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With kind regards

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LONG-TERM CHANGE IN DENTAL PREVENTION AND CHECK-UP INTERVALS IN PUBLIC DENTAL SERVICE IN HELSINKI, FINLAND
HELMINEN SEppo K. J.

The aim of the present study was to track changes in dental state from 1976 to 1999, in Helsinki, Finland, and to evaluate dental prevention measures and the success with which they have been targeted at high-risk groups by Helsinki City Health Department. The study design was longitudinal, dental prevention being evaluated on the basis of five cross-sectional and one follow-up study. Data on dental state and treatments were collected from patient records and from official automatic data processing files.

During the first 10 years, from 1976-1986 there was a substantial decrease in caries occurrence. In 1986, no focusing on risk patients was found. In 1989-91, the percentage of dental prevention in the treatment mix was directly proportional to a decrease in caries prevalence.

In 1999, a positive change was observed in the targeting of caries prevention to 0- to 18-year-old patients. The patients in orthodontic care were receiving more caries prevention. The proposed check-up intervals corresponded to the dental state of children.
The dentists’ age and gender had no impact on the time spent for repeated caries prevention. Young adults’ check-up intervals appeared to function optimally. On the other hand, the feasibility of the DT and CPITN indices as administrative measures of treatment needs in young adults seemed to be minor.

On the whole, the targeting of dental prevention has improved since 1976 and 1986. However recommendations are made for 1) additional training in calibration and usage of a computer-aided program to aid dentists in providing more accurate dental prevention, 2) economic incentives and 3) an administratively more practical dental index. In addition, the cost-effectiveness of the methods used in Helsinki should be studied and compared to methods used elsewhere.

ORAL SELF-CARE AMONG FINNISH ADULTS WITH DIABETES MELLITUS:
A FOCUS ON PERIODONTAL DISEASES

KARIKOSKI AIJA

Diabetes is a well-documented risk factor for periodontal disease, affecting disease susceptibility, progression and severity. While periodontal diseases are multifactorial in nature, oral self-care plays a central role in disease prevention, treatment and maintenance care. The aim of this study was to evaluate oral self-care and its determinants among Finnish adults with diabetes. Moreover, the effect of oral health promotion intervention related to motivation to regular dental visits was studied. The intervention was implemented in cooperation with dental health professionals and diabetes nurses. The research consisted of a nation-wide questionnaire study (n=420) and a longitudinal community trial (n=120) among type 1 and type 2 diabetes patients visiting the Salo Regional Hospital Diabetes Clinic.

Oral self-care among adults with diabetes is inadequate, particularly when this group’s increased risk for periodontal diseases is considered. In addition to commonly identified determinants of frequent oral health behaviours, the results indicated the importance of awareness and appreciation of oral health. A high prevalence of periodontal pockets (CPITN 3 or 4) among the study population was also found. Evaluation of oral health promotion revealed more improvement in periodontal health indicators among the study groups compared with the control group. Healthy life-style choices, such as cessation of cigarette smoking and regular oral self-care, proved to be modifiable determinants of periodontal treatment needs.

The results revealed deficiencies in oral health behaviours and indicated a need for oral health promotion among adults with diabetes. On the other hand, the oral self-care intervention implemented showed that it is possible to further promote periodontal health in this population. To improve the common risk factor approach and patient empowerment, cooperation among all health care professionals involved in diabetes care is highly recommended.
Conceptions of Finnish dentists were surveyed regarding their working conditions, work strain and factors related to it in the spring 1999. The survey was a part of Ministry of Health and Social Affairs' project on occupational health among social and health care workers. The present survey was carried out in co-operation with Department of Oral Public Health, Institute of Dentistry, University of Helsinki, National Research and Development Centre for Welfare and Health, Finnish Dental Association and Finnish Institute of Occupational health. A questionnaire was mailed to 1 in 3 licensed working aged dentists randomly selected from the register of the Finnish Dental Association. Altogether 75.2% (n=1151) responded and the sample is representative in respect with gender and age of the dentists.

Of all respondents 60% worked in public and 40% in private sector. The average working week of the dentists was 35.8 hours. Public sector dentists experienced that their work pace had become considerably strained during the recent years more often than dentists in private sector. They also experienced possibilities to have influence in their working conditions smaller than their private counterparts. The physical burden of the dental work focused at neck and shoulders: only less than 10% of the dentists reported never to suffer from neck and shoulder problems. Used materials caused risks: nearly half of the surveyed reported to have suffered from skin problems in their hands during their working history and every fifth was allergic to some material used in dentistry. Of all the respondents more than half felt themselves to be under some and every seventh under obvious stress. Work seemed to be a stress factor particularly among public sector dentists. Severe burn out could hardly be detected. During the last year 48% of the dentists had been on sick-leave. The frequency of sick-leaves was more prevalent among the public sector dentists.

Dental work seems to further imbed abundant mental and physical stress as well as several occupational health risks. Dentists should actively try in their work, from the beginning of their undergraduate training, to prevent manifestation of these hazards. Organized occupational health care plays a significant role in these activities.
SALIVARY FLOW AND COMPOSITION IN HEALTHY AND DISEASED ADULTS

RANTONEN PANU

The aim of this study was to evaluate different aspects of salivary diagnosis. The specific aims were to investigate salivary flow rates and yeast counts in medicated and unmedicated adult patients, and to investigate one-day hourly pattern, correlations and within-subject variations of salivary viscosities and various salivary proteins in healthy adults. Further aims were to investigate salivary concentrations of cortisol and growth hormone (GH) in saliva and correlations with respective serum concentrations, and to analyze salivary albumin concentrations in patients in an acute geriatric ward and correlate the findings to the patients’ oral health parameters and systemic condition. The results of this study underline the need to take the patients’ gender and systemic medication into account in all salivary diagnoses. The observed within-subject variations in the viscosity of unstimulated saliva, salivary IgA, albumin, amylase and total protein concentrations suggest that these variables are subject to short-term variation. The results also underline the need to accurately specify the time of saliva sampling. Salivary GH concentrations were 1900-fold lower than the values in serum but a positive correlation was found between salivary and serum GH levels. Further, there were significantly higher salivary albumin concentrations and albumin outputs in the frail elderly.

IKÄIHMISTEN SUUN HOITO: OPAS SOSIAALI- JA TERVEYSALAN HENKILÖSTÖLLE

SUOMEN HAMMASLÄÄKÄRILIITON VANHUSTÖRYHMÄ, SUOMEN HAMMASLÄÄKÄRILIITTO ET AL., VALOKUVAT: ANJA AINAMO ET AL.

Lukijalle
"Suu ei ole vain ruuan hienontamispaikka, vaan suu on meillä mukana vihassa ja rakkaudessa. Se on tunne-elämämme tulkki ja mielihyvän lähde." - Asko Kaartinen
Hyvällä suu hoidolla voidaan parantaa ikäähmisten elämänlaatua ja toimintakykyä. Terveellä suulla voi vaivattomasti syödä ja maistella hyviä makuja, laulaa, nauraa ja nauttia elämästä.

Tämä opas on tarkoitettu iäkkäiden parissa työskenteleville avuksi arkipäivän työhön. Opas antaa perustietoa hammas- ja suusairauksista, ohjeita niiden ehkäisemiseksi ja hoitamiseksi sekä kerto suun terveyden merkityksestä osana yleistä terveyttä ja hyvinvointia.

Suun sairauksien ehkäisyssä tärkeää on, että suu, hampaat ja proteesit puhdistetaan päivittäin. Hoitojenkilökunnalla ja omaishoitajilla on tärkeää tehtävä tukea iäkästä puhdistamaan suuna itse päivittäin. Ellei iäkäs enää kykene ylläpitämään hyvää suuhygieniaa, häntä autetaan ja neuvotaan hienovaraisesti. Suun hoito on yksi osa hoitotyötä ja parantaa sen laatu.

Lähtökohtana on palveluja tarvitsevan kuuleminen ja hänen tarpeidensa ja toiveidensa mukainen tavoitteellinen hoito ja palvelu. Jos iäkäs ei itse pysty ilmaisemaan tahtoaan, pyritään hänen etujensa mukaiseen hoitoon yhteisymmärryksessä omaisten kanssa.

Eettisen toiminnan ydin on ikääntyneenä kunnioittava ja arvostava kohtaaminen. Hänen yksilöllisyytensä, itsemäääräämisoikeutensa, henkilökohtainen koskemattomuutensa ja loukkaamattomuutensa otetaan aina huomioon. Hoito ja palvelu perustuvat tietoon ja näyttöön, ja kriteerinä on se, mikä juuri tälle ihmiselle olisi parasta.

### TUMOR NECROSIS FACTOR-[ALPHA] AND MATRIX METALLO-PROTEINASES IN HUMAN PERIODONTAL TISSUE DESTRUCTION

Tervahartiala Taina

Matrix metalloproteinases (MMPs) and tissue-destructive serine proteinases are believed to be the main endogenous and central mediators of the pathologic destruction in periodontitis. These proteinases are collectively able to degrade most, if not all, components of the extracellular matrix (ECM). The present study aimed to expand knowledge of the expression and activation of MMPs and serine proteinases and the regulatory cytokine tumor necrosis factor-a (TNF-a) and its receptor p55 and p75 in human periodontal inflammation.

The expression and activation of MMPs and serine proteinases, especially neutrophil-derived elastase and cathepsin G, were investigated in gingival crevicular fluid (GCF) and tissue and saliva from adult periodontitis (AP), localized juvenile periodontitis (UP), and Sjögren's syndrome (SS) patients, as well as periodontally and otherwise healthy subjects. In the present study in situ hybridization, immunohistochemistry, immunoblotting, and protease activity assays were used.

We demonstrated that periodontitis-affected gingival sulcular epithelium expresses mRNA of many, rather than single, collagenolytic MMPs (MMP-2,-8 and -13) in vivo.
Thus, it seems that gingival sulcular epithelial cells play an important role in both the regulation and synthesis of collagenolytic matrix-degrading proteinases. We further extended the view that MMP-1 is the predominant collagenase in UP GCF and MMP-8 in AP GCF and saliva. In addition, we demonstrated the expression of MMP-7 and -14 and cathepsin G, potential activators of the collagenolytic proMMPs, in AP GCF and gingiva. Furthermore, we demonstrated that TNF-a may up-regulate the multiple collagenolytic MMPs through binding to p55 TNF-R in vivo. The relatively low level of the endogenous MMP inhibitor TIMP-1 in AP GCF supports the concept that imbalance between endogenous inhibitor and MMPs occurs in periodontitis. Our clinical and biochemical findings indicated that SS has no effect on periodontitis. Thus, these findings demonstrated increased in vivo expression of collagenolytic and their activator MMPs, which can act in network, in periodontitis.

MATRIX METALLOPROTEINASES IN PULPITIS, CHRONIC APICAL PERIODONTITIS AND ODONTOGENIC JAW CYSTS

WAHLGREN JAANA

Matrix metalloproteinases (MMPs) form an enzyme family capable of degrading almost all extracellular matrix (ECM) and basement membrane (BM) components. They play an important role in normal tissue remodelling and growth, as well as in many destructive pathological conditions such as inflammation, tumour growth and metastasis. The expression of MMP-8 in cultured human mature pulpal cells and odontoblasts was evaluated with polymerase chain reaction-method (PCR). Mesenchyme-derived cells, pulp tissue cells and odontoblasts expressed MMP-8, which was down-regulated by transforming growth factor (TGF-) in these cell cultures. Immunohistochemical staining revealed MMP-8 protein in the odontoblasts. These results suggest that MMP-8 may participate in dentin matrix organization during dentin formation.

The presence of MMP-8 in inflammatory pulpal and periapical tissues and in root-canal exudates during root-canal treatment was further studied. Using immunohistochemistry, MMP-8 staining was detected in polymorphonuclear leukocytes (PMNs), macrophages and plasma cells in both pulpal and periapical lesions. MMP-8 has evidently a role in pulpal and periapical inflammation. MMP-8 levels in periapical exudate were significantly reduced during root canal treatment.

Measuring MMP-8 levels in periapical exudate may be used as a biochemical indicator/molecular marker to monitor the inflammatory activity and success in root canal treatment.

Odontogenic keratocyst (KC) has special characteristics; its epithelium proliferates rapidly and detaches easily from connective tissue stroma, it recurs easily and forms daughter cysts. With this background, the differential expression of MMPs in odontogenic cysts was studied. The results revealed colocalization of MMP-2 and MMP-13 with laminin-5 (Ln-5) 2-chain in the KC basement membrane zone indicating that especially these MMPs may be responsible for the epithelial detachment of KC.

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In all odontogenic cysts, MMP-8 protein was detected not only in PMNs, but also macrophages and plasma cells by immunohistochemistry. *In situ* hybridization showed MMP-8 mRNA expression in the plasma cells of follicular cyst (FC). MMP-13 expression was also localized to plasma cells in periapical lesions, KCs and plasmacytoma (PLC) specimens by both immunohistochemical staining and *in situ* hybridization.

Cultured multiple myeloma cells showed that the expression of MMP-8 and MMP-13 was enhanced by phorphol-12-myristate-13-acetate (PMA) and heparin combined with different cytokines like interleukin-6 (IL-6).

Overall, these results show that MMPs play an important role in ECM and BM remodelling and destruction during dentin formation, inflammatory processes of pulpitis, apical periodontitis, and enlargement of odontogenic jaw cysts, as well as reflect the special characteristics of them.

**ELECTRONIC MATERIAL**

**HYPODONTIA**

ARTE SIRPA, PIRINEN SINIKKA

**VISUAL ENDODONTICS & TRAUMATOLOGY**

HAAPASALO MARKUS

**ARTICLES IN ENGLISH**

**SELF-REPORTED STRESS AMONG MULTIPROFESSIONAL MEDIA PERSONNEL**

AHILBERG JARI, KÖNÖNEN MAUNO, RANTALA MIKKO, SARNA SEPPO, LINDHOLM HARRI, NISSINEN MAUNU, KAARENTO KARI, SAVOLAINEN ASLAK

BACKGROUND: Recent research shows increasing rates of occupational stress and stress-related disorders. OBJECTIVE: To study self-reported stress and its association with work (work duty, working hours and shift work), sick leave and gender among multiprofessional media personnel. METHODS: We used a questionnaire study among
30- to 55-year-old radio and TV broadcasting employees (n = 1339). RESULTS: Stress was felt 'rather much' by 18% and 'very much' by 6%. Females reported stress (P < 0.05) and absence from work (P < 0.05) more often than males. The probability of having 'rather much' or 'very much' stress was significantly associated with self-reported overtime (P < 0.01) and the amount of reported sick leave (P < 0.05) CONCLUSION: Self-reported overtime and sick leave appear to be associated with higher level of self-reported stress, regardless of age, gender or work duty.

MAXIMAL BITE FORCE AND ITS ASSOCIATION WITH SIGNS AND SYMPTOMS OF TMD, OCCLUSION, AND BODY MASS INDEX IN A COHORT OF YOUNG ADULTS

AHLBERG JARI, KOVERO OUTI, HURMERINTA KIRSTI, ZEPA INTA, NISSINEN MAUNU, KÖNÖNEN MAUNO

The purpose of this population-based cohort was to measure maximal bite force (MBF) in the molar and incisal regions and to examine whether MBF was associated with TMD, gender, occlusion (in terms of overjet, overbite, and total number of occluding contacts), and body mass index (BMI). MBF in the molar and incisal regions was measured using a calibrated method in 384 (196 males, 188 females) and 357 (181 males, 176 females) subjects, respectively. Two attempts in each region (right molar, left molar, and incisal) were made in random order. The subjects completed a multiple-choice questionnaire including subjective symptoms of TMD and were subsequently clinically examined. Helkimo's clinical dysfunction index and BMI were calculated. The mean MBF value in the molar region was significantly higher in males (878 N, SD 194) than in females (690 N, SD 175) (p < 0.001). The incisal forces were 283 N (SD 95) and 226 N (SD 86) (p < 0.001), respectively. According to multiple linear regression, TMJ discomfort was significantly negatively associated with MBF in the molar region (p < 0.05) and overjet was significantly negatively associated with maximal incisal bite force (p < 0.05). No significant associations between MBFs and body mass were found. The results demonstrate that in a population-based cohort of young adults signs, and symptoms of TMD and studied occlusal factors, unlike body mass, associate independently with MBF.

REPORTED BRUXISM AND STRESS EXPERIENCE IN MEDIA PERSONNEL WITH OR WITHOUT IRREGULAR SHIFT WORK

AHLBERG KRISTIINA, AHLBERG JARI, KÖNÖNEN MAUNO, PARTINEN MARKKU, LINDHOLM HARRI

A standardized questionnaire was mailed to all employees of the Finnish Broadcasting Company with irregular shift work (n = 750) and to an equal number of randomly
selected controls with regular 8-hour daytime work. The aim was to analyze whether irregular shift work, workload in terms of weekly working hours, dissatisfaction with current workshift schedule, health-care use, age and gender were associated with self-reported bruxism and experienced stress. The response rates were 58.3% (n = 874, 53.7% men) overall, 82.3% (n = 617, 56.6% men) for irregular shift workers and 34.3% (n = 257, 46.7% men) for the regular daytime work group. Those with irregular shifts were more often dissatisfied with their current workshift schedule than those in daytime work (25.1% versus 5.1%, P < 0.01). Irregular shift work was significantly associated with more frequent stress (P < 0.001), but not with self-reported bruxism. Workers dissatisfied with their current schedule reported both bruxism (P < 0.01) and stress (P < 0.001) more often than those who felt satisfied. In multivariate analyses, frequent bruxism was significantly associated with dissatisfaction with current workshift schedule (P < 0.05), number of dental visits (P < 0.05), and visits to a physician (P < 0.01), and negatively associated with age (P < 0.05), while severe stress was significantly positively associated with number of visits to a physician (P < 0.001). It was concluded that dissatisfaction with one's workshift schedule and not merely irregular shift work may aggravate stress and bruxism.

