISA, KNUUTTILA MATTI

AIM: This study aimed to find salivary enzymes and/or cytokines that would reflect periodontitis, alone or in combination with salivary microbial markers.

MATERIAL AND METHODS: The salivary concentrations of elastase, lactate dehydrogenase, interleukin-1beta (IL-1beta), interleukin-6, and tumour necrosis factor-alpha, and the presence of five periodontal pathogens, Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Prevotella intermedia, Tannerella forsythia, and Treponema denticola, were analysed from salivary specimens of 165 subjects, a subpopulation of Health 2000 Health Examination Survey in Finland; 84 of the subjects had probing pocket depth (PPD) of > or =4 mm at 14 or more teeth (the advanced periodontitis group), while 81 subjects had no teeth with PPD of > or =4 mm (the control group). All subjects had at least 20 teeth and no systemic diseases.

RESULTS: Among the salivary cytokines and enzymes tested, IL-1beta was the only biomarker associated with periodontitis. An association was also found with the presence of multiple periodontal pathogens. Salivary IL-1beta and the presence of multiple periodontal pathogens were associated with periodontitis at the same magnitude, when they were in the logistic regression model individually or together.

CONCLUSION: We suggest that salivary IL-1beta and the presence of multiple periodontal pathogens in saliva should be studied more thoroughly as markers of periodontitis.

EVIDENCE THAT FGF10 CONTRIBUTES TO THE SKELETAL AND VISCERAL DEFECTS OF AN APERT SYNDROME MOUSE MODEL.

HAJIHOSSEINI MOHAMMAD K, DUARTE RAQUEL, PEGRUM JEAN, DONJACOUR ANNE, LANAC-LLOLA EVA, RICE DAVID, SHARPE JAMES, DICKSON CLIVE

Apert syndrome (AS) is a severe congenital disease caused by mutations in fibroblast growth factor receptor-2 (FGFR2), and characterised by craniofacial, limb, visceral, and neural abnormalities. AS-type FGFR2 molecules exert a gain-of-function effect in a ligand-dependent manner, but the causative FGFs and their relative contribution to each of the abnormalities observed in AS remains unknown. We have generated mice that harbour an AS mutation but are deficient in or heterozygous for Fgf10. The genetic knockdown of Fgf10 can rescue the skeletal as well as some of the visceral defects observed in this AS model, and restore a near normal level of FgfR2 signaling involving
an apparent switch between ERK(p44/p42) and p38 phosphorylation. Surprisingly, it can also yield de novo cleft palate and blind colon in a subset of the compound mutants. These findings strongly suggest that Fgf10 contributes to AS-like pathologies and highlight a complexity of Fgf10 function in different tissues.

KEY FACTORS IN SMOKING CESSATION INTERVENTION AMONG 15-16-YEAR-OLDS.

HEIKKINEN ANNA MARIA, BROMS ULLA, PITKÄNIEMI JANNE, KOSKENVUO MARKKU, MEURMAN JUKKA H.
Behavioral medicine. 35 (3): 93-99, 2009

The authors aimed to investigate factors associated with smoking cessation among adolescents after tobacco intervention. They examined smokers (n = 127) from one birth cohort (n = 545) in the city of Kotka in Finland. These smokers were randomized in 3 intervention groups the dentist (n = 44) and the school nurse (n = 42 groups), and a control group (n = 39). After 2 months, the authors sent a follow-up questionnaire to the initial smokers to find out who had quit. The authors found that those whose best friend was a nonsmoker were more likely to stop smoking (relative risk RR 7.0 95% CI 4.6-10.7). Moreover, the nicotine-dependent participants (measured according to the Fagerström Test for Nicotine Dependence(36)) were less likely to stop (RR 0.1 95% CI 0.08-0.11) compared to non-nicotine dependent participants. Last, of the diurnal types, the morning types found it easier to quit smoking than the evening types (RR 2.2 95% CI 1.4-3.6). Thus, the authors concluded that the best friend's influence, nicotine dependence, and diurnal type could be taken more into account in individual counseling on smoking cessation.

ORAL INFLAMMATORY BURDEN AND PRETERM BIRTH.

HEIMONEN AURA, JANKET SOK-JA, KAAJA RISTO, ACKERSON LELAND K, MUTHUKRISHNAN PREETIKA, MEURMAN JUKKA H.

BACKGROUND: Earlier studies on the association between oral inflammation and preterm birth limited the inflammation source to periodontal disease. This might have caused an underestimation of the total inflammatory burden from the oral cavity. METHODS: We conducted a postpartum cross-sectional study of 328 Finnish women with singleton births, of whom 77 had preterm births and 251 had full-term births. Gingival bleeding on probing, probing depth, and the presence of dental calculus and mouth ulcers were recorded; the oral inflammatory burden index (OIBI) was constructed based on these clinical findings. A data-driven oral inflammation score (OIS) was also created by stochastically combining the same parameters assessed independently. We used the t, Mann-Whitney, and chi(2) tests for univariate analyses and multivariate
logistic regression methods to examine the association between OIBI/OIS and preterm birth. The confounders adjusted for were age, smoking (past, present, and never), diabetes (type 1, type 2, and gestational), primiparity, antimicrobial treatment as a proxy for systemic infection, infertility treatment, and weight gain during pregnancy. RESULTS: OIBI was significantly associated with preterm birth after adjusting for confounding factors (odds ratio [OR], 1.85; 95% confidence interval [CI]: 1.10 to 3.10; P = 0.02). Without adjusting for weight gain, OIS was significantly associated with preterm birth (OR, 1.97; 95% CI: 1.09 to 3.57; P = 0.03); however, this association became non-significant after adding weight gain to the model. CONCLUSION: The combined effects of multiple oral infections were significantly associated with preterm birth.

DENTAL AGE IN 6-YEAR-OLD CHILDREN WITH SUBMUCOUS CLEFT PALATE AND CLEFT OF THE SOFT PALATE.
HELIOVAARA ARJA, NYSTRÖM MARJATTA
Acta odontologica Scandinavica. 67 (2) : 80-84, 2009.

OBJECTIVE: To evaluate dental age in 6-year-old children with submucous cleft palate (SMCP) and to compare this in age-matched and sex-matched children with clefts of the soft palate (CPs). MATERIAL AND METHODS: The dental maturity of 73 children (39 girls) with SMCP was evaluated from panoramic radiographs and compared in age-matched and sex-matched controls with CPs. Mean biological age of the children was 6.1, ranging from 5.5 to 6.8 (boys 6.2 years, range 5.7-6.8; girls 6.1 years, range 5.5-6.7). Dental stages were assessed following the method of Demirjian, and dental age was calculated in accordance with the Finnish dental maturity reference values. Student's paired t-test was used in the statistical analysis. RESULTS: There were no significant differences in dental age between the sexes, such that boys and girls were combined in the further analyses. Dental age of the children with SMCP (6.2 years, range 4.9-7.4) was similar to their biological age (NS). Dental age of those with CPs was 0.2 years delayed (dental age 5.9 years, range 4.6-7.5; p<0.001) compared to their biological age. Children with CPs had a lower dental age than children with SMCP (p<0.001). CONCLUSION: Dental maturation in 6-year-old children with submucous cleft palate is not delayed, whereas in children with clefts of the soft palate dental age is slightly delayed.
PROTEOLYTIC ROLES OF MATRIX METALLOPROTEINASE (MMP)-13 DURING PROGRESSION OF CHRONIC PERIODONTITIS: INITIAL EVIDENCE FOR MMP-13/MMP-9 ACTIVATION CASCADE.

HERNÁNDEZ RÍOS M, SORSA TIMO, OBREGÓN F, TERVAHARTIALA TAINA, VALENZUELA M.A, POZO P, DUTZAN N, LESAFFRE E, MOLAS M, GAMONAL J.

AIM: Matrix metalloproteinases (MMP)-13 can initiate bone resorption and activate proMMP-9 in vitro, and both these MMPs have been widely implicated in tissue destruction associated with chronic periodontitis. We studied whether MMP-13 activity and TIMP-1 levels in gingival crevicular fluid (GCF) associated with progression of chronic periodontitis assessed clinically and by measuring carboxy-terminal telopeptide of collagen I (ICTP) levels. We additionally addressed whether MMP-13 could potentiate gelatinase activation in diseased gingival tissue. MATERIALS AND METHODS: In this prospective study, GCF samples from subjects undergoing clinical progression of chronic periodontitis and healthy controls were screened for ICTP levels, MMP-13 activity and TIMP-1. Diseased gingival explants were cultured, treated or not with MMP-13 with or without adding CL-82198, a synthetic MMP-13 selective inhibitor, and assayed by gelatin zymography and densitometric analysis. RESULTS: Active sites demonstrated increased ICTP levels and MMP-13 activity (p<0.05) in progression subjects. The MMP-9 activation rate was elevated in MMP-13-treated explants (p<0.05) and MMP-13 inhibitor prevented MMP-9 activation. CONCLUSIONS: MMP-13 could be implicated in the degradation of soft and hard supporting tissues and proMMP-9 activation during progression of chronic periodontitis. MMP-13 and -9 can potentially form an activation cascade overcoming the protective TIMP-1 shield, which may become useful for diagnostic aims and a target for drug development.

LIFELONG EXPOSURE TO SMOKING AND ORAL HEALTH AMONG 35- TO 44-YEAR-OLD IRANIANS.

HESSARI HOSSEIN, VEHKALAHTI MIIRA, EGHBAL MOHAMMAD J, MURTOMAA HEIKKI

PURPOSE: The objective of this study was to assess the periodontal treatment needs and the dental status in relation to smoking indicators with special emphasis on lifelong exposure to smoking among 35- to 44-year-old Iranian dentate subjects. MATERIALS AND METHODS: Data (N = 8276) were collected as part of a national survey using the World Health Organization criteria for sampling and for using the data as clinical indicators. Gender, age, place of residence and level of education served as sociodemographic information, and community periodontal index (CPI) and number of teeth served
The smoking indicators comprised smoking, duration of smoking (years), daily smoking (cigarettes/day) and lifelong exposure to smoking.

**RESULTS:** In total, 81% of the subjects were non-smokers, and 32% of the males and 5% of the females were current smokers. Maximal CPI = 2 was found among 40% of the subjects, and 53% had maximal CPI > or = 3. Higher periodontal treatment needs were associated with smoking (P < 0.01) in males; CPI = 4 was more frequent (P < 0.01) and the mean number of teeth was lower (P < 0.01) among groups with higher levels of smoking. Heavy smokers were the most likely to have maximal CPI > or = 3 (odds ratios, OR = 2.9; 95% confidence intervals, 95% CI = 1.8 to 4.7) and to have < 20 teeth (OR = 2.3; 95% CI = 1.5 to 3.6). **CONCLUSIONS:** Smoking and lifelong exposure to smoking with a dose-dependent effect seem to be associated with higher periodontal treatment needs and poorer dental status among the middle-aged, particularly in males and in low socioeconomic groups in Iran.

**PRESENCE OF AGGREGATIBACTER ACTINOMYCETEMCOMITANS IN YOUNG INDIVIDUALS : A 16-YEAR CLINICAL AND MICROBIOLOGICAL FOLLOW-UP STUDY.**

HÖGLUND-ÅBERG CAROLA, SJÖDIN BENGT, LAKIO LAURA, PUSSINEN PIRKKO, JOHANSSON ANDERS, CLAESSON ROLF

**AIM:** To look for clinical signs of periodontal disease in young adults who exhibited radiographic bone loss and detectable numbers of Aggregatibacter actinomycetemcomitans in their primary dentition. **MATERIAL AND METHODS:** Periodontal status and radiographic bone loss were examined in each of the subjects 16 years after the baseline observations. Techniques for anaerobic and selective culture, and checkerboard, were used to detect periodontitis-associated bacterial species. The isolated A. actinomyce-temcomitans strains were characterized by polymerase chain reaction. **RESULTS:** Signs of localized attachment loss were found in three out of the 13 examined subjects. A. actinomycetemcomitans was recovered from six of these subjects and two of these samples were from sites with deepened probing depths and attachment loss. Among the isolated A. actinomycetemcomitans strains, serotypes a-c and e, but not d or f, were found. None of the isolated strains belonged to the highly leucotoxic JP2 clone, and one strain lacked genes for the cytolethal distending toxin. **CONCLUSIONS:** This study indicates that the presence of A. actinomycetemcomitans and early bone loss in the primary dentition does not necessarily predispose the individual to periodontal attachment loss in the permanent dentition.
GASTRIC REFLUX IS A SIGNIFICANT CAUSATIVE FACTOR OF TOOTH EROSION.

HOLBROOK W. P, FURUHOLM J, GUDMUNDSSON K, THEODÓRS A, MEURMAN JUKKA H.

Dental erosion is caused by dietary or gastric acid. This study aimed to examine the location and severity of tooth erosion with respect to causative factors, and to determine whether the clinical pattern of erosion reflected the dominant etiological factor. The study involved 249 Icelandic individuals and included: a detailed medical history; clinical oral examination; salivary sampling, and analysis for flow rate, pH, and buffering capacity. Reflux was assessed in 91 individuals by gastroscopy, esophageal manometry, and 24-hour esophageal-pH monitoring. Reflux symptoms were reported by 36.5% individuals. Manometry results were abnormal in 8% of study participants, abnormal esophageal pH in 17.7%, and a pathological 24-hour pH recording in 21.3%. 3.6% were positive for Helicobacter pylori. Normal salivary flow was found in 92%, but low salivary buffering (10.4%) was associated with erosion into dentin (P < 0.05). Significant associations were found between erosion and diagnosed reflux disease (OR 2.772; P < 0.005) and daily consumption of acidic drinks (OR 2.232; P < 0.005).

CLINICAL MANIFESTATIONS AND MANAGEMENT OF PATIENTS WITH AUTOIMMUNE POLYENDOCRINE SYNDROME TYPE I.

HUSEBYE E. S, PERHEENTUPA JAAKKO, RAUTEMAA RIINA, KÄMPE O.

Autoimmune polyendocrine syndrome type I (APS-I) is a monogenic model disease of autoimmunity. Its hallmarks are chronic mucocutaneous candidosis, hypoparathyroidism and adrenal insufficiency, but many other autoimmune disease components occur less frequently. The first components usually appear in childhood, but may be delayed to adolescence or early adult life. There is enormous variation in presentation and phenotype, which makes the diagnosis difficult. Antibodies against interferon-omega and -alpha have recently been shown to be sensitive and relatively specific markers for APS-I, and mutational analysis of the autoimmune regulator gene gives the diagnosis in >95% of cases. The treatment and follow-up of patients is demanding and requires the collaboration of specialists of several fields. However, the literature is especially sparse regarding information on treatment and follow-up; hence, we present here a comprehensive overview on clinical characteristics, treatment and follow-up based on personal experience and published studies.
CHLAMYDIAL AND PERIODONTAL PATHOGENS INDUCE HEPATIC INFLAMMATION AND FATTY ACID IMBALANCE IN APOLIPOPROTEIN E-DEFICIENT MICE.

HYVÄRINEN KATI, TUOMAINEN ANITA, LAITINEN SAARA, BYKOV IGOR L, TÖRMÄKANGAS LIISA, LINDROS KAI, KÄKELÄ REIJO, ALFTHAN GEORG, SALMINEN IRMA, JAUHIAINEN MATTI, KOVANEN PETRI, LEINONEN MAIJA, SAIKKU PEKKA, PUSSINEN PIRKKO

Periodontitis and Chlamydia pneumoniae infection are independent risk factors for cardiovascular diseases. The aim of this study was to investigate the effect of C. pneumoniae and Aggregatibacter actinomycetemcomitans infection on hepatic inflammation and lipid homeostasis of apolipoprotein E-deficient mice. Mice were infected with viable C. pneumoniae intranasally three times for chronic infection or once for acute infection. Viable A. actinomycetemcomitans was administered 10 times intravenously alone or in concert with C. pneumoniae. Hepatic alterations were assessed by histochemistry, lipid quantification, and fatty acid profile analysis. The RNA expression levels and the presence of pathogens in the livers and lungs were detected by quantitative real-time PCR. Both pathogens were detected in the livers of the infected animals. Chronic C. pneumoniae infection induced marked changes in hepatic lipid homeostasis. A. actinomycetemcomitans infection resulted in inflammatory cell infiltration into the liver, accompanied by elevated hepatic RNA expression levels of inflammation-related genes and higher serum amyloid A and lipopolysaccharide concentrations. Our results indicate that proatherogenic pathogens infect the liver, causing proinflammatory alterations and lipid disturbances. This infection may maintain chronic systemic inflammation attributable to atherogenesis.

