

**HEALTH/BIOLOGICAL EFFECTS****PREVENTION AND CONTROL OF BRICK-TEA TYPE FLUOROSIS—A 3-YEAR OBSERVATION IN DANGXIONG, TIBET**

To evaluate the effects of preventing and controlling brick-tea type fluorosis, we carried out a 3-year field observation and assayed the total daily fluoride intake, urinary and serum fluoride level, and dental fluorosis prevalence and index in a boarding school in Dangxiong, Tibet, in students aged 8–15. We replaced the traditional brick tea with low-fluoride brick tea (LFBT). Reduction in the traditional brick-tea consumption decreased the total daily fluoride intake among the children, which still remained within the level of chronic intoxication but at a safe level. The study suggests that the LFBT is effective in the prevention and control of endemics of brick tea type fluorosis, although further improvement of the LFBT is required.

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Keywords: Brick tea; Fluoride intake; Fluorosis; Tibet.

Source: *Ecotoxicol Environ Saf.* 2003 Oct;56(2):222-7.

**CONTROLLING THE FLUORIDE DOSAGE IN A PATIENT WITH COMPROMISED SALIVARY FUNCTION**

**BACKGROUND:** High-concentration topical fluorides are used commonly with compromised salivary function due to irradiation and chemotherapy. **CASE DESCRIPTION:** The authors describe a 50-year-old man with previously treated cancer who was using tray-applied topical fluoride gel. He complained of gastric symptoms, difficulty in swallowing, leg muscle soreness, and knee joint soreness. A computed tomographic scan revealed thickening of the esophageal walls. An upper endoscopy revealed abnormal motility. The motility test indicated high-amplitude peristalsis and hypertensive lower esophageal sphincter, and urine testing indicated high levels of systemic fluoride. The patient's fluoride regimen was altered, and within a short period his urinary fluoride levels returned to normal and his symptoms resolved. **CLINICAL IMPLICATIONS:** Clinicians prescribing home-applied high-concentration fluorides need to be cognizant of the symptoms of fluoride toxicity, carefully monitor the patient's compliance with the treatment regimen, and adjust the dosage or mode of application to control the total ingested dose of fluoride.

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Keywords: Computed tomographic scan; Endoscopy results; Fluoride toxicity; Gastric symptoms; Knee joint soreness; Leg muscle soreness; Salivary function; Swallowing difficulties; Topical fluoride.

Source: *J Am Dent Assoc* 2005 Jan;136(1):67-70.

**SEVOFLURANE AND EMERGENCE BEHAVIORAL CHANGES IN PEDIATRICS**

Sevoflurane has rapidly replaced halothane as the inhaled anesthetic agent of choice for the pediatric population. Benefits of sevoflurane use include a quick induction and emergence from anesthesia, a nonpungent odor, which allows for mask induction, and decreased airway irritation, which results in a decrease in the incidence of bronchospasm and laryngospasm. Despite the positive aspects of sevoflurane, there are several side effects, including seizures during induction and maintenance, elevations in plasma inorganic fluoride and compound A concentrations, and an increased incidence of emergence delirium when compared to halothane. The purpose of this article is to inform perianesthesia nurses of the common complication of emergence behavioral changes associated with sevoflurane.

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Keywords: Elevated plasma fluoride; Emergency behavioral complications; Halothane; Pediatrics; Seizures from Sevoflurane; Sevoflurane.

Source: *J Perianesth Nurs* 2005 Feb;20(1):13-8.

#### **HYDROFLUORIC ACID BURNS: A RARE CHEMICAL EMERGENCY SITUATION**

Burns caused by hydrofluoric acid can be life-threatening. Of special significance is the often underestimated local and sometimes delayed deep action of the highly diffusible free fluoride ions and the accompanying systemic toxicity. The specific antidote calcium gluconate can be topically applied, injected into tissue or infused intra-arterially. Because of the extreme danger of systemic toxicity even after seemingly trivial injuries, monitoring in the intensive care station, especially by measuring the calcium concentration in blood and electrocardiography, and therapy is recommended.