DEVELOPMENTAL DENTAL DEFECTS AFTER THE DIOXIN ACCIDENT IN SEVESO

ALALUUSUA SATU, CALDERARA PIER, GERTHOUX PIER MARIO, LUKINMAA PIRJO-LIISA, KOVERO OUTI, NEEDHAM LARRY, PATTerson DONALD G., TUOMISTO JOUKO, MOcARELLI PAOLO

MATRIX METALLOPROTEINASE -2, -8, -9, AND -13 IN GINGIVAL CREVICULAR FLUID OF SHORT ROOT ANOMALY PATIENTS

APAJALAHTI SATU, SORSA TIMO, INGMAN TUULA

The aim of the present observational study was to identify and characterize matrix metalloproteinase (MMP) -2, -8, -9, and -13 in gingival crevicular fluid (GCF) of patients with short root anomaly (SRA). GCF samples collected from affected maxillary central incisors and premolars of five SRA patients and five systemically and periodontally healthy controls were analysed using the zymographic technique for gelatinase A and B (MMP-2 and -9) and by Western blot for collagenase -2 and -3 (MMP-8 and -13). SRA GCF revealed MMP-9 (30 per cent of the total gelatinolytic activity), of which 18 per cent was in 90 kDa proform and 12 per cent in 71-82 kDa active form. Moreover, high-molecular weight complexes (37 per cent) and low-molecular size fragmented (33 per cent) gelatinolytic enzymes were detectable. No MMP-8 or -13 immunoreactivities existed. These results may suggest that activation and complex formation of MMP-9 is
characteristic of SRA GCF. From the findings it may be assumed that the GCF of SRA teeth has low collagenolytic resorptive or pathological activity.

THE IN VIVO LEVELS OF MATRIX METALLOPROTEINASE-1 AND -8 IN GINGIVAL CREVICULAR FLUID DURING INITIAL ORTHODONTIC TOOTH MOVEMENT

APAJALAHTI SATU, SORSA TIMO, RAILAVO S., INGMAN TUULA

Orthodontic force induces biochemical responses in the periodontal ligament (PDL), but the matrix metalloproteinase (MMP)-dependent molecular mechanisms in orthodontically induced periodontal remodeling have remained unclear. Previous studies indicate that mechanical stress induces MMP-1 production in human PDL cells in vitro. We tested the hypothesis whether the in vivo levels, molecular forms, and degree of activation of MMP-1 and MMP-8 in gingival crevicular fluid (GCF) reflect an early stage of orthodontic tooth movement. Molecular forms of MMP-1 and MMP-8 were analyzed by Western blot, and MMP-8 levels by quantitative immunofluoro-metric assay (IFMA). The results showed that GCF MMP-8 levels for orthodontically treated teeth were significantly higher at 4-8 hrs after force application than before activation, and when compared with the control teeth (p < 0.05). Analysis of our data indicates that the cells within the periodontium are up-regulated to produce MMP-8, and the increased expression and activation of GCF MMP-8 reflect enhanced periodontal remodeling induced by orthodontic force.

SPOTLIGHT ON NATURALLY ABSORBABLE OSTEOFIXATION DEVICES

ASHAMMAKHI NUREDDIN, SUURONEN RIITTA, TIAINEN JOHANNA, TÖRMÄLÄ PERTTI, WARIS TIMO

The practice of using implants is growing day by day, and more foreign materials are being inserted for various indications. The field of implantology thus deserves intensive research and careful evaluation of results. Solutions to overcome current problems and risks are necessary. It has taken a long time to arrive at where we are now. Bioabsorbable devices were explored in the 1960s for surgical bone fixation. Failures were followed by changes in ways of thinking and innovations. Improvements in the strength properties and biocompatibility were achieved. Bioabsorbable polymeric materials such as high-molecular-weight polymers were used and also reinforced with other material or, more recently, by self-reinforcement to produce small yet strong devices. New generations of implants include those that contain bioactive substances such as antibiotics and growth factors. Developments in bioabsorbable materials continue to accommodate the new way of thinking brought about by the emergence of the field of tissue engineering. Surgeons, conversely, are also inventing new surgical techniques and methods to exploit the plastic
and bioabsorbability properties of these materials for the better future of our patients.
Such a multidisciplinary approach that involves surgeons and materials scientists should
help to find solutions to the current limitations of these devices.

EFFICACY OF CHLORHEXIDINE- AND CALCIUM HYDROXIDE-CONTAINING MEDICAMENTS AGAINST ENTEROCOCCUS FAECALIS IN VITRO

BASRANI BETTINA, TJÄDERHANE LEO, SANTOS J. MIGUEL, PASCON ELIZEU, GRAD HELEN, LAWRENCE HERENIA, FRIEDMAN SHIMON
Oral surgery, oral medicine, oral pathology, oral radiology, and endodontics. 96: 618-624, 2003

OBJECTIVE: We sought to assess the efficacy of chlorhexidine (CHX) and calcium hydroxide, Ca(OH)2, against Enterococcus faecalis in vitro. STUDY DESIGN: The effect of CHX (0.2% and 2% in gel or solution) and Ca(OH)2 (alone or with 0.2% CHX gel) was evaluated by using the agar diffusion test and an in vitro human root inoculation method, to measure zone of inhibition or bacterial growth with optical density analysis, respectively. For optical density analysis, samples from infected root canals were collected after 7 days of medication and were cultured for 24 hours in brain-heart infusion to detect viable bacteria. RESULTS: In the agar diffusion test, CHX was effective against E faecalis in a concentration-dependent fashion, but Ca(OH)2 alone had no effect. In the root canal inoculation test, CHX was significantly more effective against E faecalis than Ca(OH)2 was (P < .05), but there were no significant differences between the modes of medication or concentrations of CHX. CONCLUSIONS: CHX is effective against E faecalis in vitro. Further in vivo studies are needed to confirm the value of CHX in clinical treatment.

PULMONARY TRYSIN-2 IN THE DEVELOPMENT OF BRONCHOPULMONARY DYSPLASIA IN PRETERM INFANTS

CEDERQVIST KATARIINA, HAGLUND CAJ, HEIKKILÄ PÄIVI, SORSA TIMO, TERAHARTIALA TAINA, STENMAN ULF-HÅKAN, ANDERSSON STURE

OBJECTIVES: In the preterm infant, lung injury can lead to irreversible tissue destruction and abnormal lung development. We examined whether pulmonary trypsin, a potent matrix-degrading serine proteinase and proteinase-cascade activator, is associated with the development of bronchopulmonary dysplasia (BPD) in preterm infants. METHODS: Samples of tracheal aspirate fluid were collected from 32 intubated preterm infants during their first 2 postnatal weeks. The presence and molecular forms of trypsin in tracheal aspirate fluid samples were analyzed by zymography and Western blotting. The concentrations of trypsinogen-1 and -2 and tumor-associated trypsin inhibitor were measured by immunofluorometry. For examining the expression of trypsin-2 in lung tissue, immunohistochemistry was performed on autopsy specimens of fetuses, of preterm
infants who died from respiratory distress syndrome or BPD, and of term infants without lung injury. RESULTS: In infants who subsequently developed BPD (n = 18), we detected significantly higher concentrations of trypsinogen-2 during postnatal days 5 to 10 compared with those who survived without it. There was no difference in trypsinogen-1 concentrations. Tumor-associated trypsin inhibitor concentrations were significantly lower in infants who needed mechanical ventilation for >1 week. Immunohistochemistry demonstrated that trypsin-2 was predominantly expressed in bronchial and bronchiolar epithelium. In 2 preterm infants who died from prolonged respiratory distress syndrome, trypsin-2 was also expressed in vascular endothelium. CONCLUSIONS: The levels of trypsinogen-2 are higher during postnatal days 5 to 10 in infants who subsequently develop BPD. The results suggest that high levels of pulmonary trypsin-2 may be associated with the development of BPD. This raises the possibility that therapy with exogenous proteinase inhibitors might prevent the development of BPD in preterm infants with respiratory distress.

SUBGINGIVAL MICROFLORA IN TURKISH PATIENTS WITH PERIODONTITIS

DOGAN BASAK, ANTINHEIMO JOHANNA, CETINER DENIZ, BODUR AYSEN, EMINGIL QÜLNUR, BUDUNELI ERALP, UYGUR CEM, FIRATLI ERHAN, LAKIO LAURA, ASIKAINEN SIRKKA, MÜLLER A.

BACKGROUND: No information exists on periodontitis-associated subgingival microbiota from Turkey. We determined the occurrence, interspecies relationships, and clonal characteristics for a group of periodontal bacteria in a Turkish study population. METHODS: Subgingival microbial samples were obtained from patients with localized (LAGP, N = 18) or generalized (GAgP, N = 17) types of aggressive periodontitis, generalized chronic periodontitis (GCP, N = 14), and non-periodontitis subjects (N = 20). Culture methods were used to recover 6 periodontal bacterial species and yeasts, and a polymerase chain reaction technique was used to detect Actinobacillus actinomycetemcomitans and Porphyromonas gingivalis. Intraspecies characterization of A. actinomycetemcomitans was carried out by serotyping and genotyping. RESULTS: All species, except for Micromonas micros (formerly Peptostreptococcus micros) occurred more frequently (P < 0.05) in periodontitis than non-periodontitis subjects. Detection frequencies for Tannerella forsythensis (formerly Bacteroides forsythus) and Campylobacter rectus differed among the periodontitis subgroups; the lowest frequency occurred in LAgP. The mean proportions of A. actinomycetemcomitans, P. gingivalis, and C. rectus were higher (P < 0.008) in GAgP than in non-periodontitis subjects. Significant positive associations were seen between 7 of the 22 possible combinations (P < 0.05). A. actinomycetemcomitans serotype c (34%) and non-serotypeable isolates (34%) were the most common antigenic types among the 305 strains analyzed. Eleven arbitrarily primed (AP)-PCR genotypes were distinguished among 273 isolates from 29 subjects. Yeasts were found in 23% of the 69 subjects. CONCLUSIONS: The results on
the Turkish study population were generally in line with earlier reports on the occurrence
and interspecies relationships of certain bacteria in periodontitis. However, A.
actinomycetemcomitans was not overrepresented in LAgP, and the serotype distribution
resembled that reported from the East. The high frequency of non-serotypeable isolates
suggests local characteristics of the species.

TISSUE REACTIONS OF SUBCUTANEOUSLY IMPLANTED MIXTURE OF
EPSILON-CAPROLACTONE-LACTIDE COPOLYMER AND TRICALCIUM
PHOSPHATE: AN ELECTRON MICROSCOPIC EVALUATION IN SHEEP

EKHOLM MARJA, HIETANEN JARKKO, TULAMO RIITTA-MARI, MUHONEN
JARKKO, LINDQVIST CHRISTIAN, KELLOMÄKI MINNA, SUURONEN RIITTA

Biodegradable polymers, mainly derivates of α-hydroxy acids, are widely used today in
oral- and maxillofacial surgery, orthopedics, and other fields of surgery. These
biomaterials are well tolerated by living tissue and fracture fixation devices made of
polylactic or polyglycolic acid are clinically widely used today. Still, there are some
problems in application of biodegradable polymers. Abacterial inflammatory reactions
have been noticed after the clinical introduction of these devices. Both swelling and pain
at the site of implantation have also been reported. The etiology of this inflammatory
reaction is still unknown, despite the numerous studies. Therefore, the aim of the present
study was to further characterize this inflammatory reaction in detail, by
electronmicroscopy. We prepared a mixture of ε-caprolactone–lactide copolymer and
tricalcium phosphate and placed it in the dermis in 12 sheep. Follow-up times were 9, 14,
24, and 52 weeks. We found that the mixture caused a mild inflammatory reaction. There
were no signs of cell damage. Fibroblasts, macrophages, and eosinophils were found
adjacent to the copolymer. The mixture is easy to handle and can be moulded into
different shapes in room temperature. The results encourage us to continue our studies to
develop a filling material for bone defects.

INHIBITION OF MATRIX METALLOPROTEINASE-14 IN OSTEOSARCOMA
CELLS BY CLODRONATE

HEIKKILÄ PIA, TERONEN OLLI, HIRN MARTTI, SORSA TIMO,
TERVAHARTIALA TAINA, SALO TUULA, KONTTINEN YRJÖ, HALTTUNEN
TUULA, MOILANEN MERJA, HANEMAAIJER ROELAND, LAITINEN MINNA
Journal of surgical research 111: 45-52, 2003

BACKGROUND: Bisphosphonates reduce the bone metastasis formation and
angiogenesis but the exact molecular mechanisms involved are unclear. Progelatinase A
(proMMP-2; 78 KDa) is activated up during the tumor spread and metastasis by a cell
surface-associated matrix metalloproteinase (membrane-type matrix metalloproteinase
MATERIAL AND METHODS: We evaluated the effects of a bisphosphonate (clodronate) on MT1-MMP mRNA expression and protein production, catalytic activity and proteolytic activation of proMMP-2 by cultured human MG-63 osteosarcoma cells. RESULTS: Clodronate, at therapeutically attainable noncytotoxic concentrations, dose-dependently inhibited phorbol myristic acetate (PMA)-induced proteolytic activation of proMMP-2 by human MG-63 osteosarcoma cells. Clodronate also downregulated the PMA-induced expression of MT1-MMP mRNA and protein production in human MG-63 osteosarcoma cells, as evidenced by Northern analysis and fluorescent immunohistochemistry. Furthermore, clodronate inhibited directly and dose-dependently MT1-MMP activity, and the MT1-MMP inhibition by clodronate was reduced in the presence of an increased (5 mM) Ca(2+) concentrations when compared to physiological (1 mM) Ca(2+) concentrations. CONCLUSION: We conclude that (1) the extracellular/cell-associated mechanism of bisphosphonate involves inhibition of MT1-MMP catalytic activity eventually by chelation, and that (2) intracellular mechanism involves downregulation of induced MT1-MMP mRNA and protein expression. The inhibition and downregulation of MT1-MMP by clodronate can be related to their ability to reduce MG-63 osteosarcoma cell invasion and spread. These findings may, at least in part, explain at molecular level the antitumor and ant boneresorption activities of clodronate observed in clinical studies.

DENTAL INDICES AND THEIR IMPACT ON TARGETING OF DENTAL PREVENTION, PERIODONTAL AND FILLING THERAPY IN YOUNG ADULTS UNDERGOING SUBSIDISED PUBLIC DENTAL CARE.

HELMINEN SEPO, VEHKALAHTI MIIRA
Community dental health. 20: 100-105, 2003

OBJECTIVE: To describe the dental health of young adults undergoing subsidised public dental care and evaluate the amount and targeting of actual dental prevention, filling and periodontal therapy, and the length of proposed check-up intervals in relation to dental health indices. BASIC RESEARCH DESIGN: Data on dental prevention, periodontal and filling therapy for the age groups 19- to 36-years in 1999 were analysed in relation to dental indices. SETTING: Public dental clinics of the Helsinki City Health Department. PARTICIPANTS: In total, 25,657 patients whose check-ups were conducted by 139 dentists. MAIN OUTCOME MEASURES: Length of proposed check-up intervals, actual number of visits, actual time used for repeated dental prevention, periodontal and filling therapy and their relation to caries and periodontal indices. RESULTS: The mean DMFT for all patients was 11.8 and DT 1.6; 6% had deep (> or = 4 mm) periodontal pockets and 70% had calculus with no pockets. Repeated dental prevention was not given to 77% of patients with calculus and DM > or = 3, but given to 19% of those with calculus and DT = 0. Dental indices reflected proposed individual check-up intervals and repeated dental prevention actually given. The average length of proposed check-up intervals was 17.8 months. Of all fillings, 13% were done for DT = 0 patients. CONCLUSIONS: Dentists' dental prevention practices for young adults showed under use of preventive actions. The
value of the DT and CPITN indices as a measure of treatment needs of caries and periodontal disease in young adults seemed to be minor.

**DOES CARIES PREVENTION CORRESPOND TO CARIES STATUS AND ORTHODONTIC CARE IN 0- TO 18-YEAR-OLDS IN THE FREE PUBLIC DENTAL SERVICE**

**HELMINEN SEppo, VEHKALAHTI MIIRA**  
Acta odontologica Scandinavica 61: 29-33, 2003

The aim of the study was to evaluate the coverage of and time used for caries preventive actions by patient and by dentist's characteristics in relation to caries status and orthodontic treatments in patients from birth to 18 in public dental care in Helsinki City Health Department, Finland. Data on caries prevention for the age groups 0- to 18-year-olds in 1999 were analyzed in relation to patient age, caries status, orthodontic care, and dentist's characteristics. Our study comprised a total of 48,040 patients treated by 140 dentists. Main outcome measures were the coverage of and time used for repeated caries prevention performed during visits following the check-up visit. Nine percent of those under age 6 received repeated caries prevention, 29% of the 6- to 15-years-olds and 24% of the 16- to 18-year-olds. Nineteen percent in the no-caries group (DMFT/dmft = 0) and 36% in the high-caries group (DMFT/dmft > 0 and DT + dt > or = 3) received repeated caries prevention. The average time a dentist used in repeated caries prevention was 3.6 min (s 3.1: median 2.8; range 0.2-15.4 min) for those in the no-caries and 8.1 (s 6.2; median 7.3; range 0.0-31.8 min) for those in the high-caries group. In each category of caries status, the average time used for repeated caries prevention was shorter for those not under orthodontic treatment. In conclusion, the variation in dentists' caries-preventive treatment practices is wide showing both over- and underuse of caries-preventive actions as judged by needs of patients.

**A 5-YEAR FOLLOW-UP OF SIGNS AND SYMPTOMS OF TMD AND RADIOGRAPHIC FINDINGS IN THE ELDERLY**

**HILTUNEN KAIJA, PELTOLA JAAKKO, VEHKALAHTI MIIRA, NÄRHI TIMO, AINAMO ANJA**  

**PURPOSE:** The aim was to clarify the associations among subjective symptoms, clinical signs of temporomandibular disorders (TMD), and radiographic findings in the mandibular condyles of elderly people during a 5-year follow-up. **MATERIALS AND METHODS:** As part of a comprehensive medical survey of a random sample born in 1904, 1909, and 1914 (Helsinki Aging Study), 364 subjects living in Helsinki participated in the dental part of the examination during 1990 and 1991; after 5 years, 103 of these were reexamined. Comprehensive data on TMD were available for 94 subjects, and
radiographic data were available for 88. TMD were assessed by Helkimo's anamnestic and clinical indices, and radiographic status was assessed by panoramic radiographs.

RESULTS: During the 5-year follow-up, reported anamnestic symptoms of TMD for men changed little (9%); among women, the change from baseline was 42%. When the unchanged indices were compared, the gender difference was obvious. At baseline, 5% of the women, but no men, had severe signs (clinical index III) of TMD. At the end of follow-up, none showed severe signs. Comparison of radiographic findings between baseline and follow-up showed no differences, nor did differences appear in associations between radiographic findings and anamnestic or clinical indices. CONCLUSION: During the 5-year follow-up, signs and symptoms of TMD in these elderly individuals became milder or vanished. The radiographic status of the condyles remained stable, and no association appeared between radiographic findings and signs and symptoms of TMD.