DETECTION AND QUANTIFICATION OF FIVE MAJOR PERIODONTAL PATHOGENS BY SINGLE COPY GENE-BASED REAL-TIME PCR.

HYVÄRINEN KATI, LAITINEN SAARA, PAJU SUSANNA, HAKALA ANNE, SUOMINEN-TAIPALE LIISA, SKURNIK MIKAEL, KÖNÖNEN EIJA, PUSSINEN PIRKKO.

Periodontitis is a common chronic multibacterial infection in the tooth-supporting tissues. It has been shown that periodontitis patients carry higher number of disease-associated bacteria than healthy ones. The aim of this study was to generate a novel, single copy gene-based quantitative real-time PCR (qPCR) assay for five major periodontal pathogens - Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Prevotella intermedia, Treponema denticola, and Tannerella forsythia. The primer/probe sets were designed for conservative lipopolysaccharide-coding gene regions. They proved to
be sensitive and able to detect strains representing different serotypes of the target bacteria. The specificity of designed primers was tested using 49 selected bacterial species and no false positive or negative results were observed. We validated the assay with a case-control population, including 165 saliva samples, and proved the diagnostic accuracy by Receiver Operating Characteristic (ROC) curves. All quantified pathogens alone were able to distinguish significantly between the subjects with and without periodontitis, and provided areas under the ROC curve larger than 0.5. The total pathogen burden comprising all five species associated with periodontitis with an area of 0.821 (95% CI, 0.758-0.885, P<0.001). Our prominently sensitive and specific assay may have major importance in the diagnosis, prevention, and treatment of periodontitis.

HEREDITARY GELSON AMYLOIDOSIS MIMICKING SJÖGREN'S SYNDROME.

JUUSELA PIRJO, TANSKANEN MARIT, NIEMINEN ANJA, UITTO VELI-JUKKA, BLÅFIELD HARRI, KIURU-ENARI SARI

Hereditary gelsolin amyloidosis (AGel amyloidosis) belongs to the wide group of amyloidotic diseases, which comprise various hereditary but also sporadic forms, such as inflammation-associated AA amyloidosis, primary or myeloma-associated AL amyloidosis and common Alzheimer's disease and type II diabetes-associated local amyloidoses. AGel amyloidosis caused by a gelsolin G654A gene mutation is autosomal dominantly inherited and presents typically in the 30s with progressive corneal lattice dystrophy, followed by cutis laxa and cranial polyneuropathy. Here, we present a case of sicca syndrome, originally diagnosed as primary Sjögren's syndrome (SS) but later found to represent an initial disease manifestation of AGel amyloidosis, not recognised earlier. This case emphasises both the importance of specific amyloid stainings and comprehensive salivary gland histopathology as well as family history in SS differential diagnostics.

TEAR FLUID CONCENTRATION OF MMP-8 IS ELEVATED IN NON-ALLERGIC EOSINOPHILIC CONJUNCTIVITIS AND CORRELATES WITH CONJUNCTIVAL INFLAMMATORY CELL INFILTRATION.

KARI OSMO, MÄÄTTÄ MARKO, TERAHARTIALA TAINA, PELTONEN SIRJE, KARI MARJATTA, HAGSTRÖM JAANA, SORSA TIMO, SAARI MATTI, HAAHTELA TARI

BACKGROUND: To investigate tear fluid concentration of matrix metalloproteinase 8 (MMP-8) and its relation to conjunctival inflammatory cell infiltration in persistent non-allergic eosinophilic conjunctivitis (NAEC). METHODS: Two groups were included: 26
consecutive adult patients with NAEC (conjunctival eosinophils at least 1+ [1-10 eosinophils/slide], skin prick test [SPT] to common allergens negative), and 26 asymptomatic adult persons (no conjunctival eosinophils, SPT negative). MMP-8 tear fluid concentrations were determined by immunofluorometric assay, and conjunctival brush cytology samples from NAEC patients were used for MMP-8 immunocytochemistry. Gelatin zymography was used to illustrate proteolytic activity within the tear fluid samples. RESULTS: The mean MMP-8 concentration was significantly higher among NAEC patients (214.3 +/- 327.7 microg/l) than among healthy persons (50.4 +/- 62.3 microg/l, P < 0.0001). In the NAEC patients, tear fluid MMP-8 correlated with the numbers of conjunctival neutrophils (r = 0.66, P = 0.0002) as well as with goblet cells and columnar epithelial cells (r = 0.54 for both, P = 0.045), but not with the lymphocyte numbers (r = -0.36, P = 0.0741). By immunocytology, MMP-8 protein could also be detected in vivo in the inflammatory cell population within the conjunctiva. Zymography revealed that proteolysis was significantly higher in the NAEC group, and activated enzymes were practically found only in the NAEC group. CONCLUSIONS: The results showed that NAEC is an inflammatory condition characterized by increased tear fluid MMP-8 levels, probably derived from both inflammatory and structural conjunctival cells. The increased proteolytic activity in NAEC patients may indicate risk of conjunctival structural changes (remodeling).

PIT AND FISSURE SEALANTS IN DENTAL PUBLIC HEALTH – APPLICATION CRITERIA AND GENERAL POLICY IN FINLAND.

KERVANTO-SEPPÄLÄ SARI, PIETILÄ ILPO, MEURMAN JUKKA H, KEROSUO EERO

BACKGROUND: Pit and fissure sealants (sealants) are widely used as a non-operative preventive method in public dental health in Finland. Most children under 19 years of age attend the community-organized dental health services free of charge. The aims of this study were to find out to what extent sealants were applied, what the attitudes of dental professionals towards sealant application were, and whether any existing sealant policies could be detected among the health centres or among the respondents in general. The study evaluated changes that had taken place in the policies used during a ten year period (1991-2001). METHODS: A questionnaire was mailed to each chief dental officer (CDO) of the 265 public dental health centres in Finland, and to a group of general dentists (GDP) applying sealants in these health centres, giving a total of 434 questionnaires with 22 questions. The response rate was 80% (N = 342). RESULTS: A majority of the respondents reported to application of sealants on a systematic basis for children with increased caries risk. The criteria for applying sealants and the actual strategies seemed to vary locally between the dentists within the health centres and between the health centres nationwide. The majority of respondents believed sealants had short- and long-term effects. The overall use of sealants decreased towards the end of the ten year period. The health centres (N = 28) choosing criteria to seal over detected or suspected enamel caries
lesion had a DMFT value of 1.0 (SD +/- 0.49) at age 12 (year 2000) compared to a value of 1.2 (SD +/- 0.47) for those health centres (N = 177) applying sealants by alternative criteria (t-test, p < 0.05). CONCLUSION: There seems to be a need for defined guidelines for sealant application criteria and policy both locally and nationwide. Occlusal caries management may be improved by shifting the sealant policy from the traditional approach of prevention to interception, i.e. applying the sealants over detected or suspected enamel caries lesions instead of sealing sound teeth.

CRITICAL COMMENTARY 3: EVALUATION OF THE RESEARCH DIAGNOSTIC CRITERIA FOR TEMPOROMANDIBULAR DISORDERS FOR THE RECOGNITION OF AN ANTERIOR DISC DISPLACEMENT WITH REDUCTION.
KÖNÖNEN MAUNO

HEALING OF EXTRACTION SOCKETS IN COLLAGENASE-2 (MATRIX METALLOPROTEINASE-8)-DEFICIENT MICE.
KORPI J. T, ÅSTRÖM P, LEHTONEN N, TJÄDERHANE LEO, KALLIO-PULKINEN S, SIPONEN M, SORSA TIMO, PIRILÄ EMMA, SALO TUULA

Matrix metalloproteinase-8 (MMP-8) participates in skin wound healing and inflammation. We hypothesized that MMP-8 plays a role in wound healing after tooth extraction and in periapical inflammation. Bone formation, collagen metabolism, and inflammation in tooth extraction socket and in periapical lesions were analyzed in wild-type mice and in MMP-8-deficient (MMP-8(-/-)) mice. New trabecular bone area in the extraction sockets and in periapical lesions were similar in both groups. In extraction sockets significantly more type III procollagen was synthesized, and the neutrophil and MMP-9 levels were lower in MMP-8(-/-) mice. The amount of Fas ligand, identified as a substrate for MMP-8, was lower in alveolar mucosa but higher in alveolar bone of MMP-8(-/-) mice. These results indicate that MMP-8 can modulate inflammation and collagen metabolism of alveolar bone and mucosa.
PREMOLAR HYPODONTIA IS A COMMON FEATURE IN SOTOS SYNDROME WITH A MUTATION IN THE NSD1 GENE.

KOTILAINEN JOHANNA, POHJOLA PIA, PIRINEN SINIKKA, ARTE SIRPA, NIEMINEN PEKKA

The major diagnostic manifestations in Sotos syndrome include frontal bossing, downward slanting palpebral fissures, a prominent jaw, learning disability, and childhood overgrowth. Over 90% of clinically diagnosed patients have an abnormality in the NSD1 gene. We investigated the dental manifestations of this disorder and found one or several premolar teeth were absent in 9 out of 13 (69%) affected children and adolescents. A heterozygous mutation in the NSD1 gene was identified in 12 patients, including all patients with hypodontia. The severity of the hypodontia seemed to increase with the severity of aberration of the NSD1. More than 50% of the patients had enamel defects or excessive tooth wear. Dental age, based on tooth formation, was within the normal range. A characteristic occlusion for Sotos syndrome could not be identified. As agenesis of premolars was a common feature in these patients affected with Sotos syndrome, we recommend panoramic radiography at the age of 7 years. If premolars are missing, proper preventive and restorative care is necessary to maintain the deciduous molars. Copyright 2009 Wiley-Liss, Inc.

LOCAL AND SYSTEMIC RESPONSES IN MATRIX METALLOPROTEINASE 8-DEFICIENT MICE DURING PORPHYROMONAS GINGIVALIS-INDUCED PERIODONTITIS.

KUULA HEIDI, SALO TUULA, PIRILÄ EMMA, TUOMAINEN ANITA, JAUHIAINEN MATTI, BYKOV IGOR L, TÖRMÄKANGAS LIISA, LINDROS KAI, KÄKELÄ REIJO, ALFTHAN GEORG, SALMINEN IRMA, JAUHIAINEN MATTI, UUTTO VELI-JUKKA, TJÄDERHANE LEO, PUSSINEN PIRKKO, SORSAA TIMO

Periodontitis is a bacterium-induced chronic inflammation that destroys tissues that attach teeth to jaw bone. Pathologically excessive matrix metalloproteinase 8 (MMP-8) is among the key players in periodontal destruction by initiating type I collagen degradation. We studied MMP-8 in Porphyromonas gingivalis-induced periodontitis by using MMP-8-deficient (MMP8/-) and wild-type (WT) mice. Alveolar bone loss, inflammatory mediator expression, serum immunoglobulin, and lipoprotein responses were investigated to clarify the role of MMP-8 in periodontitis and systemic inflammatory responses. P. gingivalis infection induced accelerated site-specific alveolar bone loss in both MMP8/- and WT mice relative to uninfected mice. The most extensive bone degradation took place in the P. gingivalis-infected MMP8/- group. Surprisingly, MMP-8 significantly attenuated (P < 0.05) P. gingivalis-induced site-specific alveolar bone loss. Increased
alveolar bone loss in *P. gingivalis*-infected MMP8/− and WT mice was associated with increase in gingival neutrophil elastase production. Serum lipoprotein analysis demonstrated changes in the distribution of high-density lipoprotein (HDL) and very-low-density lipoprotein (VLDL) particles; unlike the WT mice, the MMP8/− mice underwent a shift toward a smaller HDL/VLDL particle sizes. *P. gingivalis* infection increased the HDL/VLDL particle size in the MMP8/− mice, which is an indicator of lipoprotein responses during systemic inflammation. Serum total lipopolysaccharide activity and the immunoglobulin G-class antibody level in response to *P. gingivalis* were significantly elevated in both infected mice groups. Thus, MMP-8 appears to act in a protective manner inhibiting the development of bacterium-induced periodontal tissue destruction, possibly through the processing anti-inflammatory cytokines and chemokines. Bacterium-induced periodontitis, especially in MMP8/− mice, is associated with systemic inflammatory and lipoprotein changes that are likely involved in early atherosclerosis.

SYNDECAN-1 AND TENASCIN EXPRESSION IN CYSTIC TUMORS OF THE PANCREAS.

KYLÄNPÄÄ LEENA, HAGSTRÖM JAANA, LEPISTÖ ANNA, LINJAMA TIINA, KÄRKKÄINEN PÄIVI, KIVILUOTO TUULA, HAGLUND CAJ

CONTEXT: Since benign and malignant mucin-producing tumors of the pancreas may be difficult to distinguish from each other; preoperative methods for differential diagnosis would reduce unnecessary surgery.

OBJECTIVE: To compare syndecan-1 and tenascin immunoexpression in benign and malignant cystic pancreatic tumors. DESIGN: We used immunohistochemical staining for syndecan-1 and tenascin antibodies in tumor tissue samples.

SETTING: Helsinki University Central Hospital.

PATIENTS: Tissue material came from 33 patients undergoing surgery from 1979 to 2005 for cystic pancreatic tumors.

RESULTS: A statistically significant difference appeared in syndecan-1 expression between benign (mucinous cystic neoplasms and intraductal papillary mucinous neoplasms) and mucinous carcinomas, but there was no significant difference in tenascin immunoexpression between these tumor groups.

CONCLUSION: Our findings suggest that low syndecan-1 expression might serve as a predictive factor for malignancy in cystic tumors of the pancreas.
AMOXICILLIN MAY CAUSE MOLAR INCISOR HYPOMINERALIZATION.

LAI SI S, ESS A, SAHLBERG C, ARVIO P, LU KINMAA PIRJO-LIISA, ALALUUSUA SATU

The etiology of molar incisor hypomineralization (MIH) is unclear. Our hypothesis was that certain antibiotics cause MIH. We examined 141 schoolchildren for MIH and, from their medical files, recorded the use of antibiotics under the age of 4 yrs. MIH was found in 16.3% of children. MIH was more common among those children who had taken, during the first year of life, amoxicillin (OR=2.06; 95% CI, 1.01-4.17) or the rarely prescribed erythromycin (OR=4.14; 95% CI, 1.05-16.4), compared with children who had not received treatment. Mouse E18 teeth were cultured for 10 days with/without amoxicillin at concentrations of 100 microg/mL-4 mg/mL. Amoxicillin increased enamel but not dentin thickness. An altered pattern of amelogenesis may have interfered with mineralization. We conclude that the early use of amoxicillin is among the causative factors of MIH.

HIGH JOB CONTROL ENHANCES VAGAL RECOVERY IN MEDIA WORK.

LINDHOLM HARRI, SINISALO JUHA, AHLBERG JARI, JAHKOLA ANTTI, PARTINEN MARKUS, HUBLIN CHRISTER, SAVOLAINEN ASLAK

BACKGROUND: Job strain has been linked to increased risk of cardiovascular diseases. In modern media work, time pressures, rapidly changing situations, computer work and irregular working hours are common. Heart rate variability (HRV) has been widely used to monitor sympathovagal balance. Autonomic imbalance may play an additive role in the development of cardiovascular diseases. AIMS: To study the effects of work demands and job control on the autonomic nervous system recovery among the media personnel. METHODS: From the cross-sectional postal survey of the employees in Finnish Broadcasting Company (n = 874), three age cohorts (n = 132) were randomly selected for an analysis of HRV in 24 h electrocardiography recordings. RESULTS: In the middle-aged group, those who experienced high job control had significantly better vagal recovery than those with low or moderate control (P < 0.01). Among young and ageing employees, job control did not associate with autonomic recovery. CONCLUSIONS: High job control over work rather than low demands seemed to enhance autonomic recovery in middle-aged media workers. This was independent of poor health habits such as smoking, physical inactivity or alcohol consumption.
NOVEL MAXILLARY RECONSTRUCTION WITH ECTOPIC BONE FORMATION BY GMP ADIPOSE STEM CELLS.