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Keywords: Burns; Calcium gluconate; Electrocardiography; Fluoride ions; Hydrofluoric acid; Systemic toxicity.

Source: *Anaesthesist* 2005 Feb;54(2):123-6. [in German].

#### **AN IMPROVED METHOD FOR EMERGENT DECONTAMINATION OF OCULAR AND DERMAL HYDROFLUORIC ACID SPLASHES**

Accidental hydrofluoric acid (HF) splashes often occur in industrial settings. HF easily penetrates into tissues by initial acid action allowing fluoride ions to penetrate deeply, chelating calcium and magnesium. Resultant hypocalcemia and hypomagnesemia can be fatal. This report describes the utilization of Hexafluorine—a hypertonic, amphoteric, chelating decontamination solution—in workplaces where water decontamination followed by calcium gluconate inunction failed to prevent HF burns and systemic toxicity. Between 1998 and 1999, 16 cases of ocular and dermal HF splashes with either 70% HF or 6% HF/15% nitric acid (HNO<sub>3</sub>) were decontaminated with Hexafluorine at the worksite. HF burns did not develop and medical treatment other than initial decontamination was not required in 12/16 (75%) of the cases. In 7/16 (44%) of the cases, lost work time corresponded to duration of hospital observation (mean < 1 d).

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Keywords: Burns; Calcium gluconate; Fluoride ions; Hexafluorine; Hydrofluoric acid; Hypocalcemia; Hypomagnesia; Industrial settings; Magnesium; Nitric acid; Ocular and dermal splashes; Systemic toxicity.

Source: *Vet Hum Toxicol* 2004 Aug;46(4):216-8.

#### **DIET QUALITY IN YOUNG CHILDREN IS INFLUENCED BY BEVERAGE CONSUMPTION**

**BACKGROUND:** Replacement of milk with sugar-containing beverages could affect calcium intake and overall diet quality. **OBJECTIVE:** To describe dairy food, 100% juice and added sugar beverage intakes, contributions of dairy foods to diet quality, and effects of beverages on diet quality in young children. **METHODS:** We surveyed participants in the Iowa Fluoride Study (n = 645) at ages 1, 2, 3, 4 and 5 years and calculated intakes for 1–5 years (i.e. weighted averages). Nutrient, dairy food and beverage intakes were obtained from 3-day diaries; nutrient adequacy ratios were calculated as the nutrient intake to Recommended Dietary Allowance/Adequate Intake ratio; and dairy-dependent percentages were calculated as fractions of total diet nutrient adequacy ratios (truncated at 1) not met by non-dairy foods. **RESULTS:** Milk intakes were inversely associated with intakes of juice drinks (2, 4, 5 and 1–5 years), soda pop (2, 3, 4, 5 and 1–5 years) and added sugar beverages (2, 3, 4, 5 and 1–5 years). Dairy dependent fractions of 1–5 year nutrient adequacy ratios were 68% for calcium

and 61% for vitamin D. Higher 1–5 year calcium adequacy was predicted by higher energy, higher other dairy and lower added sugar beverage intakes while higher vitamin D adequacy was predicted by higher energy and higher other dairy intakes. Overall diet quality was predicted by higher energy, higher other dairy, lower 100% juice and lower added sugar beverage intakes. **CONCLUSIONS:** Dairy foods remain an important source of calcium and vitamin D, while added sugar beverages and, to a lesser extent, 100% juice decrease diet quality of young children.

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Keywords: Calcium; Diet quality; Iowa fluoride study; Juices; Milk intake; Sugar beverages; Vitamin D.

Source: J Am Coll Nutr 2005 Feb;24(1):65-75.