ACTIVATION OF MATRIX METALLOPROTEINASE-8 BY MEMBRANE TYPE 1-MMP AND THEIR EXPRESSION IN HUMAN TEARS AFTER PHOTOREFRACTIVE KERATECTOMY

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Investigative ophthalmology & visual science 44 (6): 2550-2556, 2003

PURPOSE: Matrix metalloproteinases (MMPs) play a central role in the wound-healing process. The objective of this study was to identify and characterize the levels and molecular forms of human tear fluid collagenase-2 (MMP-8) and membrane type 1-MMP (MT1-MMP or MMP-14) in patients who had undergone excimer laser photorefractive keratectomy (PRK) and in healthy subjects. Whether MT1-MMP activates pro-MMP-8 was also determined. METHODS: Tear fluid samples were collected with scaled and blunted microcapillaries from healthy control subjects and, on the second postoperative day, from patients who had undergone PRK. Time and the volume collected were registered. Molecular forms and levels of pro and active MMP-8 and MT1-MMP in these samples were determined by Western immunoblot analysis, quantitated by computer scanning. The concentration of MMP-8 was also determined by immunofluorescence assay. The conversion of pure human polymorphonuclear neutrophil (PMN) pro-MMP-8 to the active form by the catalytic domain of MT1-MMP was studied by Western immunoblot analysis. RESULTS: The tear fluid flow was increased after PRK. Tear fluid flow-corrected excretion of MMP-8 was significantly higher in PRK-treated patients, as assessed by immunofluorescence assay and quantitative Western immunoblot analysis. The major MMP-8 species detected in tears of both PRK-treated patients and healthy control subjects represented latent and active 75- and 65-kDa highly glycosylated MMP-8 isoforms. The less-glycosylated 45- to 55-kDa MMP-8 isoform was not detectable. Tear fluid flow-corrected secretion of MT1-MMP was significantly higher in PRK-treated patients. Soluble 80-kDa MT1-MMP immunoreactivities were detected in tears of both healthy control subjects and PRK-treated patients, and may represent a complex captured by tissue inhibitor of metalloproteinase (TIMP)-2. Human PMN pro-MMP-8 was
converted to the active form by MT1-MMP, and TIMP-2 prevented this activation. CONCLUSIONS: Corneal renewal eventually occurs at a high rate and is affected by the rate of corneal collagen and other matrix protein breakdown. Accordingly, tear fluid MMP-8 and MT1-MMP levels were shown to be constantly high in normal subjects. With PRK, a fast wound-healing process was associated with even higher MMP-8 and MT1-MMP levels and their activation. The results suggest a role for a MMP-8 and MT1-MMP network in the corneal wound-healing cascade. Furthermore, MT1-MMP (MMP-14) seems to activate pro-MMP-8.

RELATIONSHIP BETWEEN DENTAL HEALTH AND 10-YEAR MORTALITY IN A COHORT OF COMMUNITY-DWELLING ELDERLY PEOPLE

HÄMÄLÄINEN PI, MEURMAN JUKKA H., KESKINEN MARJA, HEIKKINEN EINO

Dental examinations were carried out as part of the Evergreen project, which focuses on functional capacity and health among the elderly residents of the city of Jyväskyla, central Finland. Dental status was examined in 1990 for the whole population born in 1910 (n = 226). Mortality data were collected over 10 yr. The aim of the study was to assess the possible role of dental health as a predictor of mortality. The Kaplan-Meier method was used to analyse survival curves and Cox regression models, with the number of chronic conditions and self-rated health used as covariates in analysing the risks of death. The results showed that the more teeth or filled teeth a subject had, the smaller was their risk for death. The effect of missing teeth was significant after adjusting for the general health variables. Thus, our results support the hypothesis that poor dental health is linked to increased mortality among elderly people.

XEROSTOMIC MEDICATIONS AND ORAL HEALTH: THE VETERANS DENTAL STUDY (PART I)

JANKET SOK-JA, JONES JUDITH, RICH SHARRON, MEURMAN JUKKA H., GARCIA RAUL, MILLER DONALD
Gerodontology 20 (1) : 41-49, 2003

OBJECTIVES: To quantify the adverse effects of the number of xerostomic medications on dental caries, oral mucosa, and periodontal disease. DESIGN: Secondary analysis of a cross-sectional study of the Veterans Dental Study. SETTING: Four New England area VA outpatient clinics. SUBJECTS: The sample consists of 345 male veterans participating in The Veteran's Dental Study who also had pharmacy records. MAIN OUTCOME MEASURES: Oral health data included total surfaces of coronal caries, a modification of the root caries index, mean oral mucosa scores, and Community Periodontal Index of Treatment Need (CPITN). Oral health parameters were measured
and recorded in clinical dental examinations. EXPOSURES: Intake of xerostomic medications 14-385 days prior to the dental examination. STATISTICAL ANALYSES: The relationships between exposure and outcome were analyzed via linear and logistic regression methods adjusting for possible confounding factors such as disease burden index, alcohol consumption, dental care, and smoking status. RESULTS: Veterans who were taking at least one xerostomic medication were almost three times more likely to have mean mucosa scores in the worst 25 percentile than veterans taking no xerostomic medications, OR = 2.63 (confidence interval [CI] 1.34, 5.16, p = 0.03) after adjusting for age, number of teeth, disease burden index, income, smoking and alcohol use. Participants who were taking at least one xerostomic medication experienced higher but non-significant increases in coronal (OR = 1.21; CI. 0.66, 2.25) and root caries (OR = 1.10 CI. 0.54, 2.24) measured by numbers of total decayed surfaces. Conclusion: There were significant deleterious effects of xerostomic medications on oral mucosa. However, xerostomic medications do not appear to increase coronal caries, or periodontal index measured by CPITN among ambulatory, community dwelling participants who were able to perform routine preventive oral care.

ORAL HEALTH PROMOTION AMONG ADULTS WITH DIABETES IN FINLAND

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Community dentistry and oral epidemiology 31: 447-453, 2003

OBJECTIVES: In the present community trial, changes in oral health among adults with diabetes in Finland were assessed in three differing intervention groups and in a control group. The goal of intervention was to promote periodontal health. METHODS: The study population comprised of 120 adults with diabetes, who were regular patients at the Salo Regional Hospital Diabetes Clinic in Salo, Finland. All underwent periodontal examination in 1999 and 2001. The percentage of dropouts was 4%. Outcome measures were visible plaque, presence of calculus, and the Community Periodontal Index of Treatment Needs (CPITN) index calculated for each tooth separately. Oral-health-related factors were determined by a questionnaire. Intervention based on the recommended treatment interval was carried out in the following groups: diabetes nurse-letter-reminder group (n = 26), diabetes nurse-reminder group (n = 31), letter-reminder group (n = 30), and a control group (n = 28). RESULTS: A significant decrease occurred in the visible plaque index between 1999 and 2001 in all groups, and in calculus index in the diabetes-nurse-reminder group and in the letter-reminder group. During the study period, only in the control group, the CPITN index codes 3 and 4, calculated for each tooth separately, increased. CONCLUSION: These positive results emphasize the potential of existing health-care actions for promoting periodontal health. With minimal recourse demands, it was possible to increase oral health behaviors and periodontal health among patients with diabetes.
PERIODONTAL TREATMENT NEEDS IN A FOLLOW-UP STUDY AMONG ADULTS WITH DIABETES IN FINLAND

KARIKOSKI AIJA, MURTOMAA HEIKKI

We assessed changes in periodontal treatment needs among patients with diabetes and the risk factors involved in this phenomenon. The sample consisted of 120 dentate subjects, all of whom were regular patients at the Salo Regional Hospital Diabetes Clinic. They underwent periodontal examination in 1999 and were re-examined in 2001. The drop-out rate was 4%. Clinical periodontal examination included identification of visible plaque, the presence of calculus, and use of the Community Periodontal Index of Treatment Needs (CPITN) index. Diabetes-related factors consisted of information about duration of diabetes, complications, and HbA1c values. Oral health-related factors were collected by questionnaire. The CPITN index proved to be insensitive to change. Pathological pockets (CPITN 3 or 4) were found in 80% of subjects (n = 115) and 48% of sextants (n = 627); in 1999, the corresponding rates were 77% and 49%. The tooth-based individual CPITN index (code 3 or 4) revealed periodontal deterioration in 38 patients. Smoking and infrequent interdental cleaning were significant factors explaining periodontal deterioration in logistic regression. Risk factors should be taken into account when planning prevention, treatment, and supportive periodontal therapy strategies. In diabetes care, the common risk factor approach can be implemented to promote oral health among individuals with diabetes.

DIFFERENCES BETWEEN TOOTH STIMULATION AND CAPSAICIN-INDUCED NEUROGENIC VASODILATATION IN HUMAN GINGIVA

KEMPPAINEN PENTTI, AVELLAN NILS, HANDWERKER H. O., FORSTER C.

Animal experiments have shown that the application of capsaicin to oral mucosa leads to a neurogenic inflammation associated with blood flow elevations in gingivomucosal tissues. In this investigation, we measured the tooth stimulation and capsaicin-evoked blood flow responses in maxillary gingiva in humans to study whether axon-reflex-mediated vasodilatation crosses the midline of the maxilla. The vasoactive reactions were mapped by laser Doppler imaging. Unilateral stimulation of alveolar mucosa and attached gingiva by capsaicin evoked a distinct neurogenic vasodilatation in ipsilateral gingiva, which rapidly attenuated at the midline. Capsaicin stimulation of alveolar mucosa provoked clear inflammatory reactions. In contrast to capsaicin stimuli, tooth stimulation produced symmetrical vasodilatations bilaterally in the gingiva. The ipsilateral responses were significantly smaller during tooth stimulation than during capsaicin stimuli. Analysis of these data suggests that capsaicin-induced inflammatory reactions in gingivomucosal tissues do not cross the midline in the anterior maxilla. The enhanced
reaction found during stimulation of alveolar mucosa indicates that alveolar mucosa is more sensitive to chemical irritants than attached gingiva.

CHANGES IN GINGIVAL CREVICAL FLUID MATRIX METALLOPROTEINASE-8 LEVELS DURING PERIODONTAL TREATMENT AND MAINTENANCE

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Journal of periodontal research. 38: 400-404, 2003

OBJECTIVES: The aim of this study was to investigate the effect of scaling and root planing (SRP) and the maintenance phase of treatment on the gingival crevicular fluid (GCF) matrix metalloproteinase-8 (MMP-8) levels. MATERIALS AND METHODS: Clinical measurements and GCF samples were taken from four sites in 20 adult periodontitis patients before and after SRP and during a 3-month maintenance phase of treatment. MMP-8 levels were measured from GCF samples by time-resolved immunofluorometric assay (IFMA) with monoclonal antibodies. RESULTS: SRP improved the clinical indices as would be predicted, 6.1 mm (SD = 1.4) at baseline compared with 4.3 mm (SD = 1.6) post-treatment (P < 0.001). Attachment level (AL) reduced but not significantly between these two visits 13.4 mm (SD = 2.4) compared with 12.8 mm (SD = 2.4) (P < 0.08) post therapy. GCF MMP-8 levels reduced after initial treatment from 33.8 micro g/30 s sample to 23.5 micro g/30 s, which just failed to reach statistical significance (P = 0.07). However, when MMP-8 levels were expressed as a concentration, the differences following initial therapy were significant (54.1 ng/ micro L at baseline compared with 34.2 ng/micro L post treatment; P < 0.005). The difference, however, between the baseline MMP-8 levels (33.8 ng/30 s) and the final visit (16 ng/30 s) following maintenance was markedly significant (P < 0.001) for both absolute amounts and on a concentration basis. CONCLUSION: In conclusion, clinical improvement following SRP was associated with significant reductions in MMP-8 levels. The GCF concentration of MMP-8 decreased after initial therapy but reduced even more dramatically (approximately 50%) following a 3-month period of maintenance (P < 0.001).

MAXILLARY EXPANSION IN CLASS II CORRECTION WITH ORTHOPEDIC CERVICAL HEADGEAR: A POSTEROANTERIOR CEPHALOMETRIC STUDY

KIRJAVAINEN MIRJA, KIRJAVAINEN TURKKA
Angle orthodontist 73: 281-185, 2003

Class-II, division-1 malocclusion appears to be associated with a narrow maxilla. A Class-II malocclusion may be corrected to a Class-I relationship in children using a cervical headgear provided that the narrow maxilla is expanded. This expansion is
possible using headgear by dental cast analysis, but this has not been confirmed by cephalometry. We studied the effects of orthopedic cervical headgear on dental and skeletal facial widths in 40 children aged 9.1 (7.2-11.5) who had Class-II, division-I malocclusions. The headgear consisted of a long outer bow bent 15 degrees upward and a large inner bow expanded by 10 mm. Posteroanterior cephalographs and dental casts were taken before and after treatment. The results were compared with the control values presented in the literature. The malocclusion was treated to a Class-I relationship in all children. The average treatment time was 1.6 (0.3-3.1) years. The maxilla was widened significantly (P < .0001). The upper first molar width (um-um) and maxillary width (mx-mx) increased 3.2 and 1.6 mm/y, respectively. Maxillary widening was also observed in the nasal structure as indicated by an increase in lateronasal width (lap-lap) by 1.0 mm/y (P < .005). With maxillary widening, the mandibular dental arch widened spontaneously. The lower first molar width (lm-lm) increased 0.8 mm/y, which was more than the increase in the controls (P < .0001). However, the antegonial width (ag-ag) remained unaffected. By using a widened inner bow in headgear therapy with Class-II malocclusions, a widening of maxilla and nasal cavity may be obtained.

SALIVARY CARBONIC ANHYDRASE VI AND ITS RELATION TO SALIVARY FLOW RATE AND BUFFER CAPACITY IN PREGNANT AND NON-PREGNANT WOMEN

KIVELÄ JYRKI, LAINE MERJA, PARKKILA SEppo, RAJANIEMI HANNU
Archives of oral biology 48: 547-551, 2003

OBJECTIVE: Previous studies have shown that pregnancy may have unfavourable effects on oral health. The pH and buffer capacity (BC) of paraffin-stimulated saliva, for example, have been found to decrease towards late pregnancy. Salivary carbonic anhydrase VI (CA VI) probably protects the teeth by accelerating the neutralization of hydrogen ions in the enamel pellicle on dental surfaces. Since estrogens and androgens are known to regulate CA expression in some tissues, we studied here whether salivary CA VI concentration shows pregnancy-related changes. DESIGN: Paraffin-stimulated salivary samples were collected from nine pregnant women 1 month before delivery and about 2 months afterwards and assayed for salivary CA VI concentration, BC and flow rate. The enzyme concentration was determined using a specific time-resolved immunofluorometric assay. The control group consisted of 17 healthy non-pregnant women. RESULTS: The results indicated that salivary CA VI levels varied markedly among individuals, but no significant differences in mean concentrations were seen between the samples collected during late pregnancy and postpartum. BC values were lower during pregnancy, however. CONCLUSIONS: Our findings suggest that CA VI secretion is not significantly affected by the hormonal alterations associated with pregnancy, and confirm the earlier reports that CA VI is not involved in the regulation of actual salivary BC.
LAMININ-5 [GAMMA]2-CHAIN AND COLLAGENASE-2 (MMP-8) IN HUMAN PERI-IMPLANT SULCULAR FLUID

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Clinical oral implants research. 14: 158-165, 2003

Laminin-5 (LN-5) is an important epithelial cell-derived structural and adhesive component in hemidesmosomes and basement membranes (BM). In peri-implant tissue, gingival BM underlies the junctional epithelium (JE) and reflects the peri-implant health. Matrix metalloproteinase-8 (MMP-8 or collagenase-2) is one of the key mediators of periodontal tissue destruction. Western immunoblotting with image analysis was used to quantitate the molecular forms of LN-5 gamma2-chain and MMP-8 in peri-implant sulcular fluid (PISF) from healthy and diseased implants. These observations were related to the recorded gingival (GI) and bone resorption (BR) indices of the studied sites. Altogether, 72 PISF samples from osseointegrated dental implants were examined. Significantly elevated levels of fragmented LN-5 gamma2-chain species (45 and 70 kDa) and MMP-8 immunoreactivities were observed in diseased PISF in relation to healthy PISF. The elevated levels of both LN-5 gamma2-chain 45 and 70 kDa fragments and MMP-8 in diseased PISF from peri-mucositis (BR = 0) and peri-implantitis (BR >/= 1) lesions strongly correlated with elevated GI. Low levels - almost comparable to those seen in healthy control PISF - were seen in PISF from peri-implantitis lesions (BR >/= 1) with no GI. Activation of 75 kDa neutrophil (PMN)-type proMMP-8 to 10 kDa lower-molecular-size active forms was especially detected in PISF from peri-implantitis with elevated GI. These cross-sectional findings indicate that elevated MMP-8 and LN-5 gamma2-chain fragment levels in PISF can reflect the active phase of the inflammatory peri-implant disease. Longitudinal studies are required to assess their use, either alone or in combination as molecular biochemical PISF markers, to predict the risk of progression of peri-implantitis, as well as to monitor the impact of treatment of the disease.