MESIMÄKI KARRI, LINDROOS B, TÖRNWALL JYRKI, MAUNO J, LINDQVIST CHRISTIAN, KONTIO R, MIETTINEN S, SUURONEN RIITTA

Microvascular reconstruction is the state-of-the-art in many fields of defect surgery today. Currently, reconstruction of large bony defects involves harvesting of autologous bone causing donor site morbidity and risk of infection. Specifically, utilizing autologous adipose stem cells (autoASCs), large quantities of cells can be retrieved for cell therapy applications and the risk of tissue rejection is diminished. The authors describe the first case report of a microvascular custom-made ectopic bone flap employing good manufacturing practice (GMP) level ASCs. The patient underwent a hemimaxillectomy due to a large keratocyst. After 36 months of follow-up, the defect was reconstructed with a microvascular flap using autoASCs, beta-tricalcium phosphate and bone morphogenetic protein-2. ASCs were isolated and expanded in clean room facilities according to GMP standards and were characterized in vitro. After 8 months of follow-up, the flap had developed mature bone structures and vasculature and was transplanted into the defect area. Postoperative healing has been uneventful, and further rehabilitation with dental implants has been started. The in vitro characterization demonstrated multipotentiality and mesenchymal stem cell characteristics in ASCs. This is the first clinical case where ectopic bone was produced using autoASCs in microvascular reconstruction surgery and it will pave way for new clinical trials in the field.

EFFECT OF AMINE FLUORIDE-STANNOUS FLUORIDE PREPARATIONS ON ORAL YEASTS IN THE ELDERLY: A RANDOMISED PLACEBO-CONTROLLED TRIAL.

MEURMAN JUKKA H, PÄRNÄNEN PIRJO, KARI KIRSTI, SAMARANAYAKE LAKSHAMAN

OBJECTIVES: Oral yeast infections are an emerging problem among medically compromised and frail elderly. Antifungal drug resistance is also increasing because of an increase in non-albicans Candida strains in these populations. We therefore set out to study, in the randomised-controlled trial setting if the use of a topical amine fluoride-stannous fluoride combination (AmF-SnF2) could control oral Candida growth in the elderly. The hypothesis was based on earlier findings showing that in vitro this combination had antifungal efficacy. METHODS: A total of 194 nursing home residents were randomised to receive either the test mouth rinse and toothpaste or a placebo twice daily for 8 months. Of these, 136 completed the trial. Saliva samples were taken using the oral rinse method, cultivated and the strain level identified with routine microbial
methods. Compliance and use of preparations was assessed by a nurse. RESULTS: Significantly at the end of the trial, less mucosal lesions were observed in the test group in comparison to controls. Total bacterial count decreased in both the groups during the trial. Candida albicans was the most prevalent strain detected both at baseline and 8 months later. Only a few subjects carried non-albicans strains. The AmF-SnF2 did not significantly affect mean oral Candida counts, but median Candida counts were reduced in the AmF-SnF2 group while an increase was seen in the placebo group. However, the differences observed were not statistically significant. Compliance among the regular elderly users slightly increased during the trial for both the groups. CONCLUSION: The number of subjects with high Candida counts decreased in the AmF-SnF2 group. Hence, the fluoride combination might be useful as a support therapy for oral candidiasis. Prevalence of non-albicans Candida strains was low in this population.

THE MENOPAUSE AND ORAL HEALTH.

MEURMAN JUKKA H, TARKKILA L, TIITINEN AILA

OBJECTIVES: To review the literature about oral symptoms and signs at the menopause with an emphasis on hormone replacement therapy (HRT). To give practical guidelines for women and their physicians in menopause-related oral health problems.

METHODS: The PubMed and Cochrane databases was searched until mid January 2009 with key words such as "menopause", "menopausal complaints", "postmenopausal complaints" and "oral diseases", "oral discomfort", "dental health", "dental diseases", "saliva", "burning mouth syndrome", "dry mouth", "xerostomia". Because of a scarcity of controlled studies no systematic review could be conducted.

RESULTS: Oral discomfort is found in many menopausal women in addition to more general climacteric complaints. The principal peri- and postmenopausal symptoms are dry mouth and burning mouth (glossodynia) which, in turn, may increase the occurrence of oral mucosal and dental diseases, such as candidiasis. The mechanisms of hormone-related oral symptoms and signs are not known although oestrogen receptors, for example, have been detected in the oral mucosa and salivary glands. In principle, the histology of oral and vaginal mucosa is very similar and thus their symptoms might share a common cause. Yet, hormone replacement therapy use does not necessarily prevent or help women with oral symptoms.

CONCLUSION: Properly controlled long-term randomized studies are needed to assess the effect of HRT on oral discomfort. Future gene profiling could identify women who may or may not benefit from HRT with regard to oral symptoms.
A CLUSTER RANDOMISED TRIAL OF EFFECTIVENESS OF EDUCATIONAL INTERVENTION IN PRIMARY HEALTH CARE ON EARLY CHILDHOOD CARIES.

MOHEBBI S. Z, VIRTANEN JORMA, VAHID-GOLPAYEGANI M, VEHKALAHTI MIIRA
Caries research. 43(2) : 110-118, 2009.

Early childhood caries (ECC) remains a serious problem in several developing and developed countries. This cluster randomised trial evaluated the impact of a 6-month educational intervention on ECC. The trial targeted 12- to 15-month-old children (n = 242) and their mothers in Tehran, Iran, visiting 18 public health centres, randomly selected and assigned to two intervention groups and one control group. At baseline, each mother was interviewed and each child underwent a dental examination of all teeth for the number of decayed teeth (dt) and of upper central incisors for the number of teeth with enamel caries (de). All mothers in the two intervention groups (A and B) received oral health instructions from the vaccination staff. In addition, group A received extra reminders. The outcome was defined as increments in the number of teeth with dt or de, as percentages of children developing new dt or de, and as the number needed to treat (NNT). No new de appeared in group A, the mean de increment in group B was 0.2 (SD = 0.6), and in the controls, it was 0.4 (SD = 0.7) (p < 0.05). The percentages of children developing new de were 0, 14, and 26%, respectively. No differences in dt increments were found. Regarding de, NNT for group A was 4 and for B 9; the figures for dt were 13 and 17, respectively. In conclusion, oral health education given to mothers by general health staff is a valuable tool to prevent caries in infants and toddlers. 2009 S. Karger AG, Basel.

DENTAL EDUCATION IN EUROPE.

MURTOPAA HEIKKI
European journal of dentistry . 3(1) : 1-2, 2009.

ACETALDEHYDE PRODUCTION FROM ETHANOL AND GLUCOSE BY NON-CANDIDA ALBICANS YEASTS IN VITRO.

NIEMINEN MIKKO T, UITTMAMO JOHANNA, SALASPURO MIKKO, RAUTEMAA RIINA

BACKGROUND: Major environmental risk factors for upper digestive tract cancers are tobacco smoking, alcohol intake and poor oral hygiene. They all result in increased acetaldehyde (ACH) levels in saliva which has been shown to be carcinogenic. During
alcohol challenge the oral microbiota is the main determinant of the local ACH concentration. Many bacteria and Candida albicans have been shown to be capable of ACH production. Moreover, chronic candidal mucositis can be carcinogenic. The ability of non-C. albicans Candida to produce ACH has not been studied. AIM: The aim of this study was to explore the ability of non-C. albicans Candida species to produce ACH in vitro during ethanol and glucose incubation. METHODS: A total of 30 non-C. albicans Candida isolates and one C. albicans reference strain were used. The cells were exposed to 11 mM of ethanol and to 100mM glucose in vitro. ACH was measured by gas chromatography. RESULTS: All Candida isolates produced significant amounts of ACH in ethanol incubation. C. tropicalis isolates were the highest (252.3 microM) and C. krusei isolates were the lowest (54.6 microM) producers of ACH from ethanol. Only C. glabrata produced significant amounts of ACH by fermentation from glucose. CONCLUSION: Colonization of oral mucosa with a non-C. albicans species such as C. glabrata, capable of producing carcinogenic amounts of ACH from both ethanol and glucose, may contribute to the development of oral cancer.

GENETIC BASIS OF TOOTH AGENESIS.

NIEMINEN PEKKA

Tooth agenesis or hypodontia, failure to develop all normally developing teeth, is one of the most common developmental anomalies in man. Common forms, including third molar agenesis and hypodontia of one or more of the incisors and premolars, constitute the great majority of cases. They typically affect those teeth that develop latest in each tooth class and these teeth are also most commonly affected in more severe and rare types of tooth agenesis. Specific vulnerability of the last developing teeth suggests that agenesis reflects quantitative defects during dental development. So far molecular genetics has revealed the genetic background of only rare forms of tooth agenesis. Mutations in MSX1, PAX9, AXIN2 and EDA have been identified in familial severe agenesis (oligodontia) and mutations in many other genes have been identified in syndromes in which tooth agenesis is a regular feature. Heterozygous loss of function mutations in many genes reduce the gene dose, whereas e.g. in hypohidrotic ectodermal dysplasia (EDA) the complete inactivation of the partially redundant signaling pathway reduces the signaling centers. Although these mechanisms involve quantitative disturbances, the phenotypes associated with mutations in different genes indicate that in addition to an overall reduction of odontogenic potential, tooth class-specific and more complex mechanisms are also involved. Although several of the genes so far identified in rare forms of tooth agenesis are being studied as candidate genes of common third molar agenesis and incisor and premolar hypodontia, it is plausible that novel genes that contribute to these phenotypes will also become identified. (c) 2009 Wiley-Liss, Inc.
HEAVY USE OF DENTAL SERVICES AMONG FINNISH CHILDREN AND ADOLESCENTS.

NIHTILÄ ANNAMARI, WIDSTRÖM E.
European archives of paediatric dentistry. 10 (1) : 7-12, 2009.

AIM: Our aim was to identify the heavy use of dental services among children and adolescents in the Public Dental Service (PDS) of one of the biggest cities in Finland, and compare oral health and treatments provided for heavy and low users. METHODS: All patients under 18 years of age having had 6 or more dental visits (n. 2,285) in 2004 and a comparison group of those having had 3 or fewer visits (n. 27,957) were selected from the patient register of the PDS of the city of Espoo. A sample of 245 patients was randomly selected from each group and information on age, sex, dental status, number and types of visits and treatments provided was collected from their treatment records. RESULTS: Seven percent of the children and adolescents who had visited the PDS in 2004 were heavy users according to the definition used. Their visits accounted for 26.3% of all dental visits of children and adolescents. The heavy users were classified as basic care heavy users and orthodontic heavy users. The mean treatment time for the basic care heavy users was 3 hours and 50 minutes, and for orthodontic heavy users 3 hours and 23 minutes; it was 40 minutes for the low users. Heavy users were on average 1.8 years older than low users. The basic care heavy users had more treated and untreated caries (mean DMFT/dmft = 4.0 and D/d = 2.4) than the low users (DMFT/dmft = 0.95 and D/d = 0.4). Of the low users, 43.6% had a healthy periodontium (CPI = 0) compared with 27.4% of the basic care heavy users and with 30.8% of the orthodontic heavy users. The most frequently provided treatments for heavy users were orthodontic care and fillings by dentists and for low users preventive measures and examinations. Most of the heavy users (66.4%) received less complicated orthodontic treatment given by a dentist compared with only 7.9% of the low users. Despite the low users' significantly better oral status compared with basic care heavy users there were only minor differences in the type of preventive measures provided for the two groups. The orthodontic heavy users received fewer preventive measures than low users. CONCLUSION: Our study revealed two main reasons for heavy use of dental services: high numbers of orthodontic treatments provided by dentists and high numbers of decayed teeth in a small number of children. To increase productivity, orthodontic care should be provided more efficiently and preventive care needs to be targeted more carefully.
MOLECULAR AND CLINICAL ANALYSES OF THE GENE ENCODING THE COLLAGEN-BINDING ADHESIN OF STREPTOCOCCUS MUTANS.

NOMURA ROYTA, NAKANO KAZUHIKO, TANIGUCHI NAHO, LAPIRATTANAKUL JINTHANA, NEMOTO HIROTOSHI, GRÖNROOS LISA, ALALUUSUA SATU, OOSHIMA TAKASHI

Streptococcus mutans is a known pathogen of dental caries and its major cell surface antigens have been widely investigated. Recently, an approximately 120 kDa Cnm protein with binding properties to type I collagen was identified, and its encoding gene (cnm) cloned and sequenced. In the present study, we sequenced cnm from 47 different clinical S. mutans strains and found that the nucleotide alignment of the collagen-binding domain was well conserved. We devised a PCR method for identifying the cnm gene, examined the prevalence of cnm-positive S. mutans strains in various mother-child groups, and assessed the significance of such strains for transmission and dental caries. The detection rate of cnm-positive strains was significantly lower in strains isolated from Japanese children in the 2000s (8.0 %) as compared to those isolated in the 1980s (15.8 %) (P<0.05). Furthermore, the presence of S. mutans possessing cnm in salivary specimens collected from 55 S. mutans-positive mother-child pairs was 40 and 32.7 % in the mothers and children, respectively. The frequency of cnm-positive children whose mothers were also positive was 72 %, which was significantly higher than that of cnm-positive children with negative mothers (P<0.0001, odds ratio 17.5). In addition, clinical parameters indicating dental caries were significantly increased in children with cnm-positive S. mutans in saliva (n=13), as compared to those with cnm-negative S. mutans (n=15) and S. mutans-negative children (n=20) (P<0.01). These results indicate that cnm-positive S. mutans strains are closely correlated with dental caries, while vertical transmission in cnm-positive mother-child pairs was also demonstrated.

SERUM LIPOPOLYSACCHARIDE ACTIVITY IS ASSOCIATED WITH THE PROGRESSION OF KIDNEY DISEASE IN FINNISH PATIENTS WITH TYPE 1 DIABETES.

NYMARK MARIANN, PUSSINEN PIRKKO, TUOMAINEN ANITA, FORSBLOM CAROL, GROOP PER-HENRIK, LEHTO MARKKU; FINNDIANE STUDY GROUP

OBJECTIVE: The aim of the study was to investigate whether serum lipopolysaccharide (LPS) activities are associated with the progression of kidney disease in patients with type 1 diabetes.
RESEARCH DESIGN AND METHODS: For this prospective study, we chose 477 Finnish patients with type 1 diabetes, who were followed for 6 years. At the baseline visit, 239 patients had a normal albumin excretion rate (normoalbuminuria) and 238
patients had macroalbuminuria. Patients were further divided into nonprogressors and progressors based on their albumin excretion rate at follow-up. Eighty normoalbuminuric patients had developed microalbuminuria, and 79 macroalbuminuric patients had progressed to end-stage renal disease. Serum LPS activity was determined with the Limulus amoebocyte lysate chromogenic end point assay.

RESULTS: Serum LPS activity was significantly higher in the macroalbuminuric group than in the normoalbuminuric group (P < 0.001). Notably, normoalbuminuric progressor patients had a significantly higher LPS activity at baseline than normoalbuminuric nonprogressor patients (median 49 [interquartile range 34-87] vs. 39 [29-54] EU/ml; P = 0.001). The normoalbuminuric progressor patients exhibited features of the metabolic syndrome with higher triglyceride concentrations and lower estimated glucose disposal rate. A high LPS-to-HDL ratio was associated with the progression of kidney disease in both groups. Insulin resistance (P < 0.001) and serum LPS activity (P = 0.026) were independent risk factors of disease development, when A1C was removed from the regression analysis.

CONCLUSIONS: High serum LPS activity is associated with the development of diabetic nephropathy in Finnish patients with type 1 diabetes.

EFFECTS OF INHALED CORTICOSTEROIDS ON METALLOPROTEINASE-8 AND TISSUE INHIBITOR OF METALLOPROTEINASE-1 IN THE AIRWAYS OF ASTHMATIC CHILDREN.

OBASE Y, RYTLÄ P, METSO T, PELKONEN A. S, TERVAHARTIALA TAINA, TURPEINEN M, MÄKELÄ M, SAARIALHO-KERE U, SELROOS O, SORSA TIMO, HAAHTELA TARI


BACKGROUND: The effects of corticosteroids on the level and expression of matrix metalloproteinase-8 (MMP-8; collagenase-2) and tissue inhibitors of metalloproteinases (TIMPs) in airway tissue are poorly characterized in vivo. METHODS: We compared MMP-8 and TIMP-1 levels in induced sputum and their expression in airway inflammatory cells of healthy children (n = 27) and of children with newly diagnosed asthma with mild (n = 20) or moderate symptoms (n = 19), before and after 6 months of treatment with inhaled budesonide. RESULTS: At baseline, MMP-8 was higher in asthmatic children with moderate symptoms, TIMP-1 was lower and the MMP-8/TIMP-1 ratio was higher in both groups of asthmatic children compared with controls. Inhaled budesonide increased TIMP-1 levels in both groups of asthmatic children and normalized the MMP-8/TIMP-1 ratio, and this paralleled the improvement in forced expiratory volume in 1 s in children with mild symptoms. At baseline, asthmatic children had significantly more MMP-8-positive macrophages than control children, whereas the number of TIMP-1-positive macrophages was almost the same. Budesonide decreased the percentage of MMP-8-positive macrophages and increased that of TIMP-1-positive macrophages; these changes were significant in asthmatic children with mild symptoms. CONCLUSIONS: Inhaled budesonide normalized the MMP-8/TIMP-1 ratio in asthmatic children by
upregulation of TIMP-1 production and downregulation of MMP-8 production by airway macrophages. This change may be a biochemical marker of an effect on airway inflammation and possibly of an ongoing remodeling process that should be further investigated using biopsy specimens.