#### **ESTIMATION OF EXPOSURE TO FLUORIDE IN "LOS ALTOS DE JALISCO", MEXICO**

**OBJECTIVE:** To estimate the level of fluoride exposure and human health risks in Los Altos de Jalisco (Jalisco State Heights) region. **MATERIAL AND METHODS:** This study was conducted between May and July 2002. The fluoride concentrations of 105 water wells and six tap water samples were electrochemically measured. Exposure doses to fluoride and total intake of fluoride were estimated for babies (10 kg), children (20 kg), and adults (70 kg). **RESULTS:** The fluoride concentration of the water samples ranged from 0.1 to 17.7 mg/L. More than 45% of the water samples exceeded the national guideline value for fluoride of 1.5 mg/L. The estimated values of the exposure doses to fluoride and total intake of fluoride were in the range of 0.04-1.8 mg/kg/day and 0.5-18.4 mg/day, respectively. **CONCLUSIONS:** Dental fluorosis, skeletal fluorosis, and bone fractures are some of the potential health risks due to the intake of high doses of fluoride for the population of Los Altos de Jalisco. In order to reduce health risks, fluoridated salt, fluoridated toothpastes, and drinking water containing more than 0.7 mg/L of fluoride should be avoided.

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Keywords: Bone fracture; Dental fluorosis; Fluoridated salt; Fluoridated toothpaste; Fluoride exposure; Los Altos de Jalisco, Mexico; Skeletal fluorosis; Tap water; Water wells.

Source: Salud Publica Mex. 2005 Jan-Feb;47(1):58-63. [in Spanish].

#### **DENTAL EFFECTS**

**Editorial comment:** In the following six abstracts the effect of fluoride on dental caries is considered. In the article by Ekanayake L and van der Hoek W, the caries prevalence, in Sri Lanka, varied between 18–25% whilst the mean DMFT and DMFS values ranged from 0.29–0.54 and 0.45–0.67 respectively. In the article by Whelton H, Crowley E, O'Mullane D, Donaldson M, Kelleher V, and Cronin M, the mean dmft/DMFT scores, in the Republic of Ireland, for 5-, 8-, 12-, and 15-year-olds with domestic water fluoridation since birth were 1.0, 0.3, 1.1 and 2.1 respectively while in non-fluoridated areas they were 1.7, 0.3, 1.3 and 3.2, respectively. In the article by Iwakura ML and Morita MC, about children in Brazil, the decayed, missing, and filled teeth score (mean±standard deviation) at 12 years of age was 0.85±0.059 overall, 1.0±0.058 for fluoride mouth-rinsing program participants, and 0.70±0.060 for nonparticipants. The weekly mouth-rinsing program was not associated with a decreased prevalence of caries. In the article by Birkeland JM, Ibrahim YE, Ghandour IA, and Haugejorden O, children, in Sudan, using drinking water with 1.0–2.0 mg fluoride/L (median = 1.8), had a significantly higher caries prevalence (21% versus 8%) than in a 0.4 mg fluoride area. The study failed to demonstrate an effect of fluoride in drinking water on caries experience. In the article by Al Dosari AM, Wyne AH, Akpata ES, and Khan NB, among the primary schoolchildren, in Saudi Arabia, there was a statistically significant ( $p < 0.05$ ) difference in mean dmft scores at various fluoride levels with lowest dmft scores at the optimum water fluoride level (0.61–0.80ppm) and highest at two extremes, i.e., 0.0 to 0.3 ppm and  $> 2.5$  ppm, while in intermediate schoolchildren no significant difference in overall mean DMFT scores of children at various water fluoride

levels could be found. There was no linear correlation between water fluoride level and caries experience in these children. In the meta-analysis by Twetman S, Petersson L, Axelsson S et al. it is suggested that sodium fluoride mouthrinses may have an anti-caries effect in children with a limited background of fluoride exposure, but that its additional effect in children using fluoride toothpaste daily could be questioned. The conclusion can be drawn from these studies is that little anti-caries benefit was associated with higher fluoride exposure.

Bruce Spittle, Managing Editor.