LEVELS AND MOLECULAR FORMS OF MMP-7 (MATRILYSIN-1) AND MMP-8 (COLLAGENASE-2) IN DISEASED HUMAN PERI-IMPLANT SULCULAR FLUID

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Journal of periodontal research 38: 583-590, 2003

OBJECTIVES: Matrix metalloproteinases (MMPs) play crucial role in various tissue destructive inflammatory processes by degrading almost all peri-cellular and basement membrane components. MMP-8 (collagenase-2) is the major MMP in periodontitis. MMP-7 (matrilysin-1), in addition to its ability to degrade matrix and basement membrane components, activates other latent pro-MMPs and defensins, host cell-derived
antimicrobial cryptidins. The aim of the present study was to characterize the relationship, levels and molecular forms of MMP-8 and MMP-7 in diseased peri-implant sulcular fluid (PISF). MATERIALS AND METHODS: Seventy-two human dental implant fluid samples were collected with filter paper strips from peri-implant sulci from healthy and untreated diseased implant sites. Gingival index (GI) and/or bone resorption (BR) were also recorded. Western immunoblot method with polyclonal anti-human-MMP-8 and monoclonal anti-human-MMP-7 antibodies was used, and immunoreactivities were quantified with computer scanning program. The effects of MMP inhibitors (doxycycline, chemically modified tetracycline-3, clodronate, CTT-peptide and marimastat) were studied on the activity of recombinant human matrilysin-1 (MMP-7) using beta-casein degradation assay. RESULTS: The levels of active forms of MMP-8 and MMP-7 were significantly elevated in diseased PISF in relation to healthy PISF. Furthermore, MMP-8 and MMP-7 levels correlated significantly to each other and GI. MMP-8 was present not only as bands corresponding to 75-kDa polymorphonuclear leukocyte (PMN) -type pro- and 65-kDa active forms, but also as 55-kDa non-PMN-type pro- and 45-kDa active forms. Immunoreactivities > 80 kDa most likely represented dimeric and/or inhibitor-bound MMP-8 complexes and the low molecular weight (< 30 kDa) species were apparently degraded fragments. In diseased PISF, 19-21-kDa active MMP-7 and 28-30-kDa pro-MMP-7 species were detected, and the active 19-21-kDa forms of MMP-7 predominated in diseased PISF. Doxycycline (50 micro m and 250 micro m), chemically modified non-antimicrobial tetracycline (CMT-3) (50 micro m and 100 micro m), clodronate (a bisphosphonate, 20 micro m and 500 micro m) and the cyclic CTT (CTTHWGFTLC)-peptide (125 micro m and 250 micro m), all known broad-spectrum or selective MMP-inhibitors, did not inhibit the activity of human recombinant MMP-7; only marimastat (1 micro m and 5 micro m) inhibited MMP-7. DISCUSSION: Increased immunoreactivities of the active MMP-8 and MMP-7 species in PISF from diseased peri-implantitis lesions eventually reflect the stage and course of peri-implantitis; MMP-7 may potentially act as MMP-8 and defensin activator in diseased PISF. CONCLUSION: The elevated levels of MMP-8 and matrilysin-1/MMP-7 were identified in active forms in diseased PISF, but MMP-7 was less prominent. MMP inhibitors, potential future tissue protective drugs, seemingly do not interfere with the defensive antibacterial action of MMP-7.

PREVALENCE AND PHYSICAL STATUS OF HUMAN PAPILLOMA VIRUS IN SQUAMOUS CELL CARCINOMAS OF THE HEAD AND NECK

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Fresh-frozen biopsies were obtained from 61 patients at diagnosis of squamous cell carcinoma of the head and neck (HNSCC) for study of the prevalence and physical status
of human papillomavirus (HPV) DNA. The frequency of HPV DNA and genotypes were determined by SPF10 PCR screening with a general probe hybridization and INNO-LiPA HPV genotyping assay. In addition, a single-phase PCR with primers FAP 59/64 and a nested PCR with primers CP 65/70 and CP 66/69 served to detect particularly cutaneous HPV types. By the sensitive SPF10 PCR and INNO-LiPA assay, 37 of 61 (61%) samples were positive for HPV. HPV-16 was the most frequently detected type (31 of 37, 84%). Multiple infections were found in 8 of 37 (22%) of the HPV-positive samples, and co-infection by HPV-16 and HPV-33 was predominant. No cutaneous HPV types were detected. Patients with HPV-positive tumors had similar prognosis as those with HPV-negative ones. Real-time PCR analysis of the HPV-16 positive samples indicated the presence of integrated (11 of 23, 48%), episomal (8 of 23, 35%) and mixed forms (4 of 23, 17%) of HPV DNA. The viral load of HPV DNA exhibited large variation. The median copy numbers of E6 DNA in tonsillar specimens were approximately 80,000 times higher than that in nontonsillar HNSCC ones. Patients with episomal viral DNA were more frequently found to have large (T3-T4) tumors at diagnosis than were those with integrated or mixed forms. Copyright 2003 Wiley-Liss, Inc.

VESTIBULAR DYSFUNCTION IN ADULT PATIENTS WITH OSTEOGENESIS IMPERFECTA

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Progressive hearing loss is a major symptom in osteogenesis imperfecta (OI), a genetic brittle bone disease. Vertigo is frequently associated with otosclerosis in which the hearing loss clinically resembles that in OI. Vertigo is also common in basilar impression (BI) found in up to 25% of adult OI patients. In order to evaluate the cause, frequency, and characteristics of vertigo in OI, 42 patients were studied by interview, clinical examination, and audiological examination supplemented with electronystagmography (ENG) and lateral skull radiography. Audiometry showed hearing loss in 25 patients (59.5%). Nine patients (21%) displayed abnormal skull base anatomy in the forms of basilar impression, basilar invagination, or both, all designated here as BI. Twenty-two patients (52.4%) reported vertigo, mostly of floating or rotational sensation of short duration. Patients with hearing loss tended to have more vertigo than patients with normal hearing. Vertigo was not correlated with type of hearing loss or auditory brain-stem response (ABR) pathology. ENG was abnormal in 14 patients (33.3%). No dependency was found between vertigo and deviant ENG results. Patients with BI tended to have more vertigo than patients with normal skull base but the difference was not statistically significant. Neither ENG pathology, nor the presence or type of hearing loss showed correlation with BI. In conclusion, vertigo is common in patients with OI. In most cases, it may be secondary to inner ear pathology, and in only some patients does BI explain it. Since some OI patients without BI or hearing loss also suffer from vertigo, further clinical
Actinobacillus actinomycetemcomitans is a gram-negative, facultatively aerobic bacterium which is associated especially with aggressive forms of periodontitis. Contradictory results on the localization of the A. actinomycetemcomitans serotype-specific antigen have been reported. The aim of the present study was to characterize the A. actinomycetemcomitans serotype d-specific antigen. The antigen was isolated by affinity chromatography. The affinity column was prepared from immunoglobulin G isolated from rabbit antiserum raised against A. actinomycetemcomitans serotype d. The isolated antigen was analyzed by sodium dodecyl sulfate-polyacrylamide gel electrophoresis, Western blotting, and silver staining, all of which revealed a ladder-like structure typical for the O antigen of lipopolysaccharide (LPS). In a displacement enzyme-linked immunosorbent assay (ELISA), the isolated antigen displaced in a concentration-dependent manner the binding of the polyclonal rabbit antiserum raised against A. actinomycetemcomitans serotype d to the competing whole-cell serotype d antigen. The isolated antigen contained LPS, and an equal concentration of LPS isolated from A. actinomycetemcomitans serotype d gave a similar displacement curve in the ELISA. In order to test the immunogenic properties of the isolated antigen, it was used to immunize a rabbit. The antiserum raised against the isolated antigen displayed specificity in Western blotting and ELISA similar to that of antibody raised against LPS isolated from A. actinomycetemcomitans serotype d. In conclusion, our results show that the A. actinomycetemcomitans serotype d-specific antigen contains the O-antigenic structure of LPS.
A MISENSE MUTATION IN PAX9 IN A FAMILY WITH DISTINCT PHENOTYPE OF OLIGODONTIA

LAMMI LAURA, HALONEN KATRI, PIRINEN SINIKKA, THESLEFF IRMA, ARTE SIRPA, NIEMINEN PEKKA

Mutations in PAX9 have been described for families in which inherited oligodontia characteristically involves permanent molars. Our study analysed one large family with dominantly inherited oligodontia clinically and genetically. In addition to permanent molars, some teeth were congenitally missing in the premolar, canine, and incisor regions. Measurements of tooth size revealed the reduced size of the proband's and his father's deciduous and permanent teeth. This phenotype is distinct from oligodontia phenotypes associated with mutations in PAX9. Sequencing of the PAX9 gene revealed a missense mutation in the beginning of the paired domain of the molecule, an arginine-to-tryptophan amino-acid change occurring in a position absolutely conserved in all sequenced paired box genes. A mutation of the homologous arginine of PAX6 has been shown to affect the target DNA specificity of PAX6. We suggest that a similar mechanism explains these distinct oligodontia phenotypes.

CARBONIC ANHYDRASE ISOZYMES IX AND XII IN GASTRIC TUMORS

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World journal of gastroenterology 9 (7): 1398-1403, 2003

AIM: To systematically study the expression of carbonic anhydrase (CA) isozymes IX and XII in gastric tumors. METHODS: We analyzed a representative series of specimens from non-neoplastic gastric mucosa and from various dysplastic and neoplastic gastric lesions for the expression of CA IX and XII. Immunohistochemical staining was performed using isozyme-specific antibodies and biotin-streptavidin complex method. RESULTS: CA IX was highly expressed in the normal gastric mucosa and remained positive in many gastric tumors. In adenomas, CA IX expression significantly decreased towards the high grade dysplasia. However, the expression resumed back to the normal level in well differentiated adenocarcinomas, while it again declined in carcinomas with less differentiation. In comparison, CA XII showed no or weak immunoreaction in the normal gastric mucosa and was slightly increased in tumors. CONCLUSION: These results demonstrate that CA IX expression is sustained in several types of gastric tumors. The variations observed in the CA IX levels support the concept that gastric adenomas and carcinomas are distinct entities and do not represent progressive steps of a single pathway.
GELATINASE B IS ASSOCIATED WITH PERI-IMPLANT BONE LOSS

MA JIAN, KITTI UULA, HANEMAAIJER ROELAND, TERONEN OLLI, SORSΑ TIMO, NATAH SIRAJEDIN, TENΣING EVE-KAI, KONTΤINΕN YΡJΟ T.
Clinical oral implants research 14: 709-713, 2003

The aim of this study was to clear whether gelatinase B is associated with peri-implant bone loss (PBL). Peri-implant sulcus fluid was collected from 46 implant sites in 12 patients. These sites were also characterized using modified Gingival Index (mGI). Activated and total gelatinase B levels, measured using a modified urokinase assay, showed correlation with PBL (n = 46, Spearman's rank correlation test). Activated and total gelatinase B values were significantly higher in PBL > 3 mm group (n = 6) compared to PBL < 1 mm (n = 29) and 1 < PBL < 3 mm (n = 11) groups (rank sum test). Activated gelatinase B level in mGI > 0.5 group (n = 24) was clearly higher compared to mGI = 0 (n = 13) and < or = 0.5 (n = 9) groups (Rank sum test). We conclude that gelatinase B is associated with PBL. Activation of gelatinase B together with elevated mGI eventually reflect active phases of peri-implantitis and may prove to be diagnostically useful.

DIRECT EVIDENCE OF COLLAGENOLYSIS IN CHRONIC PERIODONTITIS

MA JIAN, SORSΑ TIMO, BILLINGHURST CLARK R., POOLE ROBIN A., KITTI UULA, SANTAВIRTA SEΡPO, KONTΤINΕN YΡJΟ T.
Journal of periodontal research 38: 564-567, 2003

BACKGROUND: There is no previous evidence that collagenases in chronic periodontitis excessively cleave collagen fibrils. OBJECTIVES: In this study the eventual presence of neoepitopes produced in such a cleavage were looked for. METHODS: A polyclonal antibody, which recognizes collagenase-cleaved collagen type I 3/4 carboxy-terminal neoepitope (COL1-3/4C), was used in avidin-biotin-peroxidase complex staining. RESULTS: In addition, moderate staining was seen in connective tissue bordering to the sulcular and junctional epithelium, surrounding some of the fibroblasts and in some areas infiltrated by inflammatory mononuclear cells. COL1-3/4C staining in chronic periodontitis was more extensive (6.3 +/- 1.2%, n = 10) and intense than that observed in controls (1.6 +/- 0.7%, n = 10, Unpaired Student's t-test, p < 0.01). CONCLUSIONS: It is concluded that collagenases produced by host cells contribute to periodontal tissue destruction and attachment loss.
PERIAPICAL INFLAMMATION AFFECTING CORONALLY-INOCULATED DOG TEETH WITH ROOT FILLINGS AUGMENTED BY WHITE MTA ORIFICE PLUGS

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Journal of endodontics 29 (7): 442-446, 2003

Placement of orifice plugs has been suggested to augment the seal of conventional root canal fillings. This study assessed in vivo the efficacy of white mineral trioxide aggregate (MTA) plugs in preventing periapical inflammation subsequent to coronal inoculation of root-filled teeth. The two-rooted mandibular premolars of six beagle dogs were conventionally prepared and filled with gutta-percha and sealer. A white MTA orifice plug was placed into one canal in each tooth. Pulp chambers were inoculated with plaque except for 12 teeth (negative control), and restored. Radiographs were taken at regular intervals. At 10 months, dogs were killed and jaw blocks processed for histology. None of the roots revealed radiographic or histologic evidence of severe inflammation. Mild inflammation was observed in 17% and 39% of the roots with and without an orifice plug, respectively (McNemar, p > 0.05). Without development of severe inflammation, the seal augmentation efficacy of MTA orifice plugs could not be determined.

INHIBITION OF MATRIX METALLOPROTEINASES BY CHEMICALLY MODIFIED TETRACYCLINES IN SEPSIS

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Sepsis precipitates a systemic inflammatory stimulus that causes systemic release of cytokines and sequestration of polymorphonuclear neutrophils, resulting in degranulation of matrix metalloproteinases (MMPs), which causes extracellular matrix basement membrane degradation. One of the important anti-inflammatory properties of tetracyclines is their ability to inhibit MMPs. In this study, we focused on the regulation of MMPs in sepsis and their reduction by treatment with nonantimicrobial chemically modified tetracyclines (CMTs), which retain their anti-inflammatory activity. Sepsis was induced by cecal ligation and puncture (CLP) method. At 24 h and 1 h before CLP, some rats received CMT-3 (25 mg/kg), another group of rats received hydroxamate (H; an inhibitor of MMP; 25 mg/kg), and untreated rats received saline by gavage. At 0 h, 0.5 h, 1.5 h, and 24 h after CLP, blood and liver samples were collected. Plasma and liver MMP-9 by zymography and Western immunoblotting, plasma nitric oxide by measuring nitrate level, plasma glutamic oxaloacetic transaminase (GOT) and glutamic pyruvic transaminase (GPT) by enzymatic method, and liver gelatinase by radiolabeled gelatin lysis assay and 24 h mortality were determined. Plasma MMP-9 (92 kDa), nitrate, and
GOT and GPT levels were elevated compared with the time 0 level and reached peak at 1.5 h CLP and remained high for 24 h. Both CMT-3 and H treatment reduced GOT, GPT, 92-kDa gelatinase, and nitrate levels throughout the 24 h. CMT-3 and H are equally effective in sepsis treatment. The 24-h mortality for CLP rats was 30%, whereas pretreatment with CMT-3 and H resulted in 0% mortality. Hepatic MMP-9 and gelatinase activity increased significantly after CLP, and pretreatment with CMT-3 and H inhibited these expressions. These results indicate the beneficial effect of CMT-3 in preventing the increase in GOT, GPT, NO, MMP-9, gelatinase activity, and the ensuing septic shock.

CLINICAL MEDICINE IN DENTAL EDUCATION

MEURMAN JUKKA H.

DENTAL INFECTIONS AND SERUM INFLAMMATORY MARKERS IN PATIENTS WITH AND WITHOUT SEVERE HEART DISEASE

MEURMAN JUKKA H., JANKET SOK-JA, QVARNSTRÖM MARKKU, NUUTINEN PEKKA
Oral surgery, oral medicine, oral pathology, oral radiology, and endodontics 96: 695-700, 2003

OBJECTIVE: The objective of this study was to investigate if patients with severe heart disease (CHD patients) present more signs of dental infections than patients without heart disease (non-CHD patients), if serum inflammatory markers differ between the groups, and if there is a link between these and the oral health parameters. METHODS: We performed clinical and radiologic dental examinations and collected serum samples of 256 patients with New York Heart Association class II-IV heart disease (CHD patients) and 250 non-CHD controls. Serum samples were analysed using pertinent methods in the clinical laboratory of the hospital, and the differences in serum biomarkers between CHD patients and non-CHD patients were examined using various statistical methods. A modified dental index (MDI) was constructed and used in the analyses. RESULTS: CHD patients were significantly more likely to be edentulous (34.8% vs. 14.8%) and retain less natural teeth than non-CHD patients (8.6 vs. 17) (P < .001). In CHD patients the remaining teeth and supporting tissues were more often diseased. High MDI scores were significantly associated with CHD status (OR 1.31, CI 1.16-1.48), as was gingivitis (OR 3.37, CI 1.66-6.86), while the presence of deep periodontal pockets was not. Serum C-reactive protein and fibrinogen concentrations and blood erythrocyte sedimentation rates were higher in the CHD group. Also, H. pylori and Chlamydia antibodies were significantly higher in the CHD group. CONCLUSION: CHD patients presented with poorer oral health status than non-CHD patients. Serum inflammatory markers were significantly higher in the CHD patients compared to the non-CHD group. High MDI scores linked with risk of CHD.
OBJECTIVE: Little is known about the dental health and health behavior of patients referred for open-heart surgery because of severe heart disease. Yet, coronary atherosclerosis has been suggested to be an inflammatory disease in which chronic dental infections may trigger pathogenic mechanisms in the walls of arteries. In epidemiological studies periodontal disease in particular has been linked with coronary heart disease (CHD). STUDY DESIGN: We set out to investigate by means of clinical examination, x-ray, and questionnaire the oral health status, health-related behavior, and conceptions of 256 CHD patients referred for open-heart surgery in the Kuopio University Hospital. The patients' heart disease was New York Heart Association grades II-IV. For comparison, 250 age- and sex-matched non-CHD patients were also studied. Differences between groups were analyzed conventionally and with the Total Dental Index (TDI), which uses linear modeling and logistic regression analyses to summarize periodontal factors and other signs of oral infections. We expected to find neglected dental care and worse oral health situation among the CHD patients. RESULTS: Edentulousness was seen in 35% of the CHD group and in 15% of the non-CHD group (P < .001). The CHD group had significantly lower number of teeth (8.8 +/- 9.1) than the non-CHD group (17 +/- 10.5; P < .001). No dental appointment in the past 10 years was reported in 66% of the CHD patients and 35% of the non-CHD patients. Forty-nine percent of the CHD group and 69% of the non-CHD group had had a dental visit within the past 2 years (P < .001). Daily tooth brushing was reported by 46% of the CHD group and 56% of the non-CHD group (P < .05). Only 2% of the CHD group and 8% of the non-CHD group flossed daily (P < .001). TDI scores were significantly higher in the edentulous than in the dentate study groups (P < .001), but no difference was observed between CHD and non-CHD patients of the same dentate or edentulous status. Mean TDI score was 3.2 +/- 0.8 in edentulous CHD patients and 3.1 +/- 0.4 in edentulous non-CHD patients; the scores in the dentate patients were 2.5 +/- 0.9 in the CHD group and 2.4 +/- 2.0 in the non-CHD group. The TDI score appeared almost significant a predictor of CHD when used as a dependent variable in logistic regression analysis (P = .08). CONCLUSION: Worse oral health status and less satisfactory oral health behavior were observed in the CHD patients than among the cardiologically healthy.
TUMOR-ASSOCIATED TRYPSINOGEN-2 (TRYPSINOGEN-2) ACTIVATES PROCOLLAGENASES (MMP-1, -8, -13) AND STROMELYSIN-1 (MMP-3) AND DEGRades TYPE I COLLAGEN

MOILANEN MERJA, SORSa TIMO, STENMAN MATHIAS, NYBERG PIA, LINDY OTSO, VESTERINEN JAANA, PAJU ANNUKKA, KONTTINEN YRJÖ T., STENMAN ULF-HÅKAN, SALO TUULA

critical step in cancer growth and metastasis is the dissolution of the extracellular matrix surrounding the malignant tumor, which leads to tumor cell invasion and dissemination. Type I collagen degradation involves the initial action of collagenolytic matrix metalloproteinases (MMP-1, -8, and -13) activated by MMP-3 (stromelysin-1). The role of interactive matrix serine proteinases (MSPs), including tumor-associated trypsinogens, has been unclear in collagenolysis. Now, we provide evidence that the major isoenzyme of human tumor-associated trypsinogens, trypsin-2, can directly activate three collagenolytic proMMPs as well as proMMP-3. These proMMP activations are inhibited by tumor-associated trypsin inhibitor (TATI). Furthermore, we demonstrate that trypsin-2 efficiently degrades native soluble type I collagen, which can be inhibited by TATI. However, cell culture studies showed that trypsin-2 transfection into the HSC-3 cell line did not result in MMP-1, -3, -8, and -13 activation but affected MMP-3 and -8 production at the protein level. These findings indicate that human trypsin-2 can be regarded as a potent tumor-associated matrix serine protease capable of being the initial activator of the collagenolytic MMP activation network as well as directly attacking type I collagen.