PRO-ATHEROGENIC LUNG AND ORAL PATHOGENS INDUCE AN INFLAMMATORY RESPONSE IN HUMAN AND MOUSE MAST CELLS.

OKSAHARJU ANNA, LAPPALAINEN JANI, TUOMAINEN ANITA, PUSSINEN PIRKKO, PUOLAKKAINEN MIRJA, KOVANEN PETRI, LINDSTEDT KEN

A broad variety of microbes are present in atherosclerotic plaques and chronic bacterial infection increases the risk of atherosclerosis by mechanisms that have remained vague. One possible mechanism is that bacteria or bacterial products activate plaque mast cells that are known to participate in the pathogenesis of atherosclerosis. Here, we show by real-time PCR analysis and ELISA that Chlamydia pneumoniae (Cpn) and a periodontal pathogen, Aggregatibacter actinomycetemcomitans (Aa), both induce a time and concentration-dependent expression and secretion of interleukin 8 (IL-8), tumour necrosis factor-alpha (TNF-alpha) and monocyte chemoattractant protein-1 (MCP-1) by cultured human peripheral blood-derived mast cells, but not anti-inflammatory molecules, such as IL-10 or transforming growth factor beta 1 (TGF-beta 1). The IL-8 and MCP-1 responses were immediate, whereas the onset of TNF-alpha secretion was delayed. The Cpn-mediated pro-inflammatory effect was attenuated when the bacteria were inactivated by UV-treatment. Human monocyte-derived macrophages that were pre-infected with Cpn also induced a significant pro-inflammatory response in human mast cells, both in cocultures and when preconditioned media from Cpn-infected macrophages were used. Intranasal and intravenous administration of live Cpn and Aa, respectively induced an accumulation of activated mast cells in the aortic sinus of apolipoprotein E-deficient mice, however, with varying responses in the systemic levels of lipopolysaccharide (LPS) and TNF-alpha. Pro-atherogenic Cpn and Aa induce a pro-inflammatory response in cultured human connective tissue-type mast cells and activation of mouse aortic mast cells in vivo.

DETECTION OF MULTIPLE PATHOGENIC SPECIES IN SALIVA IS ASSOCIATED WITH PERIODONTAL INFECTION IN ADULTS.

PAJU SUSANNA, PUSSINEN PIRKKO, SUOMINEN-TAIPALE LIISA, HYVÖNEN MARI, KNUUTTILA MATTI, KÖNÖNEN EIJA

We investigated whether certain bacterial species and their combinations in saliva can be used as markers for periodontitis. In 1,198 subjects, the detection of multiple species,
rather than the presence of a certain pathogen, in saliva was associated with periodontitis as determined by the number of teeth with deepened periodontal pockets.

FINNISH DENTISTS' PERCEPTIONS OF THE LONGEVITY OF DIRECT DENTAL RESTORATIONS.

PALOTIE ULLA, VEHKALAHTI MIIRA

OBJECTIVES: To evaluate Finnish dentists' perceptions of the longevity of direct dental restorations; to assess the possible impacts of dentists' characteristics on these perceptions; and to compare the present longevity estimates with those of recent European reports.

METHODS: A questionnaire to 592 general practitioners, systematically sampled from the Finnish Dental Association's membership list, was posted in April 2004 and data collection was finished by the end of June. The question "In general, what is your estimate for the mean age of restoration in permanent teeth?" pointed restorations: Class II and MOD composites and amalgam in a posterior tooth and Class III composites in an incisor. Dentists' gender, main work, and year of graduation served as background information. Of the 339 (57%) respondents, only public and private dentists were included; 11 were excluded. Three studies fulfilled the inclusion criteria for recent reports on restoration longevity. Statistical evaluation was by one-way ANOVA, with p=0.05 as the level of significance.

RESULTS: The mean of the estimates for all types of composite was 9.0 years (SD 3.6; 95% CI 8.6-9.3) and 18.7 years for amalgam (SD 7.3; 95% CI 18.0-19.5). Male dentists gave longer estimates than female dentists for posterior composites, but shorter estimates for amalgam. Compared to public dentists, private dentists gave longer estimates for posterior composites. All estimates were longer than those reported in the recent literature.

CONCLUSION: Dentists' perceptions of posterior composite longevity are significantly longer among males than among females and among private than public sector dentists, and exceed the median longevity reported in recent studies.

LAMININ-511 AND FIBRONECTIN DEGRADATION WITH CANDIDA YEAST.

PÄRNÄNEN PIRJO, MEURMAN JUKKA H, VIRTANEN ISMO

BACKGROUND: The invasion mechanism of Candida yeast is still partly unknown. In this study, we tested the ability of different commensal Candida yeast to degrade two basement membrane and extracellular matrix proteins: laminin-511 (Lm-511) and plasma fibronectin. METHODS: Human Lm-511 was produced by an immortal keratinocyte cell line, labelled with (35)S-methionine and immunoprecipitated from the growth medium
with monoclonal antibodies. Human plasma fibronectin was purified from plasma samples of blood donors. Sonicated yeast cells and concentrated yeast cell growth media were incubated with Lm-511 in different pH values and the degradation was detected by fluorography. Fibronectin degradation by yeast was visualized by sodium dodecyl-sulphate polyacrylamide gel electrophoresis. RESULTS: The reduced 220 kDa fibronectin monomers were found to be degraded at pH 7.8 by 10x concentrated growth media of most strains tested and at pH 3.0 the degradation was more pronounced. Sonicated cell fractions of C. tropicalis and C. parapsilosis caused degradation of plasma fibronectin at pH 7.8. Instead, none of the tested Candida cell fractions degraded Lm-511 under these conditions. CONCLUSIONS: It seems that cleavage of different laminin isoforms by Candida yeast is a laminin-specific process. The ability to cleave human plasma fibronectin is species- and pH-dependent but not hyphal-dependent and also this degradation may affect epithelial integrity.

CLINICAL AND MICROSTRUCTURAL ABERRATIONS OF ENAMEL OF DECIDUOUS AND PERMANENT TEETH IN PATIENTS WITH AUTOIMMUNE POLYENDOCRINOPATHY-CANDIDIASIS-ECTODERMAL DYSTROPHY.

PAVLIC ALENKA, WALTIMO-SIRÉN JANNA

OBJECTIVE: Autoimmune polyendocrinopathy-candidiasis-ectodermal dystrophy (APECED) causes multiple endocrine deficiencies, oral candidiasis and different forms of ectodermal dystrophy including enamel hypoplasia, documented in permanent teeth. Our purpose was to examine dental aberrations associated with APECED, including possible manifestations in primary teeth. DESIGN: We studied clinically, radiographically, and by scanning electron microscopy (SEM) teeth of children belonging to two APECED families with different mutations in the AIRE gene. RESULTS: In addition to enamel defects in the permanent teeth we observed hypoplastic pits and hypomaturated patches in the deciduous teeth with underlying changes in the prismatic ultrastructure. The enamel of the permanent molars exhibited a layered arrangement with included whirl-like formations. CONCLUSIONS: Our findings confirm that APECED causes enamel defects that are individually but chronologically distributed, and can alter enamel development early enough to affect deciduous teeth.
CLINICAL AND MICROSTRUCTURAL ABERRATIONS OF ENAMEL OF DECIDUOUS AND PERMANENT TEETH IN PATIENTS WITH AUTOIMMUNE POLYENDOCRINOPATHY-CANDIDIASIS-ECTODERMAL DYSTROPHY.

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INFECTIONS AS A STIMULUS FOR CORONARY OCCLUSION, OBSTRUCTION, OR ACUTE CORONARY SYNDROMES.

PESONEN ERKKI, EL-SEGAIER MILAD, PERRSON KENNETH, PUOLAKKAINEN MIRJA, SARNA SEPO, ÖHLIN HANS, PUSSINEN PIRKKO

BACKGROUND: Atherosclerosis is considered to be an inflammatory disease. Infections are a significant cause of inflammation. Acute infections might precipitate acute coronary syndromes (ACS) whereas chronic infections might be stimuli for the development of atherosclerosis. METHODS: Coronary angiograms were done on 211 of 335 patients with ACS and the percentage of coronary obstruction was determined. Serum antibody levels to Chlamydia pneumoniae, C. pneumoniae heat shock protein 60 (CpnHSP60), human heat shock protein 60 (hHSP60), enterovirus (EV), herpes simplex virus (HSV), cytomegalovirus (CMV), and two major periodontal pathogens, Aggregatibacter actinomycetemcomitans and Porphyromonas gingivalis, were measured in healthy controls (n = 355) and all patients. RESULTS: Serum antibody levels to periodontal pathogens did not correlate with ACS. However, IgA-class antibody levels to Aggregatibacter actinomycetemcomitans (p = 0.021), CpnHSP60 (p = 0.048) an hHSP60 (p = 0.038) were higher in patients with coronary occlusion or obstruction compared to those without any obstruction. Odds ratios for coronary changes in the highest quartile as compared to the lower quartiles were for A. actinomycetemcomitans IgA 7.84 (95% CI 1.02-60.39, p = 60}
0.048), for CpnHSP60 IgA 8.61 (1.12-65.89, p = 0.038), and for human HSP60 IgA 3.51 (0.79-15.69, p = 0.100). CONCLUSIONS: We have previously reported that EV and HSV titres correlated significantly to acute coronary events. They do not correlate to the degree of coronary obstruction as shown here. However, infection by A. actinomycetemcomitans or C. pneumoniae or host response against them associated with coronary obstruction. Clinical coronary events may arise by the effect of acute infections and obstructing lesions by a chronic inflammatory stimulus.

MMP-13 PROMOTER POLYMORPHISMS IN PATIENTS WITH CHRONIC PERIODONTITIS : EFFECTS ON GCF MMP-13 LEVELS AND OUTCOME OF PERIODONTAL THERAPY.

PIRHAN D, ATILLA G, EMINGIL GÜLNUR, TERVAHARTIALA TAINA, SORSA TIMO, BERDELI A.


AIM: The aims of this study were to investigate (a) the matrix metalloproteinase-13 (MMP-13) promoter polymorphisms in severe, generalized chronic periodontitis (CP), (b) the relationship of periodontal therapy outcome with these genotypes and (c) gingival crevicular fluid (GCF) MMP-13 level-MMP-13 genotype correlation. MATERIALS AND METHODS: Genomic DNA was obtained from peripheral blood of 102 patients with severe, generalized CP, and 98 periodontally healthy subjects. MMP-13 -77A/G and 11A/12A polymorphisms were determined by the polymerase chain reaction-restriction fragment length polymorphism and DNA sequencing methods, respectively. Fifty-eight CP patients received non-surgical periodontal therapy and were followed for 6 months. Clinical periodontal parameters and GCF samples were collected at baseline and at 6 months. GCF MMP-13 levels were analysed by an enzyme-linked immunosorbent assay. RESULTS: The distribution of MMP-13 -77AG genotypes and allele frequencies did not differ significantly between study groups (p>0.05). Study subjects, except 3, had the 11A/11A genotype. MMP-13 -77G allele carriers had similar GCF MMP-13 levels and clinical periodontal parameters compared with AA genotypes after non-surgical periodontal therapy (p<0.05). CONCLUSIONS: These data suggest that the -77A/G and 11A/12A polymorphisms of MMP-13 gene are not associated with susceptibility to severe, generalized CP in a Turkish population. It seems that -77G allele carriage may not influence the outcome of periodontal therapy.
FACTORS AFFECTING MATRIX METALLOPROTEINASE-8 LEVELS IN THE VAGINAL AND CERVICAL FLUIDS IN THE FIRST AND SECOND TRIMESTER OF PREGNANCY.

RAHKONEN LEENA, RUTANEN Eeva-Marja, UNKILA-KALLIO LEILA, NUUTILA MIKA, NIEMINEN PEKKA, SORSA TIMO, PAAVONEN JORMA


BACKGROUND: Cervical ripening during pregnancy resembles an inflammatory process. Matrix metalloproteinases (MMPs), particularly MMP-8, have been linked to inflammatory processes. We studied the concentrations of, and factors associated with, MMP-8 in the lower genital tract fluids in the first and second trimesters. METHODS: In a prospective population-based cohort study, vaginal and cervical swab samples were obtained from 2130 unselected pregnant women undergoing their first and second trimester ultrasound screening. MMP-8 was determined by immunofluorometric assay. Use of antibiotics, history of vaginal bleeding, and history of sexual intercourse were recorded on both occasions. Vaginal smears were obtained for Gram-staining and leukocyte counting. Cervical length was measured by ultrasonography. The main outcome measures were MMP-8 concentrations in the vagina and cervix. RESULTS: The median (range) MMP-8 concentrations in vaginal and cervical samples were 107.4 microg/l (undetectable-2406.6 microg/l) and 318.3 microg/l (0.1-2074.6 microg/l), respectively, in the first trimester, and 112.5 microg/l (undetectable-2093.4 microg/l) and 344.8 microg/l (0.4-1783.5 microg/l), respectively, in the second trimester. Multiparity and vaginal leukocytosis were both associated with increased MMP-8 concentrations in vaginal and cervical samples in both trimesters. Bacterial vaginosis (BV) was associated with increased vaginal and cervical MMP-8 in the first trimester, but only with increased vaginal MMP-8 in the second trimester. A history of sexual intercourse (in the previous 48 h) was associated with lower MMP-8 concentrations in cervical samples in both trimesters. CONCLUSIONS: MMP-8 concentrations were lower in vaginal samples than in cervical samples, and no difference was found between the first and second trimesters. Multiparity, BV and an elevated leukocyte count in the vagina were associated with increased MMP-8 concentrations. Sexual intercourse had an opposite effect. The study suggests that MMP-8 is a physiologic constituent in lower genital tract fluids, where it may be involved in host response to inflammatory and infectious processes.
ENHANCED SYSTEMIC MATRIX METALLOPROTEINASE RESPONSE IN HELICOBACTER PYLORI GASTRITIS.

RAUTELIN HILPI, OKSANEN AINO M, VEIJOLA LEA I, SIPPONEN PENTTI I, TERVAHARTIALA TAINA, SORSA TIMO, LAUHIO ANNELI

BACKGROUND: Helicobacter pylori causes chronic gastritis, peptic ulcer disease, and is the most important risk factor for non-cardia gastric cancer, and has been shown to upregulate matrix metalloproteinases (MMPs) in infected gastric mucosa. MMPs are proteolytic enzymes regulated by tissue inhibitors of metalloproteinases (TIMPs). AIMS: We set up this study to find out whether H. pylori gastritis induces systemic MMP response. METHODS: Serum samples were collected from patients undergoing gastroscopy; 26 patients had H. pylori gastritis and 18 were H. pylori-negative controls with normal gastric mucosa. Serum MMP levels were analysed by enzyme-linked immunosorbent assay. RESULTS: Significantly elevated serum levels of collagenase-2 (MMP-8), gelatinase B (MMP-9), neutrophil elastase (NE), and myeloperoxidase (MPO), and reduced serum levels of gelatinase A (MMP-2) and TIMP-1 were demonstrated in patients with H. pylori gastritis as compared to H. pylori-negative controls. No significant differences were shown in serum matrilysin-1 (MMP-7) levels. CONCLUSIONS: For the first time, we show enhanced MMP-8 response in H. pylori infection together with other neutrophil degranulation products (MMP-9, MPO, NE). Elevated circulating neutrophil degranulation product levels in serum of H. pylori-positive patients reflect accelerated proteolysis and oxidative stress, and may contribute to extraintestinal sequelae, such as cardiovascular diseases.

HOW THE HOST FIGHTS AGAINST CANDIDA INFECTIONS.