**PREVALENCE AND DISTRIBUTION OF ENAMEL DEFECTS AND DENTAL CARIES IN A REGION WITH DIFFERENT CONCENTRATIONS OF FLUORIDE IN DRINKING WATER IN SRI LANKA**

**AIMS:** To assess the prevalence and distribution of developmental defects of enamel and caries in 14-year-old children who had been lifetime residents in a region with different concentrations of fluoride in drinking water in Sri Lanka. **DESIGN:** A cross-sectional survey. **SETTING:** Uda Walawe—a rural area in southern Sri Lanka where fluoride concentration in ground water is reported to be within the range of 0.05–6.10 mg/L. **METHOD:** A total of 518 children from six representative schools from this area were examined for developmental defects of enamel and dental caries using the modified DDE index and WHO criteria. The present analysis is limited to 486 children for whom drinking water samples were collected. **RESULTS:** Based on the fluoride concentration of the drinking water source the children were categorised into four groups: <0.3, 0.31–0.49, 0.5–0.7, and >0.7 mg/L. The prevalence of enamel defects ranged from 29–57% whilst 27–55% of children were affected by diffuse opacities in the four groups. Of the ten teeth examined, between 1.6–3.6 teeth per child were affected by enamel defects. Maxillary first premolars were the most commonly affected by diffuse opacities followed by the maxillary canines. Caries prevalence varied between 18–25% whilst the mean DMFT and DMFS values ranged from 0.29–0.54 and 0.45–0.67 respectively. Occlusal surfaces were the most affected by caries. **CONCLUSIONS:** The wide differences observed in the prevalence and severity of enamel defects indicate that there are variations in individual response to high fluoride levels in drinking water. It also demonstrates the need to ascertain the factors that could contribute to the prevalence and severity of enamel defects other than high fluoride levels in drinking water.

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Keywords: Dental caries; Enamel defects; Ground water fluoride; Maxillary canines, Maxillary first premolars; Sri Lanka.

Source: *Int Dent J.* 2003 Aug;53(4):243-8.

**DENTAL CARIES AND ENAMEL FLUOROSIS AMONG THE FLUORIDATED AND NON-FLUORIDATED POPULATIONS IN THE REPUBLIC OF IRELAND IN 2002**

**BACKGROUND:** A national survey of oral health of children and adolescents was carried out in the Republic of Ireland (RoI) in 2001/2002. **AIMS:** To compare the prevalence of caries between child and adolescent residents in fluoridated and non-fluoridated communities in the RoI whilst controlling for disadvantage. To compare caries levels amongst disadvantaged and non-disadvantaged groups with and without water fluoridation. To report the changes in caries levels between the 1960s and 2002 in RoI. To report the changes in dental fluorosis levels between 1984 and 2002. **METHODOLOGY:** Cross sectional oral health survey of a representative, random, stratified sample of 17,851 5-, 8-, 12- and 15-year-old children and adolescents in RoI. WHO examination criteria with the addition of visible, non-cavitated dentine caries were used for recording caries. Fluorosis was measured using Dean's Index. **RESULTS:** In the RoI the mean dmft/DMFT scores for 5-, 8-, 12-, and 15-year-olds were 1.2, 0.3, 1.1 and 2.3. For those with domestic water fluoridation since birth the scores were 1.0, 0.3, 1.1 and 2.1 respectively. In non-fluoridated areas of RoI the mean dmft/DMFT scores for 5-, 8-, 12-, and 15-year-olds was 1.7, 0.3, 1.3 and 3.2, respectively. For 5-, 12- and 15-year-old age groups dental caries levels were lower amongst children with fluoridated

domestic water supplies (all  $p < 0.0001$ ). The prevalence of dental fluorosis has increased in RoI since 1984. 23% and 36% of 8- and 15-year olds respectively in fluoridated areas had Dean's Index scores at the questionable or greater level in 2002, compared with 6% and 5% respectively in 1984. **CONCLUSIONS:** Caries levels are lower among children with fluoridated domestic water supplies. Decay levels are much lower in 2002 than they were in 1984 and in the 1960s. The oral health of the less well off is worse than that of the rest of the population. The prevalence of dental fluorosis is higher amongst children and adolescents with fluoridated water supplies. Comparisons with 1984 data show an increase in the prevalence of fluorosis since that time.

Authors: Whelton H, Crowley E, O'Mullane D, Donaldson M, Kelleher V, Cronin M.

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Keywords: Dental caries; Dental fluorosis; Fluoridated water; Republic of Ireland;

Source: Community Dent Health. 2004 Mar;21(1):37-44.