GINGIVAL CREVICULAR FLUID COLLAGENASE-2 (MMP-8) TEST STICK FOR CHAIR-SIDE MONITORING OF PERIODONTITIS

MÄNTYLÄ PÄIVI, STENMAN MATHIAS, KINANE D. F., TIKANOJA SARI, LUOTO HANNE, SALO TUULA, SORSa TIMO

BACKGROUND: A rapid chair-side test based on the immunological detection of elevated levels of collagenase-2 (matrix metalloproteinase-8, MMP-8) in gingival crevicular fluid (GCF) was developed to identify and monitor the course and treatment of adult periodontitis. METHODS: MMP-8 was determined in GCF from periodontitis (11 patients, 90 sites), gingivitis (10 patients, 58 sites) and healthy control (8 patients, 59 sites) sites (i) by a test stick incorporating monoclonal antibodies to two epitopes on MMP-8 and (ii) by measuring MMP-8 concentration by a quantitative immunofluorometric assay. Patients with adult periodontitis were treated by scaling and root planing (SRP) and received oral hygiene instructions. GCF MMP-8 testing and clinical measurements were done before and after SRP. RESULTS: MMP-8 GCF levels and chair-side test differentiated periodontitis from gingivitis and healthy control sites. MMP-8 GCF levels > 1 mg/l and positive chair-side test identified especially severe
periodontitis sites. A positive and negative test stick result, the outcome of which was rapidly detectable in 5 mins, in GCF correlated well with MMP-8 immunofluorometric assay analysis from the collected GCF samples and the severity of periodontitis. Scaling and root planing reduced the MMP-8 levels in severe periodontitis sites with positive MMP-8 test and gingival probing pocket depth (PD) > 5 mm before treatment. The test stick result and the quantitative assay were discrepant in only 18 of the 207 sites tested, thus agreement was very good (kappa = 0.81). With a threshold of 1 mg/l MMP-8 activity the chair-side test provided a sensitivity of 0.83 and specificity of 0.96 (n = 207). CONCLUSION: The MMP-8 test can be used to differentiate periodontitis from gingivitis and healthy sites as well as to monitor treatment of periodontitis. A reduction in GCF MMP-8 levels and a change in test stick result provide a means to optimize patient control during maintenance of periodontal treatment.

THERMAL SENSATION AND PAIN IN ORAL LICHEN PLANUS AND LICHENOID REACTION


BACKGROUND: Our previous findings in oral lichen planus (OLP) and lichenoid reactions (LR) raised the question whether the histopathological changes observed in sensory and autonomic innervation produce oral sensory disorders. METHODS: Spontaneous pain was assessed using the Visual Analogue Scale (VAS). Thermal pain thresholds were measured with a contact thermostimulator and mechanical pain thresholds with an electronic algometer. RESULTS: Patients with OLP reported a higher intensity of spontaneous pain than LR patients (P = 0.001). Even erosive LRs were relatively painless. No thermal or mechanical hyperalgesia was detected in oral lesions. Highest separate cold pain threshold was measured in lesions affected by intense Candida growth. CONCLUSION: Together with previous histological findings, the present data suggest that increased somatic innervation and sympathetic denervation do not promote clinical pain sensitivity or hyperalgesia in oral mucosa and that these sensory functions are not affected by OLP and LR. Candida growth may function as secondary irritant modulating the pain responses.
Abnormalities of the short arm of chromosome 4 cause multiple congenital malformations, including craniofacial, oral, and dental manifestations. A candidate gene for oral defects in this region is MSX1, which is mandatory for normal oral and tooth development. We examined the dentition and the presence of MSX1 in eight Finnish patients with abnormalities of 4p, including seven cases of Wolf-Hirschhorn syndrome. Five of the Wolf-Hirschhorn syndrome patients presented with agenesis of several teeth, suggesting that oligodontia may be a common (even though previously not well-documented) feature in Wolf-Hirschhorn syndrome. In fluorescence in situ hybridization (FISH) analysis, the five patients with oligodontia lacked one copy of MSX1, while the other three had two hybridization signals. One of these presented with the only case of cleft palate among the patients. Our result confirms that haploinsufficiency for MSX1 serves as a mechanism that causes selective tooth agenesis but, alone, is not enough to cause oral clefts.

GUIDELINES FOR CURRICULUM OF UNDERGRADUATE AND POSTGRADUATE EDUCATION IN OROFACIAL PAIN AND TEMPOROMANDIBULAR DISORDERS IN EUROPE

NILNER MARIA, STEENKS MICHEL, BOEVER JAN DE, CIANCAGLINI RICCARDO, KÖNÖNEN MAUNO, ORTHLIEB JEAN-DANIEL

THE INFLUENCE OF A MATRIX METALLOPROTEINASE ON THE REMINERALIZATION OF ARTIFICIALLY DEMINERALIZED DENTIN

NORDBØ HÅKAN, LEIRSKAR JAKOB, NGO HIEN, MOUNT GRAHAM J., WAHLGREN JAANA

Purpose: This investigation aimed at determining whether a collagenolytic matrix metalloproteinase (MMP-8) present in the oral fluids might attack demineralized dentin and thereby affect the potential for remineralization.

Materials and Methods: Dentin specimens from freshly extracted third molars were demineralized for 14 days in vitro and then remineralized for 7 days in the presence or absence of activated MMP-8. Following treatment the mineral level of the specimens was assessed from the outer dentinal surface using Electron Probe Micro Analysis (EPMA).
**Results:** The findings suggested that the addition of activated MMP-8 to the remineralizing solution led to reduced remineralization in the surface of the dentin. There appeared to be no effect on the remineralization from any dentin bound MMP activity.

**Conclusion:** It appears that MMP-8 may negatively influence the remineralization of demineralized dentin.

**Key words:** dentin, matrix metalloproteinase, remineralization

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**ENDOSTATIN INHIBITS HUMAN TONGUE CARCINOMA CELL INVASION AND INTRAVASATION AND BLOCKS THE ACTIVATION OF MATRIX METALLOPROTEASE-2, -9, AND -13**

NYBERG PIA, HEIKKILÄ PIA, SORSA TIMO, LUOSTARINEN JANI, HELJASVAARA RITVA, STENMAN ULF-HÅKAN, PIHLAJANIELI TAINA, SALO TUULA


Endostatin, a 20-kDa collagen XVIII fragment, inhibits angiogenesis and tumor growth in vivo, but the mechanisms are still unclear. Matrix metalloproteases (MMPs), a family of extracellular and membrane-associated endopeptidases, collectively digest almost all extracellular matrix and basement membrane components, and thus play an important role in tumor progression. We studied the effects of recombinant human endostatin on human MMP-2, -9, -8, and -13. We found that endostatin inhibited the activation and catalytic activity of pro-MMP-9 and -13 as well as recombinant pro-MMP-2. It prevented the fragmentation of pro-MMP-2 that was associated with reduction of catalytic activity. Endostatin had no effect on MMP-8 as shown by collagenase activity assays. An in vitro migration assay and an in vivo chicken chorioallantoic membrane intravasation assay with the human tongue squamous cell carcinoma cell line HSC-3 revealed the biphasic nature of endostatin; low endostatin concentrations inhibited intravasation and migration of these cells in a dose-dependent manner, but at increased concentrations, the inhibitory effect was far less efficient. The results show that endostatin blocks the activation and activities of certain tumor-associated pro-MMPs, such as pro-MMP-2, -9, and -13, which may explain, at least in part, the antitumor effect of endostatin. Our results also suggest that endostatin inhibits tumor progression by directly affecting the tumor cells and not just acting via endothelial cells and blockage of angiogenesis.

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**TOOTH FORMATION AND THE MANDIBULAR SYMPHYSIS DURING THE FIRST FIVE POSTNATAL MONTHS**

NYSTRÖM MARJATTA, RANTA HELENA


Schedules based on tooth development are useful in age assessments of children, but in early infancy they are based on only a few studies. The radiographic appearance of the
mandibular symphysis during the first postnatal months has not gained attention. The present study describes the formation of teeth and the development of fusion between the mandibular halves during the first five postnatal months, as seen in panoramic tomograms taken in medicolegal autopsies of 29 ethnic Finns, 19 boys and 10 girls, at the Department of Forensic Medicine, University of Helsinki. In the majority of the infants, the criteria of sudden infant death (SID) were fulfilled. The stages of tooth formation used were those applied by Moorrees et al. with one modification (Nystrom et al.). Mineralization of all primary teeth proceeded rapidly during the first postnatal months, the change being on average two developmental stages in four months. Considerable variation in tooth development existed in infancy. The mandibular halves were separated at birth. Complete fusion had occurred in the majority of infants aged four months, and the tomograms of the remaining infants showed a thin vertical line in a part of the symphysis. The marked changes, which during the first postnatal months occur in the radiographical appearance of the mandibular symphysis, and in the formation of primary teeth, provide valuable information for age assessments of infants.

ACTINOBACILLUS ACTINOMYCETEMCOMITANS AND HAEMOPHILUS APHROPHILUS IN SYSTEMIC AND NONORAL INFECTIONS IN FINLAND

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APMIS 111: 653-657, 2003

The oral cavity is the ecological niche for Actinobacillus actinomycetemcomitans and Haemophilus aphrophilus, but occasionally they cause severe nonoral infections. In this study we present 20 systemic or nonoral infections due to A. actinomycetemcomitans and H. aphrophilus, comprising all isolates of these species forwarded to and stored in Finnish reference laboratories during the years 1988-2000. The time from specimen collection to correct species identification was 9.3 days for A. actinomycetemcomitans and 10.7 days for H. aphrophilus. A. actinomycetemcomitans strains represented serotypes a, b, c, and d. Arbitrarily primed PCR distinguished four A. actinomycetemcomitans and six H. aphrophilus genotypes. Antimicrobial susceptibility testing with benzylpenicillin, amoxicillin, tetracycline, metronidazole, azithromycin, and trovafloxacin showed generally good activities against the present strains, and the susceptibility patterns closely resembled those of oral strains. The prolonged time to recover and identify A. actinomycetemcomitans and H. aphrophilus from systemic and nonoral infections may delay the correct diagnosis of the patient, but the good antimicrobial efficacies of antimicrobial agents against these pathogens give a good prognosis for the patients and advance the treatment of severe infections caused by these fastidious organisms of oral origin.
EXPRESSION PROFILE OF MATRIX METALLOPROTEINASES (MMPS) AND TISSUE INHIBITORS OF MMPS IN MATURE HUMAN ODONTOBLASTS AND PULP TISSUE

PALOSAARI HEIDI, PENNINGTON CAROLINE, LARMAS MARKKU, EDVARDS DYLAN, TJÄDERHANE LEO, SALO TUULA

Previous studies have demonstrated that (at least) matrix metalloproteinase (MMP)-2, -8, -9, -14 and -20 are expressed by human odontoblasts. Here, we analysed the expression of 19 MMPs and their specific tissue inhibitors (TIMP)-1, -2 and -3) -1, -2 and -3 in mature human odontoblasts and pulp tissue. Since MMP-20 is almost exclusively expressed by the dentin-pulp complex cells, we further analysed the effect of transforming growth factor (TGF)-beta1 and bone morphogenetic protein (BMPs)-2 on its expression. Matrix metalloproteinase-9 served as a positive control for growth factor responsiveness. It was found that MMP-1, -2, -9, -10, -11, -13, -14, -15, -16, -17, -19, -20 and -23, in addition to TIMP-1, -2 and -3 were expressed by both odontoblasts and pulp tissue. Neither MMP-3 nor MMP-12 were expressed in odontoblasts or pulp tissue, and MMP-7, -8, -24 and -25 were expressed only in the odontoblasts; MMP-2, -10, -11, -14 and -20 were expressed more abundantly by odontoblasts, whereas pulp tissue expressed more MMP-13 and MMP-17. Transforming growth factor-beta1 (1 ng ml(-1)) and BMP-2 (100 ng ml(-1)) did not markedly affect MMP-20 mRNA expression. In contrast, TGF-beta1 alone and with BMP-2 significantly upregulated MMP-9 mRNA by 2.4-fold and by 2.6-fold, respectively, in odontoblasts, while in pulp tissue no effects could be detected. The wide-scale expression of MMPs and TIMPs by mature human odontoblasts and pulp tissue suggests that they may participate in dentin matrix organization prior to mineralization, and that growth factors may further control dentin matrix modeling by differentially regulating individual MMPs.

RESTORATIVE TREATMENT AND USE OF LOCAL ANESTHESIA IN FREE AND SUBSIDIZED PUBLIC DENTAL SERVICES IN HELSINKI, FINLAND

PALOTIE ULLA, VEHKALAHTI MIIRA

Our aim was to evaluate restorative treatment and the use of local anesthetics in free and subsidized public dental care in Helsinki, Finland. Public dental clinics are open to all patients under the age of 36, and to some specific groups above that age. Patients up to age 19 receive all treatment free of charge and others at highly subsidized rates. Data were collected in May 2001 during a maximum 2-week period covering all public dental clinics in Helsinki. A one-page questionnaire was sent to all dentists (n = 140) in clinical fields. The data requested included the patient's gender and year of birth, and details on restorations: which tooth and which surfaces were filled, the reason for placement or replacement, the material used, and use of local anesthetic. The response rate was 96%. Of all restorations (n = 3057) placed, 14% were in primary teeth and in permanent teeth:
17% in premolars, 17% in incisors, and 52% in molars; the restorative material most often used was composite resin (69%). Glass-ionomer/compomers dominated in the primary teeth. Local anesthetic was used least (35%) in patients under 13 years of age. Replacements of restorations accounted for 10% of all in the free service (under 20 years of age) and 46% in subsidized dental care (20 and older). The major reasons for replacement were secondary caries (41%) and fractured or lost restoration (40%).

**SPHENOID SINUS MUCOCOELE: [LETTER TO THE EDITOR]**

Patinen Perti, Hietanen Jarkko, Peltola Jaakko
Oral surgery, oral medicine, oral pathology, oral radiology, and endodontics 95 (5): 513-514, 2003

**GELATINASE A (MMP-2), COLLAGENASE-2 (MMP-8), AND LAMININ-5 [GAMMA]2-CHAIN EXPRESSION IN MURINE INFLAMMATORY BOWEL DISEASE (ULCERATIVE COLITIS)**

Pirilä Emma, Ramamurthy Nungavaram, Sorsa Timo, Salo Tuula, Hietanen Jarkko, Maisi Päivi

Dextran sulfate sodium-induced inflammatory bowel disease in mice resembles human ulcerative colitis. In inflammatory bowel diseases matrix metalloproteinases contribute to tissue degradation. Laminin-5 is an anchoring filament protein in the basement membrane area that can be cleaved by matrix metalloproteinases. We investigated the expression of matrix metalloproteinases-2 and -8 and laminin-5 gamma2-chain in dextran sulfate sodium-induced mice by immunohistochemistry and in situ hybridization. Matrix metalloproteinase-8 expression was evidenced in the colon surface epithelial cells and the protein was more abundant in dextran sulfate sodium-induced mice colon. Matrix metalloproteinase-2 and laminin-5 gamma2-chain colocalized in the colon surface epithelial cells and in the basement membrane zone as demonstrated by double immunostaining. In dextran sulfate sodium-induced colon, matrix metalloproteinase-2 immunoreactivity was detected in epithelial cells in the lower parts of the crypt and surrounding the degraded crypts. Matrix metalloproteinase-2 and -8 could participate in the local epithelial inflammatory processes and tissue destruction. The presence of laminin-5 gamma2-chain indicates alternative anchoring mechanisms in the colon, a compartment devoid of hemidesmosomes.
Matrix metalloproteinase (MMP)-2 and membrane type 1-MMP can process the laminin-5 (Ln-5) gamma2-chain, revealing a cryptic site inducing epithelial cell migration. We investigated whether other MMPs process the Ln-5 gamma2-chain and related their ability to induce epithelial cell migration. The N-terminal sequences of the MMP-3, -12, -13, and -20 processed 80kDa Ln-5 gamma2x-chains were identical whereas the N-terminus of the 80kDa(MMP-8) Ln-5 gamma2x-chain was not. MMP-3, -13, -14, and -20 induced MCF-7 cell migration over Ln-5 while MMP-8 was a poor inducer of MCF-7 cell migration. In conclusion, several MMPs can process the Ln-5 gamma2-chain and induce epithelial cell migration.