RICHARDSON MALCOLM, RAUTEMAA RIINA

Candida albicans is the predominant cause of both superficial and invasive forms of candidosis, although the proportion of serious infections attributed to other members of the genus is rising. The spectrum of host defences include cell mediated immunity which is comprised of cytokine release by lymphocytes and activation of natural killer cells and lymphocytes by interleukins. An increasing body of evidence supports a role for specific antibody in protection against invasive Candida infection. Clinical observations indicate that mucocutaneous Candida infections are commonly associated with defective cell-mediated immune responses. Innate immunity is the dominant protective mechanism against disseminated candidosis. Quantitative and qualitative abnormalities of neutrophils and monocytes are associated with systemic candidosis. In the present review virulence factors and the spectrum of immune responses are discussed in relation to the perspective for the development of appropriate vaccines against Candida. Here we present an overview of toll-like receptor signalling, cellular-dependent responses, the role of specific
antibodies in protection against Candida, and the array of immune mechanisms that operate in gastrointestinal, vaginal and oral candidosis.

"STRAWBERRY LIKE" GINGIVITIS BEING THE FIRST SIGN OF WEGENER'S GRANULOMATOSIS.

RUOKONEN HELLEVI, HELVE TAPANI, AROLA JOHANNA, HIETANEN JARKKO, LINQVIST CHRISTIAN, HAGSTROM JAANA

Wegener's granulomatosis (WG) is a rare granulomatous necrotizing vasculitis of small vessels, affecting vascular structures having predilection for upper airways. If untreated WG can be lethal. WG is also known to cause oral mucosal lesions. We report a case of WG that was first diagnosed on oral gingival mucosa. A 51-year old woman was referred to a specialized dentist because of consistent irritative buccal gingival hyperplasia that did not react to conservative and microbial treatment. The lesion was biopsied and the diagnosis was suggestive for WG. Patient was further referred to the Department of Rheumatology and the diagnose of WG was confirmed and treated. The oral lesions cured totally. This case emphasizes the importance to recognize the oral manifestation of WG to get proper medication as soon as possible and avoid serious systemic tissue damage.

A NOVEL METHOD FOR SAMPLING THE MICROBIOTA FROM THE ORAL MUCOSA.

RUSANEN PETER, SIKALA EMILIA, UITTAMO JOHANNA, RICHARDSON MALCOLM, RAUTEMAA RIINA

The purpose of this study was to develop a site-specific sampling method that could give representative and quantitative results for defined areas of the oral mucosa and would be easy to use. Two site-specific sampling methods (swab and filter paper imprint) were compared. The filter paper sampling method was developed for this study. Samples were collected from 14 volunteers. All samples were cultured under aerobic and anaerobic conditions. The number of viable bacteria and yeasts was determined and expressed per unit area. The filter paper recovered a significantly higher number of colony types of bacteria compared to the swab sample. Both collected a large number and variety of different oral microbes. The filter paper sampling method could be the optimal technique for quantitative site-specific oral mucosal samples and is highly suitable for both culture-based and non-culture-based identification of oral microbes.
SCHOOL-BASED INTERVENTION TO PROMOTE PREADOLESCENTS' GINGIVAL HEALTH: A COMMUNITY TRIAL.

SAIED-MOALLEMI Z, VIRTANEN JORMA, VEHKALAHTI MIIRA, TEHRANCHI A, MURTOMAA HEIKKI

OBJECTIVES: Evaluation of the effectiveness of a school-based oral health promotion intervention on preadolescents' gingival health.

METHODS: A community trial designed for a 3-month intervention study in a representative sample of 9-year-olds (n = 457) in 16 schools in Tehran, Iran. The schools were randomly assigned to three intervention groups and one control group, each group comprising two boys' and two girls' schools. The first group of children (n = 115) received intervention via class work, solving a set of puzzles containing oral health messages, under supervision of their health counsellor. The second group (n = 114), intervention via parents, included an oral health education leaflet and a brushing diary for supervising the child's tooth-brushing; the third group (n = 111) received a combination of both these interventions. The control group (n = 117) had no intervention. Effects of the intervention were assessed as changes in dental plaque and gingival bleeding. Improvements in gingival health were recorded when half of the index teeth with plaque at baseline became clean (acceptable oral hygiene) or when all index teeth with bleeding at baseline became healthy (healthy gingiva). Statistical analysis included chi square, anova, t-test, Number Needed to Treat (NNT) and generalized estimating equations (GEE).

RESULTS: At baseline, none of the children were free of plaque and all except for three boys had bleeding. After the trial, acceptable oral hygiene was more frequent in the parental-aid (P < 0.001) and the combined groups (P < 0.05), and healthy gingiva in both groups (P < 0.001) in comparison with the control group. Outcomes in the class-work group did not differ from those in the control group. The GEE models confirmed a strong intervention effect on healthy gingiva in both groups where parents were involved: parental-aid group (OR = 7.7, 95% CI: 2.2–27.7) and combined group (OR = 6.6, 95% CI: 2.0–22.1). In all intervention groups more girls than boys achieved healthy gingiva (OR = 2.5–2.6). Parents' education showed no impact on the outcome.

CONCLUSIONS: When a school-based oral health intervention involves parents it may result in a significant improvement in the gingival health of preadolescents with poor gingival health at baseline.
CHARACTERISTICS OF DENTAL ATTENDANCE AMONG LITHUANIAN MIDDLE-AGED UNIVERSITY EMPLOYEES.

SAKALAUSKIENE ZANA, MACIULSKIEIENE VITA, VEHKALAHTI MIIRA, KUBILIUS RICARDAS, MURTOMAA HEIKKI

OBJECTIVE: This study aimed to evaluate and describe the dental attendance patterns and to characterize the factors that encourage preventive dental visits among 35- to 44-year-old university employees in Lithuania. MATERIAL AND METHODS: A questionnaire survey was conducted anonymously among the 35- to 44-year-old employees (n=862) of four universities in Lithuania in 2005. The response rate was 64% (n=553). Data on their most recent dental visit, habitual dental attendance, and self-reported dental health were collected. Gender, marital status, education, and income levels served as background factors. Of the respondents, 79% were women, and 82% held a university degree. RESULTS: Of all the respondents, 75% reported having their most recent dental visit within the previous 12 months; 19% indicated a preventive check-up as the reason for it (15%--self-decided visit and 4%--dentist's recall). The most common treatments received were fillings (75%), scaling and cleaning (28%), and endodontic treatment (22%). Analysis of the data about habitual dental attendance showed that preventive check-up as the main reason for attendance was more commonly reported by women (OR=1.7), among those who indicated having lost fewer teeth (OR=1.5), reported higher incomes (OR=1.4), and who indicated a shorter time interval since their most recent dental visit (OR=1.3). CONCLUSION: Dental problem seems to be a dominant reason for dental attendance in Lithuania where both dentists' and patients' behavior weakly reflects preventive orientation.

DETERMINATION OF MATRIX METALLOPROTEINASES IN HUMAN RADICULAR DENTIN.

SANTOS JULIANA, CARRILHO MARCELA, TERVAHARTIALA TAINA, SORSA TIMO, BRESCHI LORENZO, MAZZONI ANNALISA, PASHLEY DAVID, TAY FRANKLIN, FERRAZ CAIO, TJÄDERHANE LEO

Matrix metalloproteinases (MMPs) are present in sound coronal dentin and may play a role in collagen network degradation in bonded restorations. We investigated whether these enzymes can also be detected in root dentin. Crown and root sections of human teeth were powderized, and dentin proteins were extracted by using guanidine-HCl and EDTA. Extracts were analyzed by zymography and Western blotting for matrix metalloproteinases detection. Zymography revealed gelatinolytic activities in both crown and root dentin samples, corresponding to MMP-2 and MMP-9. MMP-2 was more evident in demineralized root dentin matrix, whereas MMP-9 was mostly extracted from
the mineralized compartment of dentin and presented overall lower levels. Western blot analysis detected MMP-8 equally distributed in crown and root dentin. Because MMPs are also present in radicular dentin, their contribution to the degradation of resin-dentin bonds should be addressed in the development of restorative strategies for the root substrate.

**SURVIVAL AFTER LIP CANCER DIAGNOSIS.**

SARGERAN KATAYOUN, MURTOMAA HEIKKI, SAFAVI SEYED MOHAMMAD, VEHKALAHTI MIIRA, TERONEN OLLI


The purpose of this study was to analyze the 5-year survival rates of 82 patients with lip cancer attending 5 university hospitals during 1999-2003 in Tehran, Iran. We used information from patient records, telephone calls, and death register files of the Iran Ministry of Health to ascertain the patients' vital status. Associations between survival and the variables of sex, age, stage of the tumor at the time of diagnosis, treatment modality, and tumor histopathologic type were analyzed with Kaplan-Meier, log-rank, and Cox regression methods. Of all patients, 70 (85%) were men, with a median age of 62 years (mean, 58.6 years [SD, 15 years]; range, 27-85 years) at the time of diagnosis. The median follow-up time of the patients was 57 months (mean, 56.4 months [SD, 28 months]; range, 0-112 months). The 1- to 5-year overall survival rate was 91% to 62%. The tumor stage at the time of diagnosis and the treatment modality were associated with survival (P < 0.05) in both univariate and multivariable analyses. Patients who underwent surgery and had lower stage tumors at the time of diagnosis showed higher survival rates. No differences in patient survival were found regarding sex, age, and histopathologic type of tumors. These findings indicate that although lip tumors are curable, early detection, diagnosis, and treatment lead to even higher rates of survival. Importance of the early detection of lip cancer should be emphasized in all health care and cancer prevention campaigns directed to the public and professionals.

**DELAYED DIAGNOSIS OF ORAL CANCER IN IRAN: CHALLENGE FOR PREVENTION.**

SARGERAN KATAYOUN, MURTOMAA HEIKKI, SAFAVI SEYED MOHAMMAD, TERONEN OLLI


PURPOSE: The aim of this study was to investigate the diagnostic delay and its determinants among oral cancer patients in Tehran, Iran.

MATERIALS AND METHODS: This study was conducted between September 2004 and September 2006 in three university hospitals, and included 100 consecutive patients with primary oral squamous cell carcinoma (international classification of disease, ICD-
Data were obtained through questionnaire interviews and medical records of the patients were reviewed to obtain information on the date of diagnosis, primary tumour site and the stage of the tumour at the time of diagnosis. Statistical analysis was performed by t test, ANOVA and logistic regression.

RESULTS: The mean diagnostic delay was 7.2 months (SD 7.5, range 1 to 36 and median 4). The most important determinants of longer diagnostic delay were being single (OR = 4.8; 95% CI = 1.5 to 14.8; P < 0.05) and being at advanced tumour stages (OR = 5.3; 95% CI = 1.8 to 15.6; P < 0.01). The mean patient and professional delays were 5.3 months (SD 6.1 and median 2) and 2.1 months (SD 2.1 and median 1), respectively. Patients at advanced tumour stages were more likely to have longer patient and professional delays than those at early stages (OR = 5.6; 95% CI = 1.8 to 17.3 and OR = 3.4; 95% CI = 1.2 to 9.4, respectively; P < 0.05). Living alone was also a determinant of longer patient and professional delays (OR = 7.1; 95% CI = 2.0 to 24.7, OR = 3.5; 95% CI = 1.2 to 10.3, respectively; P < 0.05).

CONCLUSIONS: Developing preventive programmes that focus on the enhancement of public and professional awareness about oral cancer is essential to promote earlier diagnosis in Iran.

MATRIX METALLOPROTEINASE-9 AND TISSUE INHIBITOR OF MATRIX METALLOPROTEINASE-1 IN BLOOD AS MARKERS FOR EARLY ATHEROSCLEROSIS IN SUBJECTS WITH CHRONIC PERIODONTITIS.


BACKGROUND AND OBJECTIVE: An association has been found between periodontal disease and the development of atherosclerosis. We investigated the hypothesis that periodontal disease triggers the expression of matrix metalloproteinase-9 (MMP-9) and tissue inhibitor of matrix metalloproteinase-1 (TIMP-1) in blood. Increased levels of these parameters might then indicate early atherosclerosis. MATERIAL AND METHODS: In this cross-sectional study, the material comprised 80 subjects with chronic periodontitis and 31 subjects with no periodontal disease. Sixteen years after diagnosis of periodontal disease ultrasonography revealed a statistically significant difference (p < 0.001) of carotid intima-media thickness between the subjects with chronic periodontitis and the periodontally healthy subjects. Matrix metalloproteinase-9 and TIMP-1 were analyzed from blood as periodontal and systemic inflammatory markers. The relationship between MMP-9, TIMP-1 and MMP-9/TIMP-1 as dependent variables and several independent variables (age, sex, smoking, education, body mass index, hypertension, periodontal disease and cholesterol) were analyzed in multiple logistic regression models to assess the value of the inflammatory markers in predicting carotid atherosclerosis. RESULTS: Matrix metalloproteinase-9 and TIMP-1 were significantly higher in plasma from subjects with periodontal disease and atherosclerosis. Periodontal disease was identified as the principal independent predictor both for atherosclerosis (odds ratio 3.89 for increase in bilateral carotid intima-media thickness)
and for increased MMP-9, TIMP-1 and MMP-9/TIMP-1 (odds ratio 2.58, 5.53 and 3.41, respectively). Classical atherosclerosis risk factors, such as increased total cholesterol, age and sex (women), were significant predictors in the model. CONCLUSION: Matrix metalloproteinase-9, TIMP-1 and MMP-9/TIMP-1 in blood from subjects with periodontal disease could be useful laboratory markers for increased carotid artery intima-media thickness.

ASSOCIATION OF SENSE OF COHERENCE AND CLINICAL SIGNS OF TEMPOROMANDIBULAR DISORDERS.

SIPILÄ KIRSI, YLÖSTALO PEKKA, KÖNÖNEN MAUNO, UUTELA ANTTI, KNUUTTILA M.

AIMS: To investigate the association of sense of coherence (SOC) with clinical findings of temporomandibular disorders (TMD) among 30- to 64-year-old subjects. METHODS: A nationally representative health examination survey called the Health 2000 Survey was carried out from 2000 to 2001. The data for this study were obtained from 4859 subjects aged 30 to 64 years who had participated in an interview, been clinically examined, and returned a self-administered questionnaire. The questionnaire included a SOC scale which was a 12-item version of the SOC-13 scale. Based on a clinical examination for TMD, the following variables were formed: maximum interincisal distance <40 mm, clicking, crepitation, pain in the temporomandibular joints (TMJs), and pain in the masticatory muscles. Odds ratios (OR) and 95% confidence intervals (CI) were estimated using logistic regression models. RESULTS: Subjects with low SOC had higher odds to have distinct TMD findings, especially masticatory muscle pain, than those with high SOC. After adjustment for confounders, those with low SOC had more than twofold odds to have masticatory muscle pain (in at least one painful site) compared to those with high SOC (OR 2.2, 95% CI 1.4-3.6). Low SOC was also associated with TMJ pain on palpation (OR 3.2, 95% CI 1.5-6.6). CONCLUSION: Low SOC associates with myogenous TMD findings. SOC as a psychosocial aspect has a role in the background of TMD.

PROBIOTICS AND PERIODONTAL DISEASE.

STAMATOVA IVA, MEURMAN JUKKA H.
PROBIOTICS: HEALTH BENEFITS IN THE MOUTH

STAMATOVA IVA, MEURMAN JUKKA H.

ABSTRACT: Probiotics or health-beneficial bacteria have only recently been introduced in dentistry and oral medicine after years of successful use in mainly gastro-intestinal disorders. The concept of bacteriotherapy and use of health-beneficial micro-organisms to heal diseases or support immune function was first introduced in the beginning of the 20th century. Later the concept lead to the development of modern dairy industry and even today most probiotic strains are lactobacilli or bifidobacteria used in milk fermentation. The mechanisms of probiotic action are mainly unknown but the inter-microbial species interactions are supposed to play a key role in this together with their immuno-stimulatory effects. The introduction of probiotic bacteria in the mouth calls for ascertainment of their particular safety. Since acid production from sugar is detrimental to teeth, care must be taken not to select strains with high fermentation capacity. The first randomized controlled trials have nevertheless shown that probiotics may control dental caries in children due to their inhibitory action against cariogenic streptococci. Less evidence exists on their role in periodontal disease or oral yeast infections. Furthermore the best vehicles for oral probiotic applications need to be assessed. So far mainly dairy products have been investigated but other means such as probiotics in chewing gums or lozenges have also been studied. From the clinical practitioner’s point of view direct recommendations for the use of probiotics cannot yet be given. However, scientific evidence so far indicates that probiotic therapy may be a reality also in dentistry and oral medicine in the future.