Antibodies to periodontal pathogens are associated with coronary heart disease

OBJECTIVE: We analyzed the association of coronary heart disease (CHD) and serology of periodontitis in a random sample (n=1163) of men (aged 45 to 74 years) by determining serum IgG-antibodies to Actinobacillus actinomycetemcomitans and Porphyromonas gingivalis. METHODS AND RESULTS: CHD (n=159) was more prevalent among edentulous than dentate subjects (19.8% and 12.1%, P=0.003). In the dentate population, CHD was more common among subjects seropositive for P. gingivalis compared with those seronegative (14.0% and 9.7%, P=0.029). Accordingly, CHD was more prevalent in subjects with a high combined antibody response than those with a low response (17.4% and 11.1%, P=0.026). When adjusted for age and several CHD risk factors, the subjects with a high combined antibody response had an odds ratio of 1.5 (95% CI, 0.95 to 2.50, P=0.077) for prevalent CHD. In a linear regression model, the combined antibody response was directly associated with prevalent CHD (P=0.046) and inversely with serum HDL cholesterol concentration (P=0.050). CONCLUSIONS: In conclusion, edentulousness and serum antibodies to major periodontal pathogens were associated with CHD. This suggests that periodontal infection or response of the host against the infection may play a role in the pathogenesis of CHD.
PERIODONTITIS IS ASSOCIATED WITH A LOW CONCENTRATION OF VITAMIN C IN PLASMA

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This study aimed to clarify how concentrations of vitamin C in plasma relate to the serology of periodontitis. The random sample used comprised 431 men, 194 from Finland and 237 from Russia. The plasma vitamin C concentration was determined by o-phtaldialdehyde-fluorometry, and serum immunoglobulin G antibodies to Actinobacillus actinomycetemcomitans and Porphyromonas gingivalis were determined by a multiserotype enzyme-linked immunosorbent assay (ELISA). The mean plasma vitamin C concentration was higher (P < 0.001) in Finnish subjects (mean +/- standard deviation, 4.5 +/- 2.8 mg/liter) than in Russian subjects (1.4 +/- 1.8 mg/liter). Mean antibody levels to both A. actinomycetemcomitans (4.7 +/- 3.6 versus 5.2 +/- 3.1 ELISA units [P = 0.05]) and P. gingivalis (5.7 +/- 2.5 versus 7.6 +/- 2.9 ELISA units [P < 0.001]) were lower in Finnish men than in Russian men. In the combined Finnish and Russian population, the antibody levels to P. gingivalis were negatively correlated with vitamin C concentrations (r = -0.22; P < 0.001); this association remained statistically significant (P = 0.010) in a linear regression model after adjustment for confounding factors. The proportion of P. gingivalis-seropositive subjects decreased with increasing vitamin C concentrations (P for trend, <0.01), but no trend was seen among A. actinomycetemcomitans-seropositive subjects. In conclusion, P. gingivalis infection is associated with low concentrations of vitamin C in plasma, which may increase colonization of P. gingivalis or disturb the healing of the infected periodontium.

PLASMA PHOSPHOLIPID TRANSFER PROTEIN-MEDIATED REACTIONS ARE IMPAIRED BY HYPOCHLORITE-MODIFICATION OF HIGH DENSITY LIPOPROTEIN

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The two main functions of phospholipid transfer protein (PLTP) are the transfer of phospholipids between plasma lipoproteins and the conversion of high density lipoprotein (HDL), where prebeta-HDL particles are generated. HDL is considered an anti-atherogenic lipoprotein due to its function in the reverse cholesterol transport, where prebeta-HDL accepts cellular membrane cholesterol from peripheral tissues. However, the anti-atherogenic properties of native HDL may be abolished by oxidation/modification. Hypochlorous acid/hypochlorite (HOCl/OCl-)a potent oxidant generated in vivo only by the myeloperoxidase-H2O2-chloride system of activated phagocytes-alters the physiological properties of HDL by generating a pro-atherogenic
lipoprotein particle. Therefore, we have studied the effect of HOCl on the function of HDL subclass 3 (HDL3) and triglyceride-enriched HDL3 (TG-HDL3) in PLTP-mediated processes in vitro. Modification of HDL3 and TG-HDL3 with increasing HOCl concentrations (oxidant:lipoprotein molar ratio between 25:1 and 200:1) decreased the capacity of the corresponding lipoprotein particles to accept phospholipids. Although binding of PLTP to unmodified and HOCl-modified lipoprotein particles was similar, the degree of PLTP-mediated HDL conversion was decreased upon HOCl oxidation. PLTP released apolipoprotein A-I (apoA-I) from HOCl-modified HDL3, but the particles formed displayed no prebeta-mobility. Based on these findings, we conclude that the substrate properties of HOCl-modified HDL3 and TG-HDL3 in PLTP-mediated processes are impaired, which indicates that the anti-atherogenic properties of HDL are impaired.

RADIOPHGRAPHIC FINDINGS ON 3RD MOLARS REMOVED IN 20-YEAR-OLD MEN

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In this study we assess radiographic findings characteristic of mandibular 3rd molars that had required either routine or surgical extraction. X-ray findings relating to acute pericoronitis were also examined. The material was collected by investigating patient records and rotational panoramic radiographs of 20-year-old Finnish male conscripts (n = 738) treated during military service because of 3rd-molar-related problems. The follicle around the crown of mandibular 3rd molars with acute pericoronitis was enlarged in 19% of cases and in 13% of chronic symptom-free pericoronitis cases (not statistically significant difference). Mandibular 3rd molars extracted surgically were more often mesially inclined than those extracted routinely (61% vs. 23%; P < 0.001), partially or totally intrabony impacted (92% vs. 66%; P < 0.001) and deep situated (on average 4.2 mm vs. 2.5 mm under the occlusal plane). Surgical extraction was also associated with the roots completely developed [92% vs. 84% of the teeth routinely extracted, odds ratio (OR) 2.6, 95% confidence interval (CI) 1.2-5.5] and with the absence of radiographic pericoronitis [around 27% vs. 39% of the teeth routinely extracted (OR 0.5, 95% CI 0.3-0.8)]. In 86% of cases the space between 2nd molar and ramus of the mandible was narrower than the 3rd molar extracted surgically, whereas this was 62% in routine extraction cases (P < 0.001). We conclude that there are some typical 3rd-molar findings in rotational panoramic radiographs that show a need for surgical extraction.
The aims of this study were to assess the prevalence of temporomandibular joint related (TMJ) painless symptoms, orofacial pain, neck pain, and headache in a Finnish working population and to evaluate the association of the symptoms with psychosocial factors. A self-administered postal questionnaire concerning items on demographic background, employment details, perceived general state of health, medication, psychosocial status, and use of health-care services, was mailed to all employees with at least 5 years at their current job. The questionnaire was completed by 1339 subjects (75%). Frequent (often or continual) TMJ-related painless symptoms were found in 10%, orofacial pain in 7%, neck pain in 39%, and headache in 15% of subjects. Females reported all pain symptoms significantly more often than men (P < 0.001). Frequent pain and TMJ-related symptoms were significantly associated with self-reported stress, depression, and somatization (P < 0.001). Perceived poor general state of health (P < 0.001), health care visits (P < 0.001), overload at work (P < 0.001), life satisfaction (P < 0.05), and work satisfaction (P < 0.05) were also significantly associated with pain symptoms, but the work duty was not (P > 0.05). Our findings are in accordance with earlier studies and confirm the strong relationship between neck pain, headache, orofacial pain. TMJ-related painless symptoms, and psychosocial factors. Furthermore, TMJ-related symptoms and painful conditions seem to be more associated with work-related psychosocial factors than with type of work itself.

AIMS: To apply the Finnish version of the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) Axis I to assess the occurrence of symptoms, signs, and specific subgroups of TMD, and to study the associations between the most common diagnoses and categoric demographic characteristics (gender, age group, marital status, type of work). METHODS: All 30- to 55-year-old employees of the Finnish Broadcasting Company with at least 5 years at their current employment received postal questionnaires (n = 1784). Of the 1339 respondents (75%), a randomly selected one fifth were clinically examined according to the RDC/TMD Axis I (n = 241, males 48%).
RESULTS: Pain symptoms in the face or jaw regions were perceived by 14.9% and pain with 1 or more jaw movements by 9.1%. Diagnoses by the RDC/TMD criteria were: Group I: myofascial pain in 12.9%, myofascial pain with limited opening in 0.4%; Group II: disc displacement with reduction in the right temporomandibular joint (TMJ) in 9.1% and in the left TMJ in 10.8%; Group III: arthralgia in 0.4% and 0.8%, osteoarthritis in 0% and 0.4%, and osteoarthrosis in 1.2% and 1.2%, respectively, in the right and left TMJs. The most common diagnoses were found more often among women than among men. No TMD diagnosis based on the RDC/TMD was obtained in 73% of the subjects.

CONCLUSION: The RDC/TMD appear to be of benefit in diagnosing TMD among these multiprofessional media personnel and thus may be suggested for use among nonpatient populations.

OVEREXPRESSION OF TIMP-1 UNDER THE MMP-9 PROMOTER INTERFERES WITH WOUND HEALING IN TRANSGENIC MICE

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Cell and tissue research 315 (1): 27-37, 2003

We have generated transgenic mice harboring the murine matrix metalloproteinase 9 (MMP-9) promoter cloned in front of human TIMP-1 cDNA. The transgenic mice were viable and fertile and exhibited normal growth and general development. During wound healing the mice were shown to express human TIMP-1 in keratinocytes that normally express MMP-9. However, the healing of skin wounds was significantly retarded with slow migration of keratinocytes over the wound in transgenic mice. In situ zymography carried out on wound tissues revealed total blockage of gelatinolytic activity (i.e., MMP-9 and MMP-2). The results confirm studies with MMP-9 knockout mice showing that MMP-9 is not essential for general development, but they also demonstrate an important role of keratinocyte MMP-9, as well that of other keratinocyte MMPs that are inhibited by TIMP-1, in wound healing. The transgenic mice generated in this study provide a model for the role of MMPs in MMP-9-producing cells in other challenging situations such as bone fracture recovery and cancer invasion.

IDIOPATHIC LENTICULAR MUCOCUTANEOUS PIGMENTATION (LAUGIER-HUNZIKER SYNDROME): A REPORT OF A CASE

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Laugier-Hunziker syndrome (LHS) is an acquired, benign, macular hyperpigmentation of the lips and oral mucosa, often associated with pigmentation of the nails. It is a rare disorder thought to be more common than the number of reported cases would suggest. It
is important to include this condition in the differential diagnosis of diffuse oral pigmentation. Here we report the first case of the Laugier-Hunziker syndrome in Scandinavia. Other conditions causing diffuse or multifocal pigmented oral lesions are discussed.

METALLOPROTEINASE INHIBITION REDUCES LUNG INJURY AND IMPROVES SURVIVAL AFTER CECAL LIGATION AND PUNCTURE IN RATS

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BACKGROUND: Neutrophil activation with concomitant matrix metalloproteinase-2 (MMP-2) and matrix metalloproteinase-9 (MMP-9) release has been implicated in the development of sepsis-induced acute lung injury. We hypothesized that COL-3, a chemically modified tetracycline known to inhibit MMP-2 and MMP-9, would reduce lung injury and improve survival in rats following cecal ligation and puncture (CLP).

METHODS: Sprague-Dawley rats were separated into five groups: 1) sham CLP + carboxymethylcellulose (CMC; vehicle for COL-3, n = 6); 2) sham CLP + COL-3 (n = 6); 3) CLP + CMC (n = 10); 4) CLP + single-dose (SD) COL-3 administered concomitant with CLP (n = 9); and 5) CLP + multiple-dose (MD) COL-3 administered concomitant with CLP and at 24 h after CLP (n = 15). Rats were sacrificed at 168 h (7 days) or immediately after death, with survival defined as hours after CLP. Histological lung assessment was made based on neutrophil infiltration, alveolar wall thickening, and intraalveolar edema fluid. Lung MMP-2 and MMP-9 levels were assessed by immunohistochemistry. MMP-2 and MMP-9 levels were correlated with survival by simple regression analysis.

RESULTS: The mortality of rats in the cecal ligation and puncture without treatment group (CLP + CMC) was 70% at 168 h. A single dose of COL-3 in the CLP + COL-3 (SD) group significantly reduced mortality to 54%. Furthermore, with a repeat dose of COL-3 at 24 h after CLP, mortality was significantly reduced to 33%. Pathologic lung changes seen histologically in the CLP + CMC group were significantly reduced by COL-3. A significant reduction in lung tissue levels of MMP-2 and MMP-9 was noted in both groups treated with COL-3. Reduction of MMP-2 and MMP-9 levels correlated with improved survival.

CONCLUSION: Inhibition of MMP-2 and MMP-9 by COL-3 in a clinically relevant model of sepsis-induced acute lung injury reduces pulmonary injury and improves survival in a dose-dependent fashion. Our results suggest that prophylactic treatment with COL-3 in high-risk patients may reduce the morbidity and mortality associated with sepsis-induced acute respiratory distress syndrome.
Proteolytic enzymes, such as matrix metalloproteinases (MMPs) and tumor-associated trypsinogens (TAT), play a pivotal role in tumor invasion and metastasis. Among MMPs, the interstitial collagenases (MMP-1, -8 and -13) can initiate collagenolysis. In this study, we have studied the levels of MMP-1, -8 and -13 in relation to the level of trypsinogen-2 in fluid from benign and malignant ovarian cysts. Elevated MMP-8 levels occur in many ovarian cyst fluids, and high MMP-8 levels are associated with malignancy. The concentrations of trypsinogen-2 correlate with those of MMP-8, but it remains to be shown whether trypsin-2 plays a role as its activator in vivo. The strong expression of MMP-8 over MMP-1 and MMP-13 in malignant ovarian tumors may indicate that MMP-8 participates in the protease cascades associated with the invasiveness of ovarian tumors.

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The aims of the present study were to assess the relationship pattern between bilateral masseter muscle electromyographic (MEMG) activity recordings and vertical jaw separation (VJS). Asymptomatic subjects (n = 15) were compared with age and gender-matched patients (n = 18) with temporomandibular pain and dysfunction (TMPD); before and after undergoing interocclusal appliance (IOA) therapy for 4 months. In asymptomatic subjects a bilateral minimum MEMG activity was found in a 'resting zone' at approximately a quarter of maximum mandibular opening (mean, 15.4 mm of VJS; range, 5.5-22.5 mm including overbite). No overall relationship between MEMG and VJS was shown for patients with TMPD. After successful IOA therapy, the majority of TMPD patients (14 of 18) showed normalization of the relationship between MEMG and VJS, but electromyographic assessment was not found to be of value as a single objective assessment parameter in evaluating the resolution of TMPD or the effectiveness of IOA therapy.
ATTENDANCE AT AND SELF-PERCEIVED NEED FOR CONTINUING
EDUCATION AMONG MONGOLIAN DENTISTS

TSEVEENJAV BATTSETSEG, VEHKAHLAHTI MIIRA, MURTOMAA HEIKKI

OBJECTIVES: In the present community trial, changes in oral health among adults with
diabetes in Finland were assessed in three differing intervention groups and in a control
group. The goal of intervention was to promote periodontal health. METHODS: The
study population comprised of 120 adults with diabetes, who were regular patients at the
Salo Regional Hospital Diabetes Clinic in Salo, Finland. All underwent periodontal
examination in 1999 and 2001. The percentage of dropouts was 4%. Outcome measures
were visible plaque, presence of calculus, and the Community Periodontal Index of
Treatment Needs (CPITN) index calculated for each tooth separately. Oral-health-related
factors were determined by a questionnaire. Intervention based on the recommended
treatment interval was carried out in the following groups: diabetes nurse-letter-reminder
group (n = 26), diabetes nurse-reminder group (n = 31), letter-reminder group (n = 30),
and a control group (n = 28). RESULTS: A significant decrease occurred in the visible
plaque index between 1999 and 2001 in all groups, and in calculus index in the diabetes-
nurse-reminder group and in the letter-reminder group. During the study period, only in
the control group, the CPITN index codes 3 and 4, calculated for each tooth separately,
increased. CONCLUSION: These positive results emphasize the potential of existing
health-care actions for promoting periodontal health. With minimal recourse demands, it
was possible to increase oral health behaviors and periodontal health among patients with
diabetes.

DENTAL HEALTH OF DENTISTS' CHILDREN IN MONGOLIA

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OBJECTIVES: To describe the dental health of dentists' children, to evaluate its
association with their dentist-parents' background and work-related characteristics and to
compare it with that of children in the general population in Mongolia. DESIGN: Cross-
sectional survey, questionnaire-based data. SUBJECTS: Dentists' children, aged 3-13
years. SAMPLE: All dentists (n = 250) actively practising in the capital city of Mongolia.
RESULTS: The dentists' children's dmft ranged from 0 to 12, and DMFT from 0 to 8;
50% were caries-free. The younger the children, the higher was their total caries
experience expressed as the sum of DMFT + dmft scores (r = -0.22; P = 0.001). Dentist-
parents' background and work-related factors were not associated with their children's
caries status (P > 0.05). When dentists' children were compared with their counterparts at
the population level, mean dmft for 6-year-olds was 2.6 for (urban) dentists' children, 6.5
for children in the urban population and 0.9 for those in rural population of equivalent
age. Mean DMFT for 12-year-olds were 1.0, 1.8 and 1.2, respectively, in the same three
groups. In general, (urban) dentists' children in all age groups had better dental health than did their urban counterparts at the population level. Among 5-7-year-olds, dentists' children had worse dental health than did their counterparts in the rural population.

CONCLUSIONS: Despite the dentists' knowledge and awareness, their children demonstrated higher rates of dental caries than expected. This suggests that Mongolian dentists may have insufficient preventive orientation. In particular, the primary dentition of younger children seems to be poorly valued. In Mongolia, dentists should have better training and education in modern methods of caries prevention and their advantages. Appreciation and care of the primary dentition need to be improved at all levels of oral health promotion in Mongolia.

TIME AND COHORT CHANGES IN PREVENTIVE PRACTICE AMONG MONGOLIAN DENTAL STUDENTS

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To evaluate time and cohort changes in preventive practice of dental students in Mongolia, a questionnaire was distributed to all clinical-year students in 2000 (n = 79) and in 2002 (n = 73) of the Dental School of the Mongolian National Medical University (MNMU). The questionnaire eliciting information on students' preventive care-related practice and knowledge, oral self-care (OSC) behaviour, and self-perceived competency, was administered to the students. Further, cross-sectional (between cohorts) comparisons to study changes over time and longitudinal (within-cohort) comparisons to reveal changes resulting from professional dental education were carried out. Statistical evaluations included chi-square test and linear regression model. Preventive practice of the students in 2002 tended to be better than that of their counterparts in the same study-year in 2000. Preventive practice among the fifth-year students improved significantly compared to that in their third year, except for counselling on nutrition. Survey-year, study-year, and knowledge of and self-reported competency in preventive care explained 38% of the variation in reported preventive practice. Besides the positive changes revealed, preventive practice among the students could still be improved. Regarding these tasks, professional education should provide meaningful learning experience on modern caries-preventive methods and dental community should support practice of preventive dentistry. A special programme could help to motivate the students to improve their own OSC.
REGULATION OF MMP-9 (GELATINASE B) IN ACTIVATED HUMAN MONOCYTE/MACROPHAGES BY TWO DIFFERENT TYPES OF BISPHOSPHONATES

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Metalloproteinases (MMP), particularly MMP-9 produced by the intratumor monocyte/macrophages, play an important role in tumor invasion and metastases. Recent clinical trials in patients with primary breast cancer suggest that bisphosphonates (BP), above all clodronate, may reduce bone metastases. The aim of the present study was to evaluate whether the effects of BPs on cancer dissemination include inhibition of MMP-9 production in human monocyte/macrophages. The effects of clodronate and pamidronate on the MMP-9 expression in and secretion from stimulated human monocyte/macrophages were measured using quantitative reverse transcriptase-polymerase chain reaction (RT-PCR) and enzyme-linked immunoadsorbent assay (ELISA), respectively. The MMP-9 mRNA levels remained relatively stable in the presence of clodronate. In contrast, pamidronate at 30 microM-300 microM increased the mRNA levels 5- to 10-fold. MMP-9 secretion was dose-dependently down-regulated by clodronate whereas pamidronate at 30 microM induced a 50% increase on MMP-9 secretion (p < 0.05), followed by a down-regulation at higher concentrations. The results suggest that MMP-9 is differentially regulated at mRNA and enzyme protein level by BPs, which affect ATP-dependent intracellular enzymes (clodronate) or post-translational modification of GTPases (pamidronate). These findings may have implications for the therapeutic use of these compounds.

TIMING AND EFFECT OF FISSURE SEALANTS ON PERMANENT MOLARS: A STUDY IN FINLAND AND SWEDEN

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Swedish dental journal 27 (4): 159-165, 2003

Fissure sealants are frequently used in the Nordic countries for the prevention of caries in children. The aim here was to analyse their use and effect on dental health in children and adolescents in Finland and Sweden. A retrospective longitudinal population-based study was performed in northern Finland and Sweden, where different strategies have been adopted for sealing teeth. The timing of sealant and restoration placements up to 18 years was studied in representative samples of subjects born in the early 1980s in Kemi, Oulu, Raah and Tornio in Finland (n = 908) and compared with a random sample of subjects from Norrbotten, Sweden (n = 634). A sensitive survival analysis method was applied to all the permanent molars separately (Virtanen et al. 1996). About 80-90% of molars had been sealed in the Finnish subjects, and approximately 30% in the Swedish cases, employing selective criteria. The filling increments were statistically significantly higher in Sweden than in Finland, although the differences were not of the same magnitude as
the reduction in sealants. More than 30% of first molars and 50% of second molars had not been treated, i.e. were without sealants or fillings, by the end of the follow-up in Sweden, compared with 10% and 20%, respectively, in Finland. Fissure sealants were effective in preventing caries in molars in children and adolescents, and the use of selective criteria for targeting this treatment can yield savings in effort and costs in a low caries situation, although more research is needed to find the optimum cost-effective strategy.

LAMININ-5 GAMMA 2 CHAIN IS COLOCALIZED WITH GELATINASE-A (MMP-2) AND COLLAGENEASE-3 (MMP-13) IN ODONTOGENIC KARATOCYSTS

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Journal of oral pathology & medicine 32: 100-107, 2003

BACKGROUND: Odontogenic keratocyst (KC) differs from other epithelial odontogenic cysts in regard to increased epithelial proliferation and a strong tendency to recur. Laminin-5 (Ln-5) is an epithelial anchoring filament component, which after modulation by certain matrix metalloproteinases (MMPs), like MMP-2 and MMP-13, induces epithelial cell migration. METHODS: Using in situ hybridization and immunohistochemistry, we studied the Ln-5 gamma-2 chain expression related to the expression of MMP-2, -8, and -13 in different odontogenic cysts, including radicular cysts (RC; n = 11), follicular cysts (FC; n = 11), and odontogenic keratocysts (KC; n = 16). RESULTS: Ln-5 mRNA was present in all cysts examined, while less than half of KCs and RCs (33 and 40%, respectively) demonstrated MMP-2 mRNA. MMP-13 mRNA was present in all KC samples. Ln-5 protein was located as a continuous ribbon in BM zone of all KCs, and MMP-2 and MMP-13 immunoreactivities colocalized significantly with Ln-5 in that area. MMP-8 was expressed by stromal macrophages and epithelial goblet cells, but never located in BM zone. CONCLUSIONS: Our results indicate that the colocalization of Ln-5 with MMP-2 or MMP-13, but not with MMP-8, in BM zone of KCs, may be related to special characteristics of KC.

EXAMINATION ON CANDIDA SPP. IN REFRACTORY PERIAPICAL GRANULOMAS

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International endodontic journal. 36: 643-647, 2003

AIM: To examine the occurrence of Candida spp. in refractory periapical granulomas. METHODOLOGY: One hundred and three surgically removed periapical granulomas were subjected to molecular analysis for the occurrence of Candida albicans. DNA was extracted from the samples using a modified phenol/chloroform/isoamyl alcohol method
and was subjected to polymerase chain reaction (PCR) with OPA-03 and repetitive sequence (GACA)4 primers. The PCR products were separated in agarose gel electrophoresis, stained with ethidium bromide, visualized using UV light and the sequences were analysed. Samples indicating possible occurrence of Candida were further investigated by histological and immunohistological methods. Periodic acid-Shiff staining (PAS) was used to detect yeast cells and hyphae, and specific monoclonal antibodies to recognize high molecular mass mannoproteins present in the C. albicans cell wall. DNA extraction was controlled by running PCR using beta-actin primers (a housekeeping gene). C. albicans CCUG19915, C. tropicalis ATCC750, C. krusei ATCC6258, C. guilliermondii ATCC6260 and C. glabrata CCUG32725 served as positive controls in PCR. A tissue preparation of chronic atrophic candidosis in oral buccal mucosa served as a positive control for histological and immunohistological examinations. RESULTS: Polymerase chain reaction with beta-actin primers indicated successful DNA extraction in 68 out of 103 samples. The majority of the samples (50) were negative whereas 18 of the samples showed PCR products indicating possible occurrence of Candida spp. PAS-staining and immunohistological examination of these samples were, however, negative. Further analysis of the PCR products revealed sequences not typical for Candida spp. CONCLUSIONS: Candida spp. do not seem to occur in periapical granuloma.

YEASTS IN APICAL PERIODONTITIS

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Microbiological reports of apical periodontitis have revealed that yeasts can be isolated from approximately 5-20% of infected root canals. They occur either in pure cultures or together with bacteria. Almost all isolated yeasts belong to the genus Candida, and the predominant species is C. albicans. Pheno- and genotypic profiles of C. albicans isolates show heterogeneity comparable with those of isolates from other oral sites. C. albicans expresses several virulence factors that are capable of infecting the dentin-pulp complex, including dentinal tubules. This causes, consequentially, an inflammatory response around the root apex, which suggests a pathogenic role for this organism in apical periodontitis. Yeasts are particularly associated with persistent root canal infections that do not respond favorably to conservative root canal therapy. This may be due to the resistance of all oral Candida species against a commonly used topical medicament, calcium hydroxide. However, other antimicrobial agents may offer alternative therapeutic approaches and improve the treatment of these persistent cases of apical periodontitis.
The aim of the present study was to detect possible associations between trunk and cervical asymmetry and facial symmetry. Frontal cephalograms prepared in the natural head position, representing 79 subjects (40 males, 39 females) with mild to moderate trunk asymmetry, were analyzed separately for thoracic humps, lumbar prominences, and cervical inclination by discriminating two groups: right-sided-dominant and left-sided-dominant. The differences between the groups were analyzed using an unpaired 2-group t test. The results showed that location of the thoracic humps and inclination of the cervical spine was predominantly right-sided, while the location of lumbar prominence was predominantly left-sided. Craniofacial morphological variables of the head and face were nearly equal for right-sided and left-sided thoracic humps and lumbar prominences, showing that moderate trunk asymmetry does not affect facial symmetry. Further, it was found that frontal head position in relation to the true vertical (VER/ORB) is stable in that the angle between the supraorbital and vertical lines is constantly maintained close to 90 degrees regardless of moderate trunk asymmetry, indicating that visual perception control is most important in orienting the head in frontal plane. Maintenance of the head position takes place by cervical spine adaptation.
Ikäihmisillä sairauksien ja lääkehoitojen myötä yleistyvä syljen erityksen väheneminen aiheuttaa suun ekologiassa niin suuria muutoksia, että se asettaa aivan uusia vaatimuksia suun ja hammasproteesien hoidolle. Joka kolmannella yläleuan kokoproteesia käyttävällä on tulehdus proteesin alla. Proteesistomatiitin ehkäisy vaatii tehostettua proteesin harjausta, ja proteesi on syytä ottaa pois suusta yksin tai muutamaksi tunniksi päivillä, jotta vähäinen sylki pääsee huuhtelemaan ja voitelemaan proteesin alla olevaa limakalvoa. Proteesin säilyttäminen vedessä lisää mikrobien kasvua. Sienten ja bakteerien kasvun estämiseksi proteesi säilytetään kuivana.


\[ \text{LASTEN KARIESPREVENTIO JA KARIEKSEN HOITO} \]

ALALUUSUA SATU
HAMPAIDEN KOVAKUDOSTEN KEHITYSHÄIRIÖT

ALALUUSUA SATU, LUUKINMAA PIRJO-LIISA

PEDODONTIA

ALALUUSUA SATU, AINE LIISA, ASIKAINEN SIRKKA, ERIKSSON ANNA-LEENA, HURMERINTA KIRSTI, HÖLTTÄ PÄIVI, KARJALALINEN SARA,
LUUKINMAA PIRJO-LIISA, PIRINEN SINIKKA

MANDIBULAARI- JA LINGUAALIHERMOVAMMOJEN KIRURGINEN KORJAUS

ANTTONEN VIRVA, KONTIO RISTO, LINDQVIST CHRISTIAN
Suomen hammaslääkärilehti. N.S. 10 (4): 140-147, 2003


ONGELMALÄHTÖINEN DIAGNOSTIIKKA

AUTTI HEIKKI, BELL YRSA LE, MEURMAN JUKKA H., MURTOMAA HEIKKI
RADIOLOGIA

AUTTI TAINA, KIVISAARI LEENA, PELTOLA JAAKKO, ROBINSON SORAYA, TAMMISALO ERKKI, WOLF JUHANI

POTILASTYÖ

BELL YRSA LE, AUTTI HEIKKI, MEURMAN JUKKA H., MURTOmAA HEIKKI, NORDBLAD ANNE

ENDODONTIA

HAAPASALO MARKUS, SIREN EVA, ERIKSSON ANNA-LEENA

JUURIHOITO

HAAPASALO MARKUS, SIREN EVA, ERIKSSON ANNA-LEENA

SÄTEILYSUOJELUKOULUTUS TERVEYDENHUOLLOSSA:
SÄTEILYTURVAKESKUKSEN ST 1.7 ANTAMAT VELVOITTEET
HAMMASHUOLLOSSA

HAVUKAINEN RITVA, PELTOLA JAAKKO

Koska hammaslääkäriryöstöihin on tullut viime aikoina runsaasti tiedustelua koskien Säteilyturvakeskuksen lähettämää ohjetta ST 1.7 olemme katsoneet aiheelliseksi selventää ko. ohjeen merkitystä röntgentutkimuksia suorittavien vastaanottojen toiminnassa.
HAMMASHOIDON HYGIENIA

HEISKANEN KAIJA, VAINIO SIRPA-LIISA

SUUPATOLOGIA

HIETANEN JARKKO, AUTTI HEIKKI

SUUN LIMAKALVOJEN PAHANLAATUISET KASVAIMET

HIETANEN JARKKO, SCULLY CRISPIAN, KONTTINEN YRJÖ T.

LASTEN HAMMASHOITO

HÖLTTÄ PÄIVI

YLÄLEUAN OSTEOTOMIA OSANA HALKIOPOTILAAN ULKONÄÖN JA PURENNAN KORJAUSTA HUULI- JA SUULAKIHALKIOKESKUKSESSA

HURMERINTA KIRSTI, HUKKI JYRI, RAUTIO JORMA, HELJÖVAARA ARJA
Suomen hammaslääkärilehti N.S. 10 (13): 668-675, 2003

Osalle huuli- ja suulakihalkiopotilaista syntyy poikkeavan kasvun vuoksi epämuodos-
tumalle ominaiset piirteet: litteät kasvot, joissa pieni yläleuka sijaitsee kasvoissa takana ja ylhäällä. Nenä voi olla vino, ja hymyiltäessä ylhäät eivät juurikaan näy; Yläleuan kirurgisella siirtoleikkauksella ja siihen liittyvällä hampaiston oikomishoidolla, nenäleikkauksella sekä pehmytkudoskorjauksilla voidaan korjata leukojen luostollista epäsuhtaa ja virheellistä purentaa sekä korjata ulkonäköä ja hymyä. Tässä katsauksessa käsitellään Huuli- ja suulakihalkiokeskuksen kokemuksia halkiopotilaisten ortognaatissesta kirurgiasta ja kuvataan halkiophoidon erityisperinteitä ja hoitovaikeuksia.
HAMPAAN JA HAMPAISTON NORMAALI KEHITYS

HURMERINTA KIRSTI, NYSTRÖM MARJATTA

SUUHYGIENIA

KETO ANU, MURTOMAA HEIKKI

PALATINAALI- JA LINGUAALIKAARET SEKÄ HUULIPUSKURI

KLEEMOLA-KUJALA EIJA

SYVÄ PURENTA (KO7.23)

KLEEMOLA-KUJALA EIJA

ORTODONTIA

KLEEMOLA-KUJALA EIJA, PIRINEN SINIKKA, THESLEFF IRMA, VIROLAINEN KAIJA, NYSTRÖM MARJATTA, HURMERINTA KIRSTI, ARTE SIRPA, KILPELÄINEN PAULI, PIIRTINIELI PERTTI

METALIT JA METALLOKERAMIA

KÖNÖNEN MAUNO
PROTETIKKA

KÖNÖNEN MAUNO, RAUSTIA AUNE, AINAMO ANJA, HUJANEN ERKKI, KOSKINEN KAI-JERI, LAINE JUHANI, MÄHÖNEN KALEVI, NÄRHI TIMO, PORKO CARITA, SIPILÄ KIRSI, VARPAAVAARA PAULI, VIRTANEN KAUKO


SUULÄÄKETIEDE

KONTTINEN YRJÖ T., ALI AHMED, HIETANEN JARKKO, HÄYRINEN-IMMONEN RITVA, JUNGELL PETER, KILPI ANU, KUUSILEHTO ASKO, LAINE JUHANI, NATAH SIRAJEDIN, NISSALO SIRKKU, PATINEN PERTTI, SALO TUULA, SCULLY CRISPIAN, SEGERBERG MARGARETHA, SYRJÄNEN STINA, TERONEN OLLI, TÖRNWALL JYRKI


IHOTAUDIT JA SUUN LIMAKALVOT

KONTTINEN YRJÖ T., ALI AHMED, SCULLY CRISPIAN


LUPUS ERYTHEMATODES DISCOIDES (DLE)

KONTTINEN YRJÖ T., ALI AHMED, SCULLY CRISPIAN


SUUN HAAVAUMAT

KONTTINEN YRJÖ T., HÄYRINEN-IMMONEN RITVA, NATAH SIRAJEDIN, SCULLY CRISPIAN

LICHEN RUBER PLANUS (L43)
KONTTINEN YRJÖ T., KILPI ANU, JUNGEILL PETER, SCULLY CRISPION

DERMATITIS HERPETIFORMIS (L13.0)
KONTTINEN YRJÖ T., PATINEN PERTTII

MAHA-SUOLIKANAVAN SAIRAUDET
KONTTINEN YRJÖ T., SALO TUULA, TERONEN OLLI

YLEISSAIRAUKSIEN SUUILMENTYMIÄ
KONTTINEN YRJÖ T., SALO TUULA, TERONEN OLLI

VERISAIRAUDET
KONTTINEN YRJÖ T., SALO TUULA, TERONEN OLLI

PEMFIGUS (L10.0-10.4) JA PEMFIGOIDI (L12.0-L12.1)
KONTTINEN YRJÖ T., SCULLY CRISPION, HIETANEN JARKKO
SUUN LIMAKALVOJEN SYÖPÄVAARAA LISÄÄVÄT MUUTOKSET JA TILAT
KONTTINEN YRJÖ T., SCULLY CRISPIAN, HIETANEN JARKKO

SUUN LIMAKALVOJEN ÄRSYTYSHYPERPLASIAT
KONTTINEN YRJÖ T., SCULLY CRISPIAN, HIETANEN JARKKO

BAKTEERI-INFEKTIOIT
KONTTINEN YRJÖ T., SCULLY CRISPIAN, NIISSALO SIRKKU

SUUN LIMAKALVOLLA HYPERPLASIOITA AIHEUTTAVAT VIRUKSET
KONTTINEN YRJÖ T., SCULLY CRISPIAN, NIISSALO SIRKKU

REUMATAUDIT
KONTTINEN YRJÖ T., TÖRNWALL JYRKI, SEGERBERG MARGARETHA

YLIHERKKYYSOIREIDEN AIHEUTTAMAT REAKTIOT SUUN LIMAKALVOLLA
LAINE JUHANI, KONTTINEN YRJÖ T.