IN VITRO EVALUATION OF YOGHURT STARTER LACTOBACILLI AND LACTOBACILLUS RHAMNOSUS GG ADHESION TO SALIVA-COATED SURFACES.

STAMATOVA I, KARI KIRSTI, VLADIMIROV S, MEURMAN JUKKA H.

AIM: The aim of the study was to evaluate the adhesion of Lactobacillus delbrueckii subsp. bulgaricus and Lactobacillus rhamnosus strain GG to saliva-coated surfaces in vitro. METHODS: Fifteen radiolabeled dairy L. delbrueckii subsp. bulgaricus strains and L. rhamnosus GG were tested for their ability to adhere to saliva-coated hydroxyapatite beads and polystyrene microtiter plates and the radioactivity was measured by liquid scintillation counter. The effects of lysozyme on the adhesion of lactobacilli and of pretreatment with lactobacilli on the adhesion of Streptococcus sanguinis were also assessed. RESULTS: All strains tested adhered to saliva-coated surfaces but with significantly different binding frequencies. The adhesion of the L. delbrueckii subsp. bulgaricus strains remained lower in comparison to L. rhamnosus strain GG. One L. delbrueckii subsp. bulgaricus strain showed binding frequency comparable to S.
sanguinis. Lysozyme pretreatment of the samples significantly increased lactobacillus adhesion to saliva-coated surfaces. CONCLUSION: The present results showed significant variations in the adhesion capacity of the Lactobacillus strains studied. Adhesion to oral surfaces is of primary importance for bacterial colonization in the mouth. Only one of the L. delbrueckii subsp. bulgaricus dairy starter culture strains investigated had a high adhesion percentage. This strain might then be considered for further investigations in the oral environment.

A NOVEL AND SELECTIVE MEMBRANE TYPE-1 MATRIX METALLOPROTEINASE (MT1-MMP) INHIBITOR REDUCES CANCER CELL MOTILITY AND TUMOR GROWTH.

SUOJANEN JUHO, SALO TUULA, KOIVUNEN ERKKI, SORSA TIMO, PIRILÄ EMMA.
Cancer biology & therapy.  8 (24): 2362-2370, 2009

Matrix metalloproteinases (MMPs), and especially membrane type-1 matrix metalloproteinase (MT1-MMP, MMP-14), play a role in cancer progression and can have a prognostic value. Various synthetic broad-spectrum MMP inhibitors have been developed but have had little success in cancer patient treatment owing to side effects. Until recently, selective targeting of specific MMPs has not been possible due to lack of specific inhibitors. Here we have developed a selective MT1-MMP peptide-inhibitor GACFSIAHECGA, which did not affect the activities of many other MMPs including MMP-1, -2, -3, -7, -8, -9, -10, -11, -12, -13, -15, -17 or -20. In a fluorescent peptide cleavage assay it displayed an IC(50) value of 150 microM. The peptide effectively inhibited the migration and invasion of cancer cell lines in vitro. Furthermore, in vivo the peptide reduced the growth of tongue carcinoma xenografts and prolonged the survival of mice. Overall these results suggest that selective MT1-MMP inhibitors may have utility as anticancer agents.

TRANEXAMIC ACID CAN INHIBIT TONGUE SQUAMOUS CELL CARCINOMA INVASION IN VITRO.

SUOJANEN JUHO, SORSA TIMO, SALO TUULA

OBJECTIVES: Tranexamic acid (TA) is an inhibitor of plasminogen activation commonly used in surgery. Plasmin, the end product of plasminogen activation, degrades fibrin in the thrombus, leading to thrombolysis. However, plasmin is also associated with progression of several cancers and with cancer-associated matrix metalloproteinase-9 (MMP-9) activation. As the gelatinases MMP-2 and -9 are involved in cancer progression, several antigelatinolytic drugs have been developed as potential anticancer
therapeutics. We previously developed gelatinases targeting peptide CTT1 capable of inhibiting carcinoma growth. STUDY DESIGN: The effects of TA and CTT1 on tongue carcinoma aggressiveness were evaluated in an in vitro assay of human HSC-3 and SCC-25 cells. MATERIALS AND METHODS: The cells were cultured with or without TA and CTT1 and their proMMP-9 production and activation were analysed with Western immunoblotting and gelatin zymography. Their effects on tongue carcinoma invasion were analysed in a Matrigel assay. RESULTS: Tranexamic acid alone and in combination with CTT1 can inhibit tongue SCC invasion in vitro, at least partially explained by its property of reducing the plasmin-mediated activation of proMMP-9. CONCLUSIONS: These data suggest that patients undergoing surgical therapy for large oral malignancies may cobenefit from prolonged TA therapy, because of its antithrombolytic and antitumour properties.

SIMPLE BONE CYST: A RADIOLOGICAL DILEMMA.

SUOMALAINEN ANNI, APAJALAHTI SATU, KUHLEFELT M, HAGSTRÖM JAANA

An asymptomatic cystic lesion in the corpus region on the right side of the mandible was detected in a panoramic radiograph of a 13-year-old girl, taken for orthodontic reasons. MR examination revealed a cavity filled with fluid and thin-rim peripheral contrast enhancement of the lesion similar to an odontogenic cyst lined with epithelium. The clinical and histological diagnosis of the lesion was a simple bone cyst. This report demonstrates the confounding similarity of the MR findings of a simple bone cyst to an odontogenic cyst.

DOSIMETRY AND IMAGE QUALITY OF FOUR DENTAL CONE BEAM COMPUTED TOMOGRAPHY SCANNERS COMPARED WITH MULTISLICE COMPUTED TOMOGRAPHY SCANNERS.

SUOMALAINEN ANNI, KILJUNEN TIMO, KÄSER YVONNE, PELTOLA JAAKKO, KORTESNIEMI MIKA

OBJECTIVES: The aim of this study was to evaluate the radiation dose and image quality of four dental cone beam CT (CBCT) scanners, and to compare them with those of two multislice CT (MSCT) scanners. METHODS: Tissue doses were measured using a tissue-equivalent anthropomorphic RANDO Head Phantom(R)) with thermoluminescence doseometers (TLD). An RSVP Head Phantom(TM) with a specially designed cylindrical insert was used for comparison of image quality and absorbed dose. Image quality was evaluated in the form of contrast-to-noise ratio (CNR) and modulation transfer function (MTF). RESULTS: Using standard imaging parameters, the effective
doses varied between 14 microSv and 269 microSv (International Commission on Radiation Protection (ICRP) 1990) and 27 microSv and 674 microSv (ICRP 2008) with the CBCT scanners, and between 350 microSv and 742 microSv (ICRP 1990) and 685 microSv and 1410 microSv (ICRP 2008) with the MSCT scanners. The CNR of the CBCT and MSCT scanners were 8.2-18.8 and 13.6-20.7, respectively. Low-dose MSCT protocols provided CNRs comparable with those from CBCT scanners. The 10% MTF of the CBCT scanners varied between 0.1 mm(-1) and 0.8 mm(-1), and was 0.5 mm(-1) for all the MSCT protocols examined. CONCLUSIONS: CBCT scanners provide adequate image quality for dentomaxillofacial examinations while delivering considerably smaller effective doses to the patient. Large variations in patient dose and image quality emphasize the importance of optimizing imaging parameters in both CBCT and MSCT examinations.

CYNICAL HOSTILITY AS A DETERMINANT OF POOR ORAL HEALTH STATUS IN AN ADULT POPULATION.

SUOMINEN-TAIPALE A. L, METTOVAARA H.- L, UUTELA A, HÄRKÄNEN T, VEHKALAHTI MIIRA, KNUUTTILA M. L.

Our aim in this study was to determine whether there is an association between cynical hostility and clinically determined poor oral health, and whether this association is confounded by socioeconomic position and mediated by health behavior. The sample consisted of 4,207 dentate Finns, 30-64 yr of age. Oral health was measured in terms of numbers of missing teeth, of decayed teeth, and of teeth with periodontal pockets (> or = 4 mm). Cynical hostility was measured using the cynical distrust self-administered questionnaire. The subjects with the highest level of cynical hostility had fewer teeth, and a greater number of decayed teeth as well as teeth with deepened periodontal pockets compared to subjects with the lowest level of cynical hostility. The associations between cynical hostility and number of missing and decayed teeth were clearly confounded by level of education. Poor oral health behavior was shown to be a possible mediator between cynical hostility and number of decayed teeth, but not of missing teeth or teeth with deepened periodontal pockets. General health-related behavior did not serve as a possible mediator in any of the associations. In conclusion, cynical hostility can be considered as a risk marker for poor oral health. Interventions aimed to improve oral health should focus on psychosocial factors and on less-educated subjects.
CHANGING TRENDS IN CAUSES AND PATTERNS OF FACIAL FRACTURES IN CHILDREN.

THORÉN HANNA, ISO-KUNGAS PETRI, IIZUKA TATEYUKI, LINDQVIST CHRISTIAN, TÖRNWALL JYRKI

OBJECTIVE: To review the epidemiology of facial fractures in children and to analyze whether it has changed over time. STUDY DESIGN: Retrospective review of records of children aged < or = 15 years diagnosed for fracture during 2 10-year periods. RESULTS: A total of 378 children were diagnosed with fractures, 187 in 1980-1989 and 191 in 1993-2002. The proportion of children with mandibular fractures decreased by 13.6 percentage-points from the first period to the second, whereas the proportion of patients with midfacial fractures increased by 18.7 percentage-points. Assault as a causative factor increased by 5.5 percentage-points, almost exclusively among children aged 13-15 years, with a high percentage (23.5%). CONCLUSIONS: Recognition of a change in fracture patterns over time is probably due to the increased use of computerized tomographic scanning.

DOES PERIOPERATIVE GLUCOCORTICOSTEROID TREATMENT CORRELATE WITH DISTURBANCE IN SURGICAL WOUND HEALING AFTER TREATMENT OF FACIAL FRACTURES? A RETROSPECTIVE STUDY.

THORÉN HANNA, SNÄLL JOHANNA, KORMI EEVA, NUMMINEN LAURA, FÄH RETO, IIZUKA TATEYUKI, LINDQVIST CHRISTIAN, TÖRNWALL JYRKI

PURPOSE: To clarify whether perioperative glucocorticosteroid treatment used in association with repair of facial fractures predisposes to disturbance in surgical wound healing (DSWH). PATIENTS AND METHODS: Retrospective review of records of patients who had undergone open reduction, with or without osteosynthesis, or had received reconstruction of orbital wall fractures during the 2-year period from 2003 to 2004. RESULTS: Steroids were administered to 100 patients (35.7%) out of a total of 280. Dexamethasone was most often used, with the most common regimen being dexamethasone 10 mg every 8 hours over 16 hours, with a total dose of 30 mg. The overall DSWH rate was 3.9%. The DSWH rate for patients who had received perioperative steroids was 6.0%, and the corresponding rate for patients who did not receive steroids was 2.8%. The difference was not statistically significant. An intraoral surgical approach remained the only significant predictor to DSWH. CONCLUSIONS: With regard to DSWH, patients undergoing operative treatment of facial fractures can
safely be administered doses of 30 mg or less of perioperative glucocorticosteroids equivalent to dexamethasone.

WORKING PROFILES OF DENTAL HYGIENISTS IN PUBLIC AND PRIVATE PRACTICE IN FINLAND AND NORWAY.

TSEVEENJAV BATTSETSEG, VIRTANEN JORMA, WANG N. J, WIDSTRÖM E.

AIM: The aim was to compare the working profiles of Finnish and Norwegian dental hygienists in public and private practice. To this end, we compared the procedures performed, the type of patients and the time devoted to different tasks. SUBJECTS AND METHODS: A questionnaire survey was originally conducted among a representative sample of dental hygienists in Finland (n = 595) and all authorized dental hygienists in Norway (n = 1,138) in 2004. The questionnaires collected data on the dental hygienists’ age, gender, year of graduation, working experience, work sector (private or public), working time spent on different activities and patient groups. The questionnaire also assessed how frequently the dental hygienists performed 25 different treatment measures. RESULTS: The Norwegian dental hygienists spent 45.4% of their clinical time on check-ups, whereas the Finns spent 49.9% of their time scaling. Dental hygienists in Finland and Norway working in the public sector spent 42.9% and 74.6% of their working time dealing with children and youth respectively. CONCLUSIONS: The working profiles of dental hygienists in Finland and Norway were quite similar, although differences in distribution by activities, type of patients and treatment measures do exist. The main activity of the dental hygienists was clinical work. The most commonly practised clinical activity among Finnish dental hygienists was scaling, and among Norwegians, check-ups. Public dental hygienists in both countries dealt mainly with children and youths. Oral hygiene instruction was the most commonly reported treatment measure among both Finns and Norwegians.

CHRONIC CANDIDOSIS AND ORAL CANCER IN APECED-PATIENTS: PRODUCTION OF CARCINOGENIC ACETALDEHYDE FROM GLUCOSE AND ETHANOL BY CANDIDA ALBICANS.

UITTAMO JOHANNA, SIIKALA EMILIA, KAIHOVAARA PERTTI, SALASPURO MIKKO, RAUTEMAA RIINA
EFFECT OF DIRECTORIAL INTERVENTION ON WEB-BASED STUDENT FEEDBACK.

VIRTANEN JORMA, SUOMALAINEN KIMMO, AARNIO M, SILENTI M, MURTOMAA HEIKKI

The Medical Faculty of the University of Helsinki decided to employ a web-based evaluation system as an integral and essential part of all courses beginning in the autumn term of 2006. OBJECTIVES: To analyse the effects of the intervention on dental students’ web-based responses at the University of Helsinki, Finland. SUBJECTS AND METHODS: A previously developed web-based tool was used for all preclinical and clinical courses from the beginning of the 2006-2007 academic year. We analysed data sets of student feedback for all courses before (2005-2006) and after (2006-2007) the intervention. We then compared the quantity and quality of the students’ feedback for the six standardised questions used in the evaluation, and calculated the means and standard deviations of values obtained with a Likert scale. The students' assessments in the open questions were categorised according to key issues. RESULTS: Implementation of the system resulted in a considerable increase in student feedback: the mean response rate for the preclinical phase rose from 59% (SD 15.0; range 25-80) before the intervention to 90% (SD 9.6; range 72-100) after it. In the clinical phase, the response rates more than doubled from 34% (SD 15.9; range 9-69) to 73% (SD 12.9; range 45-100). The students’ assessments showed no significant change despite the marked rise in response rates. The educators' positive attitude towards the students was appreciated (4.2-4.3) whereas the general goals for the courses in the clinical phase seemed unclear to the students (3.4) (P < 0.05). CONCLUSIONS: Web-based evaluation as an integral part of all courses in the dental curriculum proved successful: shortly after the intervention, we observed a considerable increase in student feedback with no significant change in quality.

CONVERGENT SIGNALLING THROUGH FGFR2 REGULATES DIVERGENT CRANIOFACIAL MORPHOGENESIS.

VEISTINEN LOTTA, ÅBERG THOMAS, RICE DAVID

Fibroblast growth factor receptor 2 (Fgfr2) has two splice variants IIIb and IIIc, which are unique in function and localization. Signalling through Fgfr2IIIb controls epithelial-mesenchymal interactions, which regulate morphogenesis during the development of several organs including the palate and tooth. In this study, we confirm that molar tooth development in Fgfr2IIIb(-/-) mice is arrested early in development and that the molar teeth of Fgf10(-/-) mice develop through all the normal stages of morphogenesis. We show that the molar phenotype of Fgfr2IIIb(-/-) mice is, in part, owing to reduced cell
proliferation in both epithelial and mesenchymal compartments. We also show that the developing molar teeth of Fgf10(-/-) mice exhibit reduced cell proliferation. However, this reduction is not sufficient to arrest molar development. Recent evidence has indicated that Fgfr2IIIb/Fgf10 signalling is active in the calvaria in some pathological situations as heterozygous deletion of Fgfr2 exon IIIc in mice leads to ectopic expression of Fgfr2IIIb in the calvarial bones and causes craniosynostosis. Here, we investigate the mRNA expression of Fgfr2IIIb and Fgfr2IIIc as well as their ligands Fgf3, -7 and -10 in the developing murine tooth, palate and calvaria. We show that Fgf7 is expressed in the calvarial mesenchyme adjacent to the developing frontal bone and Fgf10 is expressed by osteoprogenitors in the developing frontal bone condensation. Taken together, we highlight the overlapping roles of Fgfr2IIIb/Fgf10 signalling in controlling epithelial-mesenchymal interactions during normal palate and tooth morphogenesis and how elevated signalling through Fgfr2IIIb/Fgf10 solely within the mesenchyme can result in abnormal calvarial morphogenesis. (c) 2009 Wiley-Liss, Inc.