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ZYGOMAIMPLANTTI: UUSI PURENNAN REKONSTRUKTION VAHTOEHTO

LAINĖ PEKKA, SALO ANTERO, VARPAAVAARA PAULI, MAUNO JARI, AHLBERG JARI, LINDQVIST CHRISTIAN, SUURONEN RIITTA
Suomen hammaslääkärilehti N.S. 10 (13): 676-683, 2003


IN MEMORIAM: ARVI TASANEN 8.7.1924-1.3.2003

LAMBERG MATTI, HAPPONEN RISTO-PEKKA, LINDQVIST CHRISTIAN, OIKARINEN KYÖSTI

Professori, ylilääkäri John Arvi Tasanen kuoli 1.3.2003 sairauden murtamana mutta poismenoonsa valmistautuneena. Vaatimattomista oloista lähteneenä hän teki laajavälisestä ja kunnioittavasta elämäntyytä sekä hammaslääkärinä että lääkärinä.

HAMMASKIRURGIJASTA LEUKA- JA KASVOKIRURGIAAN

LINDQVIST CHRISTIAN, SUURONEN RIITTA

KASVOJEN ALAKOLMANNEKSEN MURTUMAT; KESKIKASVOJEN MURTUMAT; KASVOJEN YLÄKOLMANNEKSEN MURTUMAT; PEHMYTKUDOSVAMMAT

LINDQVIST CHRISTIAN
SUU- JA LEUKAKIRURGIA
LINDQVIST CHRISTIAN, AUTTI HEIKKI, KONTIO RISTO, Laine PEKKA,
LAMBERG MATTI, LEHTIMÄKI KIMMO, PAATSAMA JUHA, RIHTNIEMI
JARMO, SALO ANTERO, SUURONEN RIITTA, SÖDERHOLM ANNA-LIISA,
TÖRNWALL JYRKI, VÄHÄTAULO KIMMO, YLIKONTIOLA LEENA

LEUKANIVELEN SAIRAUDET
LINDQVIST CHRISTIAN, SALO CHRISTIAN
IN: THERAPIA ODONTOLOGICA. HELSINKI, ACADEMICA ISBN 952-5046-02-8
(SID.). 2003, S. 782-786

SYLKIRAUHASTEN KIRURGISET SAIRAUDET
LINDQVIST CHRISTIAN, TÖRNWALL JYRKI

TRAUMATOLOGIA
LINDQVIST CHRISTIAN, OIKARINEN KYÖSTI, KONTIO RISTO

IN MEMORIAM: BORIS CALONIUS SIIRTYI AJASTA IKUISUUTEEN
MEURMAN JUKKA H.

GENEERINEN SUBSTITUUTIO - MITÄ SE HAMMASHOIDON KANNALTA MERKITSEE?

MEURMAN JUKKA H.


MIKROBEJA AVARUUDESTA

MEURMAN JUKKA H.
Suomen hammaslääkärilehti. N.S. 10 (14): 765, 2003


PROFESSORI VAKIINNUTTI SUUPATOLOGIAN SUOMEEN: PROFESSORI BORIS CALONIUS

MEURMAN JUKKA H.
Helsingin sanomat. 1.11.2003

SARS-INFEKTIO

MEURMAN JUKKA H.
Suomen hammaslääkärilehti. N.S. 10 (9): 487, 2003

Kaakkois-Aasiassa on todettu epidemia, joka on saanut paljon julkisuutta viime aikoina. Sars on lyhenne sanoista "severe acute respiratory syndrome". Taudin epäillään leviänä

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pisaratartuntana. Rock-yhtye Rolling Stones peruutti Pekingin konserttinsa taudin
leviämisen pelossa suurten ihmismääräisen kokoontuessa sitä kuuntelemaan. Suuria
kansainvälisiä kongresseja on myös jouduttu peruuttamaan. Äkillisiä, vakavia ja usein
keuhkokuumeina ilmeneviä tautitapauksia on raportoitu helmikuusta alkaen Vietnamin
Hanoista, Hongkongista, Singaporesta, Kiinan Guangdong-maakunnasta, Taiwanista ja
Torontosta Kanadasta. Suurin osa sairastuneista on ollut sairaanhoitohenkilökuntaa tai jo
sairastuneiden perheenjäseniä. Tätä kirjoitettaessa huhtikuun puolivälissä oli
raportoitu WHO:lle 3 235, joista 154 oli menehtynyt. Yksi suomalainen kuoli
tautiin Kiinassa satutauan ilmeisesti lentokoneessa vieressään istuneelta seireikä
matkustajalta. Tauti on levämänä ja on muistuttava 1918 riehunutta Espanjan
tautia, joka kappoo 30-40 miljoonaa ihmistä.

SARS-VIRUKSEN GEENIKARTTA VALMIS

MEURMAN JUKKA H.


Vaikeaa ja maailman talousnäkymää huojuttanut hengitystieinfektiota aiheuttava,
aikaisemmin tuntematon koronavirus on lopullisesti identifioitu ja geenikartoitettu. Virus
sai nimen SARS-Co V. Identifioinnin myötä infektiosairauden tunnusmerkit, Kochin
postulaatit täyttyivät. Koronavirukset (Coronaviridae) ovat suuria vaipallisia RNA-
viruksia; 27-30 kb genomin omaavina ne ovat suurimpia tunnettujen RNA-viruksia. Tähän
astia tunnetut ihmisen koronaviruksit aiheuttavat lähinnä tyypillisiä flunssaoireita, mutta
monissa eläinlajeissa niiden on tiedetty aikaansaavan vaikeita hengitystieinfektiota,
neurologisia oireita ja hepatiitteja.

SIMON CONSTANTIN BENSOW: HAMMASLÄÄKÄRIKOULUTUKSEN
ENSIMMÄINEN ALOITTEENTEKIJÄ POHJOISMAISSA JA SUOMESSA

MEURMAN JUKKA H.


Simon Constantin Bensow, Matti Äyräpään opettaja ja Suomen Hammaslääkäriseuran
perustaja syntyi Pietarissa maaliskuun 12. päivänä 1828. Hänen isäänsä oli kultaseppä
Jakob Wolff Bensow, joka oli syntynyt 1799 Danzigissa, käynyt kouluntasen
Königsbergissä, muutanut ensin Tukholmaan ja sitten Pietariin, jossa tapasi tulevan
vaimonsa Jeanette Goldsmithin. Heidät oli vihittänyt Tukholmassa vuonna 1824. Häiden
jälkeen nuoripari oli palannut Pietariin, koska Bensowilla ei aluksi ollut oleskelulupaa
Tukholmassa. Vuonna 1828 he kuitenkin muuttivat Tukholmaan, ja perheeseen syntyi
kaikkiaan kuusi lasta, joista Simon Constantin oli toiseksi vanhin.
SUUN JA HAMPAIDEN SAIRAUDET
MEURMAN JUKKA H., MURTOMAA HEIKKI

SUUN INFEKTIOIT
MEURMAN JUKKA H.

VERENKUVAN VIITEARVOT MUUTTUVAT
MEURMAN JUKKA H.
Suomen hammaslääkäriilehti. N.S. 10 (17): 928, 2003

Tavallisimpiin kliiniin laboratoriotutkimuksiin kuuluu ns. pieni verenkuva. Viitearvot määrittyvät väestön normaalijakauman mukaisesti. Perusverenkuvan viitearvotyöryhmä on nyt tarkistanut suomalaisen aikuisväestön viitearvot, jotka koskevat 18 vuotta täyttäneitä ja sitä vanhempia henkilöitä.

YLEISLÄÄKETIEDE
MEURMAN JUKKA H., AUTTI HEIKKI

SUU- JA HAMMASSAIRAUKSIEN EHKÄSY
MEURMAN JUKKA H., MURTOMAA HEIKKI

HAMMASLÄÄKÄRI JA TUPAKOINNIN VASTUSTAMISTYÖ
MURTOMAA HEIKKI

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Hammashoitotyö on sekä fyysisesti että henkisesti kuormittava. Hammaslääkärin työn luonne on kuitenkin viimeisten vuosikymmenien aikana muuttunut paljon. Tämä on tuonut mukanaan uusia työelämän liittyviä riskejä kuten hampaiden muovipaikkaa-materiaalit. Lisäksi työelämän kasvaneet suoritus- ja tehokkuusvaatimukset ovat osaltaan lisänneet hammashoitohenkilökuntaan kohdistuvia paineita. Työperäisten sairauksien rekisterin ilmoitetut hammashoitoalan ammattitaudit ovat lähes kolminkertaistuneet viime vuoden aikana Suomessa. Vaikka kehittyneet hoitomenetelmät ja -teknologia helpottavat työn tekemistä, ei niiden avulla ole pystytty poistamaan sitä tosiseikkaa, että hoitotyö vaatii edelleen tarkkaa keskittymistä ja staattista lihastyötä sekä yksipuolisia työasentoja.

**TULISIKO SUUHYGIENISTISTÄ HYVÄ HAMMASLÄÄKÄRI (MIELIPIDE)**

MURTOMAA HEIKKI

Helsingin sanomat. p. A5, 2.1.2003

**SOSIAALIHAMMASLÄÄKETIEDE**

MURTOMAA HEIKKI, ALANEN PENTTI, HAUSEN HANNU, HELMINEN SEppo, KESKINEN HELINÄ, MASALIN KAI


**SUUTERVEYDEN EDISTÄMINEN**

MURTOMAA HEIKKI, KETO ANU, LEHTONEN ERJA, ROOS MARJA


**VASTAANOTON TOIMINTAVALMIUS**

MURTOMAA HEIKKI, HEISKANEN KAJA, KANERVA RISTO, LAPPI LEILA, PEUSSA TUIJA, ROOS MARJA, ULVIO KARI, VAINIO SIRPA-LIISA, ÖSTERBERG HANNELE

GEROPROTETTIKKA
NÄRHI TIMO, AINAMO ANJA

HAMMASIMPLANTTEJA YMPÄRÖIVIEN KUDOSTEN TUTKIMUS JA HOITO
NIEMINEN ANJA

NUORTEN PARODONTIITIT JA NIIDEN HOITO
NIEMINEN ANJA

PARODONTIUMIN TUTKIMINEN
NIEMINEN ANJA

PARODONTOLOGINEN HOITO
NIEMINEN ANJA

PARODONTOLOGINEN PERUSHOITO
NIEMINEN ANJA
PURENNAN MERKITYS PARODONTIUMIN HOIDossa

NIEMINEN ANJA

SUOMALAINEN SUUN TERVEYDENHUOLLON PALVELUJÄRJESTELMÄ

NIIRANEN TEIJÄ
Hymyssä suin 4-5, 2003


HUULI-SUULAKIHALKIOT

NYSTRÖM MARJATTA

ORTODONTTISEN POTILAAN TUTKIMINEN

NYSTRÖM MARJATTA, VIROLAINEN KAIJA

DENTOALVEOLAARINEN KIRURGIA

PAATSAMA JUHA, SUURONEN RIITTA, LINDQVIST CHRISTIAN
LEUKOJEN ALUEEN INFEKTIOT
PAATSAMA JUHA, SUURONEN RIITTA, LINDQVIST CHRISTIAN

IKÄIHMISTEN SUUN HOITO - MONIAMMATILLISTA YHTEISTYÖTÄ:
PÄÄKIRJOITUS
PAAVOLA PIRKKO, LAHTINEN AIRA, AINAMO ANJA

SÄTEILYSUOJAUS JA RÖNTGENTOIMINNAN LAADUNVARMISTUS
HAMMASLÄÄKÄRIN VASTAANOTOLLA
PELTOLA JAAKKO

SÄTEILYSUOJELUKOULUTUS TERVEYDENHUOLLOSSA: OHJEEN ST 1.7
ASETTAMAT VELVOITTEET HAMMASHUOLLOSSA
PELTOLA JAAKKO, HAVUKAINEN RITVA
Koska hammaslääkärijärjestöihin on tullut viime aikoina runsaasti tiedusteluja koskien Säteilyturvakeskuksen lähettämää ohjetta ST 1.7, olemme katsonet aiheelliseksi selventää kyseisen ohjeen merkitystä röntgentutkimuksia suorittavien hammaslääkäreiden toiminnassa.

HAMPAIDEN PUHKEAMISHÄIRIÖT
PIRINEN SINIKKA
KASVOJEN PURENNAN KEHITYS

PIRINEN SINIKKA

PURENTAVIRHEET

PIRINEN SINIKKA

PURENTAVIRHEIDEN HOIDONTARVE JA HOITOON VALINTA

PIRINEN SINIKKA

ASTMA JA SUUN TERVEYS: TUTKIMUKSELLA UUTTA TUNTUMAA
HAMMASLÄÄKÄRIN TYÖHÖN

PIRINEN SINIKKA, LAURIKAINEN KARI
Suomen hammaslääkärilehti. N.S. 10 (9): 484-486, 2003

Hammaslääkäri Kari Laurikaisen väitöskirjatyö ”Asthma and Oral Health” tarkastettiin Tampereen yliopiston terveystieteen laitoksella viime elokuussa. Tutkimus oli tehty laitoksen johtajan, professori Matti Hakaman ohjauksessa, ja vastaväittäjänä toimi professori Sinikka Pirinen Helsingin yliopiston hammaslääketieteen laitokselta. Tutkimus toi esiin mielenkiintoista tietoa aikuisen astmapotilaiden suun ja hampaiston kunnosta. Väittelijä on haastateltu siinä toivossa, että tutkimuksen esiintuva tieto saavuttaisi kollegakunnan ja parantaisi tästä kroonisesta sairaudesta kärsivien potilaiden suun ja hampaiston hoitoa. Samalla esittäen henkilö, joka hammaslääkärin koulutuksella on tehnyt työuran saavutuksia perinteisestä hammaslääkärin toimenkuvasta poikkeavissa tehtävissä lääketeollisuuden ja bioteknologian parissa.

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MATRIKSIN METALLOPROTEINAASTEN TULEHDUKSELLISTEN KEUHKOSAIRAUKSIEN KUDOSTUHOSSA

PRIKK KAIU


KATTAMINEN

SIREN EVA, HAAPASALO MARKUS

SUUNHOITOAINET JA PAIKALLISHOITOLÄÄKKEET

SÖDERLING EVA, MEURMAN JUKKA H., PIENIHÄKKINEN KAISU, SEPPÄ LIISA, TENOVUO JORMA


SORSA TIMO
Suomen hammaslääkärilehti. N.S. 10 (17): 963, 2003

Oulun yliopiston hammaslääketieteen laitoksen esimiehen professori Kyösti Oikarisen pääkirjoituksessa ”Tutkimusrahoitus kohdennettava kansallisesti tärkeisiin ongelmii”/Suomen Hammaslääkärilehti 15/2003 esitetään, että ”molekyylibiologiaan painottuva perustutkimus arvostetaan kliinisen ja epidemiologisen tutkimuksen edelle etenkin tutkimusrahoituksen suhteen” ja että ”tähän valitettavasti vaikuttavat julkaisufoorumien impact-faktorit ja julkaisujen laatu (sitaatioiden määrä)”. Professori Oikarinen myös esittää, että ”yllättävän vähän perustutkimuksen löydöksiä johtaa uusiin hoitomenetelmiin tai lääkkeisiin.”
PARODONTAALISAIRAUKSIEN LUOKITTELU JA ESIINTYVYYS
SUOMALAINEN KIMMO

APOLLONIAN TOIMINTAKERTOMUS VUODELTA 2002
SUURONEN RIITTA
Suomen hammaslääkärilehti N.S. 10 (13): 690-691, 2003

VASTAANOTON ENSIAPU
SUURONEN RIITTA
Suuhygienisti. (2): 4-7, 2003

ESILÄÄKITYS, SEDAAATIO, YLEISANESTESIA JA PUUDUTTAMINEN
SUURONEN RIITTA, AUTTI HEIKKI, RANDELL TARJA

HAMPaiden ja Leukaluiden Röntgendiagnostiikka
TAMMISALO ERKKI, KIVISAARI LEENA, PELTOLA JAAKKO

KIELEN SAIRAUDET
TERONEN OLLI
TUUMORINEKROOSITEKIJÄ ALFA JA MATRIKSIN METALLOPROTEINASEIT IHMISEN IENKUDOKSEN TUHOUTUMISESSA

TERVAHARTIALA TAINA
Suomen hammaslääkärilehti. N.S. 10 (17): 926-927, 2003


OIKOMISHOIDON BIOLOGISET PERUSTEET

THESLEFF IRMA

ENDODONTIA TÄNÄÄN JA HUOMENNA

TJÄDERHANE LEO
Suomen hammaslääkärilehti. N.S. 10 (1-2): 12-17, 2003


JUURIHOITO SÄÄSTÄÄ HAMPAAN

TJÄDERHANE LEO
Hyvä terveys. (12): 70-71, 2003

86
PARODONTAALISAIRAUUKSIEN TAUSTA JA DIAGNOSTIIKKA

UITTO VELI-JUKKA

PARODONTAALISAIRAUUKSIEN PATOGENEESI

UITTO VELI-JUKKA

PARODONTOLOGIA

UITTO VELI-JUKKA, ASIKAINEN SIRKKA, KNUUTILA MATTI, NIEMINEN ANJA, PERNU HILKKA, RUOKONEN HELLEVI, SUOMALAINEN KIMMO

SUUGERONTOLOGIA

VEHKALAHTI MIIRA, TILVIS REIJO

IRROTETTAVAT OIKOMISKOJEET

VIROLAINEN KAIJA, KLEEMOLA-KUJALA EIJA

MATRIXIN METALLOPROTEINAASIT PULPITISSA, KROONISESSA APIKAALISESSA PARODONTIITISSA JA LEUAN HAMMASPERÄISISSÄ KYSTISSÄ

WAHLGREN JAANA

HLL Jaana Wahlgrenin endodontian ja suupatologian alan väitöskirja “Matrix metalloproteinases in pulpitis, chronic apical periodontitis and odontogenic jaw cysts”

RADIOLOGISET TUTKIMUSMENETELMÄT

WOLF JUHANI, ROBINSON SORAYA, PELTOLA JAAKKO, TAMMISALO ERKKI, AUTTI TAINA

HAMMASHOIDON MATERIAALIT

YLI-URPO ANTTI, FORSS HELENA, KÖNÖNEN MAUNO, NÄRHI TIMO, OSTELA ILKKA, SEPPÄ LIISA, TANNER JOHANNA, VALLITTU PEKKA
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