IMPACTS OF TOOTHBRUSHING FREQUENCY ON PERIODONTAL FINDINGS IN A GROUP OF ELDERLY LITHUANIANS.

VYSNIAUSKAITE SONATA, VEHKALAHTI MIIRA

PURPOSE: The aim of this study was to evaluate the severity of the findings of dental plaque, calculus and deepened periodontal pockets in relation to self-reported toothbrushing frequency in a group of elderly Lithuanians. The authors hypothesised that those reporting twice daily toothbrushing exhibit less severe periodontal findings.

MATERIALS AND METHODS: A cross-sectional study of 94 dentate patients aged 60 or older was conducted at two public dental offices in Lithuania. Half-mouth recordings of dental plaque, calculus and deepened periodontal pockets were expressed as mean values per subject. These indicators described the severity of periodontal findings. A self-administered questionnaire provided information on toothbrushing frequency, age, gender and education. Statistical evaluation included chi-square test, analysis of variance and logistic regression.

RESULTS: None of the subjects were plaque-, calculus- or pocket-free. Of all, 26% reported that they brushed their teeth at least twice daily, 36% once daily and 38% less frequently. Women (P = 0.004), younger (P = 0.002) and higher educated respondents (P < 0.001) reported twice daily toothbrushing more frequently than did their counterparts. Twice daily toothbrushing was clearly associated with the least severe conditions regarding dental plaque (P = 0.03) and deepened pockets (P < 0.001), but not calculus (P = 0.39). Logistic regression models revealed higher level of education as the strongest factor odds ratio (OR = 2.7; P = 0.04) explaining the lowest scores of dental plaque. Higher frequency of toothbrushing was the strongest factor (OR = 2.1; P = 0.03) to explain the lowest scores of deepened periodontal pockets. CONCLUSION: Twice daily toothbrushing contributes to better periodontal health in the elderly subjects and should be encouraged at every dental appointment.
DIFFERENTIAL PROCESSING OF {ALPHA}- AND {BETA}-DEFENSIN PRECURSORS BY MATRIX METALLOPROTEINASE-7 (MMP-7).


Proteolytic processing of defensins is a critical mode of posttranslational regulation of peptide activity. Because mouse alpha-defensin precursors are cleaved and activated by matrix metalloproteinase-7 (MMP-7), we determined if additional defensin molecules, namely human neutrophil defensin pro-HNP-1 and beta-defensins, are targets for MMP-7. We found that MMP-7 cleaves within the pro-domain of the HNP-1 precursor, a reaction that does not generate the mature peptide but produces a 59-amino acid intermediate. This intermediate, which retains the carboxyl-terminal end of the pro-domain, had antimicrobial activity, indicating that the residues important for masking defensin activity reside in the amino terminus of this domain. Mature HNP-1 was resistant to processing by MMP-7 unless the peptide was reduced and alkylated, demonstrating that only the pro-domain of alpha-defensins is normally accessible for cleavage by this enzyme. From the 47-residue HBD-1 precursor, MMP-7 catalyzed removal of 6 amino acids from the amino terminus. Neither a 39-residue intermediate form of HBD-1 nor the mature 36-residue form of HBD-1 was cleaved by MMP-7. In addition, both pro-HBD-2, with its shorter amino-terminal extension, and pro-HBD-3 were resistant to MMP-7. However, human and mouse beta-defensin precursors that lack disulfide bonding contain a cryptic MMP-7-sensitive site within the mature peptide moiety. These findings support and extend accumulating evidence that the native three-dimensional structure of both alpha- and beta-defensins protects the mature peptides against proteolytic processing by MMP-7. We also conclude that sites for MMP-7 cleavage are more common at the amino termini of alpha-defensin rather than beta-defensin precursors, and that catalysis at these sites in alpha-defensin pro-domains results in acquisition of defensin activity.

SCHOOL-BASED EDUCATION TO IMPROVE ORAL CLEANLINESS AND GINGIVAL HEALTH IN ADOLESCENTS IN TEHRAN, IRAN.


BACKGROUND: Schools can be an important setting for health education programmes, controlling the growing burden of oral diseases and promoting oral health. Aim. The aim of this study was to evaluate the short-term effect of school-based educational intervention on oral cleanliness and gingival health of 15-year-olds in Tehran, Iran. DESIGN: The present cluster randomized trial was based on exposing students (n = 287; control, n = 130) at public schools to oral health knowledge through a leaflet or a videotape. The outcome was evaluated after 12 weeks. A positive outcome was defined as
at minimum a 50% reduction in numbers of teeth with dental plaque or gingival bleeding compared to baseline. Evaluation included percentage changes, number needed to treat (NNT), and students' self-assessment. RESULTS: At baseline, all students had dental plaque, and 93% had gingival bleeding on at least one index tooth. Positive outcome for oral cleanliness was 58% (P < 0.001) of the students in the leaflet group, 37% (P < 0.001) in the videotape group, and 10% of controls. Corresponding figures for gingival health were 72% (P < 0.001), 64% (P < 0.001), and 30%. For oral cleanliness, NNT was 2 in the leaflet and 3 in the videotape group; for gingival bleeding, NNT in both groups was 3. More than two-thirds of the students assessed their oral health behaviours as having improved moderately. CONCLUSION: An easy-to-organize and inexpensive school-based intervention can in the short term be effective in improving oral cleanliness and gingival health among adolescents; in particular, in countries with a developing oral health system.
Undergraduate students made technically good root fillings

Inadequate technical quality of root fillings has been associated with higher rate of periapical pathosis in endodontically treated teeth. The aim of this study was to evaluate the periapical status of endodontically treated teeth and the technical quality of root fillings made by undergraduate students at the Institution of Dentistry, University of Helsinki.

A total of 63 individuals of a group of 136 patients who received endodontic therapy in teaching clinic in Helsinki were available for a control visit. The endodontic therapy was performed 5 years previously by 4th and 5th year undergraduate students under supervision. At the control visit, clinical status, radiographic quality of root fillings and periapical findings (PAI score 1-5) were recorded. These 63 patients had a total of 87 endodontically treated teeth (27 incisors, 24 premolars and 36 molars), which were examined clinically and radiologically. One radiograph was unsuitable, so a final total of 86 teeth were analyzed radiographically. Of the examined teeth, 80.2% had fillings of acceptable length, while 5.8% were overfilled and 14.0% were short. No voids were present in 69(80.2%) teeth. Root-filled teeth with adequate
lateral seal and root filling length were associated with better periapical status. A total of 80.2% of the analyzed teeth had a PAI score of 1 or 2 and were considered healthy. Compared to corresponding studies, the outcome of root canal treatments and the technical quality of root fillings made by undergraduates at Helsinki university Dental Clinic was good.

**TIETOKONEEN NÄYTTÖ JA KÄYTTÖÖMPÄRISTÖN VALAISTUS OVAT DIGITAALISEN RÖNTGENKUVAN LAATUTEKIÖITÄ.**

EKHOLM MARJA, PELTOLA JAAKKO

**LÄHTÖKOHDAT:**

**TAVOITTEET:**
Laadunvarmistusohjeistukseen tavoitteena on pitää potilaiden ja henkilökunnan säteily-altistus mahdollisimman pienenä ja digitaalisten röntgenkuvien tekninen laatu hyvänä. Tämän artikkelin tarkoituksena on perehtyä digitaalisten intra-oraali- ja panoraamatomografialaitteiden sekä niihin liittyvien välineiden tekniseen laadunvarmistukseen.

**JOHTOPÄÄTÖKSET:** Digitaalitekniikka tulee korvamaan hammaslääketieteellisessä radiologiassa filmikuvauksen. Uudella ja vanhalla menetelmällä on kuitenkin paljon yhteistä, sillä molemmissa korkealaatuisten kuvien ottaminen edellyttää jokaisen kuvantamisketjuun kuuluvan vaiheen ymmärtämistä ja huollollista toteuttamista. Digitaalinen röntgenkuvaus edellyttää lisäksi tietyt tekniikkoihin perehtymistä.

**Quality Assurance in Clinical Radiography**
Digital radiography in dentistry began nearly 20 years ago, when the first intraoral sensor became commercially available. Digital imaging is rapid, and dark-room processing is avoided; but to ensure high and constant image quality, many other important elements must be considered. In Finland at present there are no official guidelines for quality control of digital dental radiographs. The digital imaging chain consists of x-ray source, digital receptor (digital sensor or imaging phosphor plate), computer and display. A scanner is also needed in phosphor plate imaging. Quality of a digital radiograph is conditional on every link on the digital imaging chain, and the image quality should be monitored at regular intervals. Among other things, the x-ray generation of intraoral- and panoramic tomography machines,
condition of the image receptors and phosphor plate scanners must be controlled. Phosphor plates should be kept clean and undamaged since scratches cause artefacts, which deteriorate the quality of the image. In addition, a constancy test with universal test phantom should be performed regularly.

Digital radiographs are viewed on a display screen instead of a light box. The most important characteristics of a medical display are luminance, resolution, contrast and gray-scale performance. The luminance of the display decreases with time; and if the requirements for the test image are not fulfilled, the display should no longer be used.

Because the ambient level of light for interpreting digital radiographs should be as low as 10-25 lux, the bright light of an operating room is not optimal for reading digital radiographs.

High image quality and accuracy in diagnostics should be maintained in digital dental radiographs. This can be achieved by controlling at regular intervals all factors that influence the quality of the image.

KARIEKSEN SYNTY, ETENEMINEN JA PYSÄYTTÄMINEN.

KOTIRANTA ANJA, ALALUUSUA SATU


ANTIMIKROBISET SUUVEDET OVAT OIKEIN KÄYTETTYINÄ HYÖDYLLISIÄ.

LAHTINEN AIRA, AINAMO ANJA
Suomen Hammaslääkärilehti N.S. 16 (5): 30-41, 2009

Antimikrobisten suuvesien valikoima on laaja

LÄHTÖKOHDAT

lentulehdusta/ parodontiittia sairastaa lähes kolme neljästä suomalaisesta. Teoriassa pelkkä hyvä mekaaninen puhdistus riittäisi suun terveyden ylläpitämiseen. Käytännössä vain harvat onnistuvat pitämään mikrobibiofilmin poissa kaikkien hampaitensa kaikilta pinnoilta.

MENETELMÄT

Artikkelin on kirjallisuuskatseena antimikrobisten suuvesien vaikutuksesta suun mikrobeihin. biofilmiin ja ientulehdukseen sekä analyysi suuvesien sisältämän alkoholin väitetystä suusyöpäriskistä.
TULOKSET
Useiden antimikrobisten suunhoitoaineiden on osoitettu vähentävän suun mikrobeja. 

tampaiden pinnalle muodostuvaa plakkia ja ientulehduksen kehittymistä. Parhaiten 
dokumentoituja ovat kloorheksidiinivalmisteiden ja eteerisiä öljyjä sisältävien suuves-
ien vaikutukset.

Suuvet ja suusyövän yhteyksistä tutkimustulokset ovat erisuuntaisia ja ristiriitaisia. 
eikä annos-vastesuhdetta saati syy-seuraussuhdetta ole todettu. Eräissä ryhmissä suuvettä 
käyttävillä suusyövän riski on ollut vähän kohonnut, eräissä taas pienentynyt. Useim-
missa tutkimuksissa ei ole todettu yhteyttä.

JOHTOPÄÄTÖKSET
Antimikrobisten suuvet vähentävät mekaanisen puhdistuksen lisänä on hyötyä erityisesti 
ientulehdukselle ja parodontiitille alttiille henkilöille sekä potilaille, joiden vastustuskky 
on heikentynyt. Lisäksi antibakteeriset suuvet vähentävät infektioriskiä suun toimenpi-
teiden yhteydessä.

Antimicrobial mouthwashes are useful in proper use

Several antimicrobial mouth-care formulas have been shown to reduce oral microbes, 
dental plaque and gingivitis when used in combination with mechanical tooth cleaning. 
The most widely investigated are chlorhexidine (CHX) preparation and essential oils 
(EO). CHX has proven to be most effective but because of staining and taste alterations, 
is suitable primarily for temporary use. EO-mouthwashes have no such side-effects, and 
are suitable for daily use. Mouthwashes are most effective for elimination of planctonic 
bacteria and on free surfaces of the teeth. Thick interproximal biofilm is best removed 
with toothpicks before rinsing with antibacterial mouthwash. Reduction of supragingival 
plaque by mechanical cleaning and/or antimicrobial agents even results in reduction of 
subgingival plaque.

Antimicrobial mouthwashes may be beneficial for daily oral hygiene, for disinfection 
before oral procedures to reduce contamination risks and microbial aerosols, and to 
reduce oral microbe before and after oral surgery. They may improve oral hygiene and 
prevent infection, especially in compromised patients.

ANTIMIKROBiset suuvedet vähentävät oikein käytettyinä 
suun mikrobeja ja ientulehdusta.

Lahtinen Aira, Ainamo Anja 

Antimikrobiset suuvet vähentävät suun mikrobeja, bakteeribiofilmiä hampaissa ja 
ientulehduksen kehittymistä. Niillä voidaan täydentää suun ja hampaiden puhdistusta. 
Eniten tutkimuksia päivittäisessä käytössä on Listerine-suuvostä, jotka eivät värjää 
hampaata tai aiheuta makuhäiriöitä. Suuvesilä ja suusyövällä ei ole osoitettu syy-
seuraussuhdetta. Sen sijaan on osoitettu, että hyvä suuhygienia on suusyövällä suojaa 
tekijä. Edellä esitetyt asiat ilmenevät hiljan Suomen Hammaslääkärilehdessä julkaisusta 
katsauksesta (1). Tähän artikkeeliin on kerätty katsauksen keskeiset asiat.
HAMMASLÄÄKÄRINTOIMIEN HARJOITTAMISEN VALVONTA.

LEHTONEN LASSE, VIRTANEN JORMA


AMALGAAMI.

MEURMAN JUKKA H.


DARWINISMI.

MEURMAN JUKKA H.

FLETCHERISMI.

MEURMAN JUKKA H.


SIKAINFLUENSSA.

MEURMAN JUKKA H.

Suun terveydenhuollossa uuden H1N1-viruksen tulemista ei tarvitse pelätä, kunhan tavanomaiset hygieniatoimet ovat moitteettomat, toteaa J. H. Meurman Lääke ja tiede -kirjoituksessaan.

SUUN JA HAMPAIDEN PAIKALLISHOITOAINEEIT

MEURMAN JUKKA H.

TUMMAN SUKLAAN LUMO.

MEURMAN JUKKA H.

Tumman suklaan terveysvaikutuksia tarkastelee J.H. Meurman Lääke- ja tiede -palstallaan.

VUODEN 2008 FYSIOLOGIAN JA LÄÄKETIETEEN NOBELIN PALKINOT VIRUSTUTKJOILLE.

MEURMAN JUKKA H.

Tukholman Nobel-juhlassa palkittiin kolme virustutkijaa fysiologian ja lääketieteen palkinnoilla. Heistä Harald zur Hausen promovoitiin Helsingin yliopiston kunniatohtoriksi lääketieteellisen tiedekunnan vuoden 2000 promootiossa, samoista

TUBERKULOOSI AIKUISEN KAULALLA.

RUOHONEN RAUNI, KOTILAINEN HANNELE, RAUTEMAA-RICHARDSSON RIINA, MATTILA EERO, PITKÄRANTA ANNE, LAUHIO ANNELI

- Keuhkojen ulkopuolella tuberkuloosi esiintyy yleisimmin kaulalla, jossa se voi olla monessa elimessä, tavallisimmin imusolmukkeissa.

- Tuberkuloosi kaulakyhmyn syynä löytyy erityisesti iäkkäiltä tai maahanmuuttajilta. Siihen ei välttämättä liity yleisireita ja oireilu voi olla hitaasti etenevä.

- Tuberkuloosi diagnooidaan tuberkuloosiviljelyssä, josta tutkitaan myös lääke- herkkyys.

- Kaulan alueen tuberkuloosin diagnostiikassa käytetään myös tuberkuloosi-värjäystä, nukleiihapon osoitusta sekä koepalan histologista tutkimusta.

- Kun epäilee tuberkuloosia, pitää ottaa myös keuhkokuvaa ja tutkia yskiviltä ysköviltä näitä ysköviltä värjäys- ja viljelynäytettä, sillä yskösvärjäyspositiivinen tuberkuloosi on tartuntavaarallinen.

- Kaulakyhmyn erotusdiagnostiikassa tulee aikuisella huomioida myös muita syyt, kuten pahanlaatuiset kasvaimet.

Cervical tuberculosis in adult patients   Julkaistu 18.09.2009

Extrapulmonary tuberculosis in Finland is found most often in the cervical area, where it can be found in many organs such cervical lymph nodes, the cervical spine, salivary glands, thyroid and trachea. The most common form of extrapulmonary tuberculosis is cervical lymph node tuberculosis, which can occur without systemic signs or symptoms and progress only slowly. However, other differential diagnoses such as malignancies have to be considered, especially among adults. It is also important to investigate the otorhinolaryngological and the dental status. Culture is the most important method for the diagnosis of tuberculosis and also enables drug sensitivity testing. PCR based methods can be used, as well as cytological and histopathological investigations to reveal granulomatous inflammation with caseous necrosis. In Finland cervical lymph node tuberculosis is found especially among the elderly but also among immigrants from high tuberculosis incidence countries.
KOULUTUS EI RATKAISE HAMMASLÄÄKÄRIPULAA.

SORSA TIMO, TJÄDERHANE LEO, SALO TUULA
Helsingin sanomat. 19.1.2009

HAMMASKIVEN POISTO RASITTAEN ENITEN KÄTTÄ.
TAKALA ESA-PEKKA, TOIVONEN RISTO, VATAJA KATARIINA, MURTOMAA HEIKKI, VIRTANEN JORMA

Hammaslääkärin työssä on runsaasti työvaiheita, joissa tarvitaan paljon käsivoimaa. Voimaa vaativien tehtävien on todettu liittyvän työperäisiin vaivoihin. Käteen kohdistuvan kuormituksen mitaatamiseen ei ole ollut vakiintuneita menetelmiä. artikkelissa kuvataan kolme menetelmää, jotka kehitettiin hammaslääkärin työssä käteen kohdistuvan kuormituksen mitaatamiseen. Tutkimuksessa käytettyt menetelmät soveltuvat kättä vähemmän kuormittavien työskentelytapojen harjoitteluun sekä uusien työskentelytapojen ja instrumenttien käytettävyyden arviointiin.

ÄÄNTÖELIMISTÖN KEHITYS.

WALTIMO-SIREN JANNA
# INDEX OF AUTHORS

## A

<table>
<thead>
<tr>
<th>Author</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aarnio M</td>
<td>76</td>
</tr>
<tr>
<td>Åberg Thomas</td>
<td>76</td>
</tr>
<tr>
<td>Ackerson Leland K</td>
<td>38</td>
</tr>
<tr>
<td>Ahlberg Jari</td>
<td>26, 49</td>
</tr>
<tr>
<td>Ahmed Haji Omar A</td>
<td>26</td>
</tr>
<tr>
<td>Ainamo Anja</td>
<td>82, 83</td>
</tr>
<tr>
<td>Aksu K</td>
<td>30</td>
</tr>
<tr>
<td>Alaluusua Satu</td>
<td>26, 49, 55, 82</td>
</tr>
<tr>
<td>Alapulli Heikki</td>
<td>26</td>
</tr>
<tr>
<td>Alfthan Georg</td>
<td>43, 47</td>
</tr>
<tr>
<td>Apajalahti Satu</td>
<td>72, 80</td>
</tr>
<tr>
<td>Arola Johanna</td>
<td>64</td>
</tr>
<tr>
<td>Arte Sirpa</td>
<td>47</td>
</tr>
<tr>
<td>ARTICLES IN ENGLISH</td>
<td>26</td>
</tr>
<tr>
<td>ARTICLES IN FINNISH</td>
<td>80, 88</td>
</tr>
<tr>
<td>Arvio P</td>
<td>49</td>
</tr>
<tr>
<td>Åström P</td>
<td>46</td>
</tr>
<tr>
<td>Atilla G</td>
<td>61</td>
</tr>
</tbody>
</table>

## B

<table>
<thead>
<tr>
<th>Author</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bäck Leif</td>
<td>27</td>
</tr>
<tr>
<td>Bascones-Martínez Antonio</td>
<td>28</td>
</tr>
<tr>
<td>Beklen A</td>
<td>29</td>
</tr>
<tr>
<td>Berdeli A</td>
<td>61</td>
</tr>
<tr>
<td>Bernabé E</td>
<td>29</td>
</tr>
<tr>
<td>Besuch Kirsten</td>
<td>80</td>
</tr>
<tr>
<td>Biyikoglu B</td>
<td>30</td>
</tr>
<tr>
<td>Blåfield Harri</td>
<td>44</td>
</tr>
<tr>
<td>BOOKS</td>
<td>16</td>
</tr>
<tr>
<td>Breschi Lorenzo</td>
<td>66</td>
</tr>
<tr>
<td>Broms Ulla</td>
<td>38</td>
</tr>
<tr>
<td>Buduneli N</td>
<td>30</td>
</tr>
<tr>
<td>Buhlin Käre</td>
<td>31</td>
</tr>
<tr>
<td>Bykov Igor L</td>
<td>43, 47</td>
</tr>
</tbody>
</table>
C
Cakmakci Lutfu ........................................................................................................................................35
Carriilho Marcela.....................................................................................................................................66
Cazalis Julia...........................................................................................................................................31
Charoenchaikorn Kesinee ..........................................................................................................................32
Cinar Ayse Basak ......................................................................................................................................33
Claesson Rolf ...........................................................................................................................................41

D
Dickson Clive ...........................................................................................................................................37
Donjacour Anne .......................................................................................................................................37
Duarte Raquel ...........................................................................................................................................37
Dutzan N ..................................................................................................................................................40

E
Eghbal Mohammad J .................................................................................................................................40
Ekholm Marja ...........................................................................................................................................81
El-Segaier Milad .........................................................................................................................................60
Emingil Gülnur ...........................................................................................................................................61
Endal Unni ................................................................................................................................................16
Ess A ........................................................................................................................................................49

F
Fäh Reto ...................................................................................................................................................74
Ferraz Caio ...............................................................................................................................................66
Ferri Nicola ...............................................................................................................................................78
FinnDiane Study Group ..............................................................................................................................55
Forsblom Carol .........................................................................................................................................55
Furuholm J ...............................................................................................................................................42

G
Gagnon Guy ...............................................................................................................................................31
Gamonal J ..................................................................................................................................................40
Ganz Tomas ...............................................................................................................................................78
Ghasemi Hadi ...........................................................................................................................................34
Grenier Daniel ...........................................................................................................................................31
Grönroos Lisa ...........................................................................................................................................55
Groop Per-Henrik ......................................................................................................................................55
### J

<table>
<thead>
<tr>
<th>Name</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jahkola Antti</td>
<td>49</td>
</tr>
<tr>
<td>Janket Sok-Ja</td>
<td>38</td>
</tr>
<tr>
<td>Jauhiainen Matti</td>
<td>43, 47</td>
</tr>
<tr>
<td>Jogestrand T</td>
<td>68</td>
</tr>
<tr>
<td>Johansson Anders</td>
<td>41</td>
</tr>
<tr>
<td>Juusela Pirjo</td>
<td>44</td>
</tr>
</tbody>
</table>

### K

<table>
<thead>
<tr>
<th>Name</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaaja Risto</td>
<td>38</td>
</tr>
<tr>
<td>Kailoaara Perti</td>
<td>75</td>
</tr>
<tr>
<td>Käkelä Reijo</td>
<td>43, 47</td>
</tr>
<tr>
<td>Kallio-Pulkkinen S</td>
<td>46</td>
</tr>
<tr>
<td>Kämpe O</td>
<td>42</td>
</tr>
<tr>
<td>Kardeijer L</td>
<td>30</td>
</tr>
<tr>
<td>Kari Kirsti</td>
<td>50, 70</td>
</tr>
<tr>
<td>Kari Marjatta</td>
<td>44</td>
</tr>
<tr>
<td>Kari Osmo</td>
<td>44</td>
</tr>
<tr>
<td>Kärkkäinen Päivi</td>
<td>48</td>
</tr>
<tr>
<td>Käser Yvonne</td>
<td>72</td>
</tr>
<tr>
<td>Kero Mia</td>
<td>26</td>
</tr>
<tr>
<td>Kerosuo Eero</td>
<td>45</td>
</tr>
<tr>
<td>Kervanto-Seppälä Sari</td>
<td>17, 45</td>
</tr>
<tr>
<td>Kiljinen Timo</td>
<td>72</td>
</tr>
<tr>
<td>Kiuru-Enari Sari</td>
<td>44</td>
</tr>
<tr>
<td>Kiviluoto Tuula</td>
<td>48</td>
</tr>
<tr>
<td>Klinge Björn</td>
<td>31</td>
</tr>
<tr>
<td>Knutttila M</td>
<td>69</td>
</tr>
<tr>
<td>Knutttila M. L</td>
<td>73</td>
</tr>
<tr>
<td>Knutttila Matti</td>
<td>37, 57</td>
</tr>
<tr>
<td>Koivuhonen Erkki</td>
<td>71</td>
</tr>
<tr>
<td>Kööönen Eija</td>
<td>35, 36, 43, 57</td>
</tr>
<tr>
<td>Kööönen Mauno</td>
<td>46, 69</td>
</tr>
<tr>
<td>Kontio R</td>
<td>50</td>
</tr>
<tr>
<td>Konttinen Yrjö T</td>
<td>29</td>
</tr>
<tr>
<td>Korni Eeva</td>
<td>74</td>
</tr>
<tr>
<td>Korpi J. T</td>
<td>46</td>
</tr>
<tr>
<td>Kortesniemi Mika</td>
<td>72</td>
</tr>
<tr>
<td>Koskenvuo Markku</td>
<td>38</td>
</tr>
<tr>
<td>Kotilainen Hannele</td>
<td>86</td>
</tr>
<tr>
<td>Kotilainen Johanna</td>
<td>47</td>
</tr>
<tr>
<td>Kotiranta Anja</td>
<td>16, 80, 82</td>
</tr>
<tr>
<td>Kovanen Petri</td>
<td>43</td>
</tr>
<tr>
<td>Kubilius Ricardas</td>
<td>66</td>
</tr>
</tbody>
</table>
Kuhlefelt M.................................................................72
Kuula Heidi.................................................................18, 47
Kylänpää Leena..............................................................48

M

Lauhio Anneli.................................................................63, 86
Lehto Markku.................................................................55
Lehtonen Lasse...............................................................84
Lehtonen N.................................................................46
Leinonen Maija...............................................................43
Lepistö Anna.................................................................48
Lesaffre E.................................................................40
Lindholm Harri..............................................................49
Lindqvist Christian...................................................50, 64, 74
Lindroos B.................................................................50
Lindroos Kai.................................................................43, 47
Lindstedt Ken.................................................................57
Linjama Tiina.................................................................48
Liuokko Tommi.............................................................27
Lukinmaa Pirjo-Liisa...................................................19, 26, 49

M

Määttä Marko.................................................................44
Maciulskiene Vita........................................................66
Mäkelä M.................................................................56
Mäkiite Antti.................................................................27
Matsuzaki Kiyomi........................................................32
Mattila Eero.................................................................86
Mauno J.................................................................50
Mazzoni Annalisa........................................................66
Mesimäki Karri.............................................................50
Metso T.................................................................56
Mettovaaara H.-L..........................................................73
Meurman Jukka H.................................................28, 38, 42, 45, 50, 51, 58, 68, 69, 70, 84, 85
Miettinen S.................................................................50
Mohelbi S. Z..............................................................52

92
<table>
<thead>
<tr>
<th>Name</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molas M</td>
<td>40</td>
</tr>
<tr>
<td>Muñoz-Corcuera Marta</td>
<td>28</td>
</tr>
<tr>
<td>Murtomaa Heikki</td>
<td>33, 34, 40, 52, 65, 66, 67, 76, 78, 87</td>
</tr>
<tr>
<td>Muthukrishnan Preetika</td>
<td>38</td>
</tr>
<tr>
<td>Nakano Kazuhiro</td>
<td>55</td>
</tr>
<tr>
<td>Nemoto Hirotoshi</td>
<td>55</td>
</tr>
<tr>
<td>Nieminen Anja</td>
<td>44</td>
</tr>
<tr>
<td>Nieminen Mikko T</td>
<td>52</td>
</tr>
<tr>
<td>Nieminen Pekka</td>
<td>47, 53, 62</td>
</tr>
<tr>
<td>Nihtilä Annamari</td>
<td>54</td>
</tr>
<tr>
<td>Nomura Royta</td>
<td>55</td>
</tr>
<tr>
<td>Nordblad A</td>
<td>29</td>
</tr>
<tr>
<td>Norderyd Ola</td>
<td>31</td>
</tr>
<tr>
<td>Nouri Mahtab</td>
<td>78</td>
</tr>
<tr>
<td>Nowak J</td>
<td>68</td>
</tr>
<tr>
<td>Numminen Laura</td>
<td>74</td>
</tr>
<tr>
<td>Nuutila Mika</td>
<td>62</td>
</tr>
<tr>
<td>Nymark Mariann</td>
<td>55</td>
</tr>
<tr>
<td>Nyström Marjatta</td>
<td>39</td>
</tr>
<tr>
<td>Obase Y</td>
<td>66</td>
</tr>
<tr>
<td>Obregón F</td>
<td>40</td>
</tr>
<tr>
<td>Öhlin Hans</td>
<td>60</td>
</tr>
<tr>
<td>Oksaharju Anna</td>
<td>57</td>
</tr>
<tr>
<td>Oksanen Aino M</td>
<td>63</td>
</tr>
<tr>
<td>Ooshima Takashi</td>
<td>55</td>
</tr>
<tr>
<td>Paavonen Jorma</td>
<td>62</td>
</tr>
<tr>
<td>Paju Susanna</td>
<td>43, 57</td>
</tr>
<tr>
<td>Pajukanta R</td>
<td>35</td>
</tr>
<tr>
<td>Palotie Ulla</td>
<td>20, 58</td>
</tr>
<tr>
<td>Parks William C</td>
<td>78</td>
</tr>
<tr>
<td>Pärnänen Pirjo</td>
<td>50, 58</td>
</tr>
<tr>
<td>Partinen Markku</td>
<td>27</td>
</tr>
<tr>
<td>Partinen Markus</td>
<td>49</td>
</tr>
<tr>
<td>Pasley David</td>
<td>66</td>
</tr>
<tr>
<td>Pavlic Alenka</td>
<td>59, 60</td>
</tr>
</tbody>
</table>

93
Suominen-Taipale Liisa ................................................................................................................. 37, 43, 57
Suominen-Taipale A. L ....................................................................................................................... 29, 73
Suomalainen Anni .....................................................................................................................................72
Suojanen Juho ..................................................................................................................................... 21, 71
Stamatova Iva ..................................................................................................................................... 69, 70
Sorsa Timo........................................................... 29, 30, 31, 35, 40, 44, 46, 47, 56, 61, 62, 66, 71, 78, 87
Söder P. O.................................................................................................................................................68
Söder B. ....................................................................................................................................................68
Snäll Johanna ............................................................................................................................................74
Sjödin Bengt ...........................................................................................................................................51
Skurnik Mikael.......................................................................................................................................43
Snäll Johanna...........................................................................................................................................74
Söder B. ....................................................................................................................................................68
Söder P. O.................................................................................................................................................68
Sorsa Timo........................................................... 29, 30, 31, 35, 40, 44, 46, 47, 56, 61, 62, 66, 71, 78, 87
Smatanova Iva ................................................................. 69, 70
Suojanen Juho...........................................................................................................................................21, 71
Suomalainen Annikki .......................................................... 72
Suoimalainen Kimmo ........................................................ 76
Suomalainen Taipale A. L .......................................................... 29, 73
Suomalainen Taipale Liisa ........................................................ 37, 43, 57
Suuronen Riitta ......................................................................................................................................50

T

Takahashi Satoru................................................................. 32
Takala Esa-Pekka......................................................................................... 87
Takano-Yamamoto Teruko........................................................................... 32
Tanabe Shin-ichi .......................................................................................... 31
Taniguchi Naho............................................................................................. 55
Tanskanen Maarit......................................................................................... 44
Tarkkila I........................................................................................................... 51
Tay Franklin .......................................................................................................66
Tehranchi A ......................................................................................................65
Teronen Olli.......................................................................................................67
Tervahartiala Taina .......................................................................................40, 44, 56, 61, 63, 66