#### **FLUORIDE MOUTH-RINSING TO PREVENT DENTAL CARIES IN A BRAZILIAN MUNICIPALITY WITH FLUORIDATED DRINKING WATER**

**OBJECTIVE:** To compare the prevalence of dental caries in two groups of schoolchildren: (1) schoolchildren participating in a weekly 0.2% sodium fluoride mouth-rinsing program and (2) schoolchildren not participating in the program. **METHODS:** This cross-sectional study was conducted in the city (municipality) of Londrina, in the state of Parana, Brazil; the city has fluoridated drinking water. We examined 367 12-year-old children: 190 participants in the weekly mouth-rinsing program (51.8%) and 177 nonparticipants (48.2%). The prevalence of caries was determined based on the scores for decayed, missing, and filled teeth and for decayed, missing, and filled surfaces. The examinations were performed by three examiners, with nearly perfect agreement in their diagnosis of caries ( $\kappa = 0.90$ ). The dependent variable was dental caries. The independent variables were: participation or nonparticipation in the mouth-rinsing program, attending a private school or a public school, frequency of tooth-brushing, amount of toothpaste used, consumption of sweets between meals, and visits to the dentist. **RESULTS:** The decayed, missing, and filled teeth score (mean and standard deviation) at 12 years of age was  $0.85 \pm 0.059$  overall,  $1.0 \pm 0.058$  for program participants, and  $0.70 \pm 0.060$  for nonparticipants. The decayed, missing, and filled surfaces score (mean and standard deviation) was  $1.16 \pm 0.017$ , with it ranging from a low of 0.34 in one private school to a high of 1.66 in one public school. Bivariate analysis showed an association between caries ( $P < 0.05$ ) and the following variables: attending a public school, participating in the mouth-rinsing program, and consuming sweets between meals more than once a day. In the multivariate analysis, attending a public school ( $P = 0.0004$ ) and consuming sweets ( $P = 0.001$ ) remained associated with the presence of caries. **CONCLUSIONS:** The weekly mouth-rinsing program was not associated with a decreased prevalence of caries, in either the public schools or the private schools. However, additional research is needed to assess the cost-effectiveness of fluoride mouthrinsing programs in populations with a higher prevalence of caries. Given the caries prevalence that we found in the schoolchildren whom we studied, the resources allocated to the fluoride mouth-rinsing program for them should probably be used to pay for other health-promotion activities with them.

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Keywords: Dental caries; Fluoridated drinking water; Mouthrinsing program; Private schools, Public schools; Sweet consumption.

Source: Rev Panam Salud Publica 2004 Apr; 15(4):256-61. [in Spanish].

### SEVERITY OF DENTAL CARIES AMONG 12-YEAR-OLD SUDANESE CHILDREN WITH DIFFERENT FLUORIDE EXPOSURE

The aim of this study was to assess the effect of fluoride on the severity of caries among children exposed to different concentrations of fluoride in the drinking water and living in rural areas in the Sudan. Permanently resident schoolchildren ( $n = 299$ ) aged 11–13 years from three villages were clinically examined under field conditions. The caries criterion was teeth in need of extraction or extracted; only molars were recorded. Dental fluorosis was scored on all buccal tooth surfaces by the Thylstrup and Fejerskov index. The fluoride concentrations of the drinking water were assessed in samples ( $n = 25$ ) collected from wells and households. Predictors of caries were assessed by logistic regression analyses. There was no significant difference regarding age and gender distribution between the areas ( $P > 0.05$ ,  $df = 2$ , Kruskal-Wallis test). The socio-economic conditions in these villages were presumed to be equal. Significantly different fluoride concentrations in the drinking water were verified by the severity of dental fluorosis. Children in Abu Delaig, drinking water with 1.0–2.0 mg fluoride/L (median = 1.8), had significantly higher caries prevalence (21% versus 8%) than in a 0.4 mg fluoride area. Area of residence was the only significant predictor for caries; odds ratio 3.7 for children in Abu Delaig compared with the low fluoride area. There was no difference in caries prevalence between the lowest and the highest fluoride (2.9 mg) area. This study failed to demonstrate an effect of fluoride in drinking water on caries experience when the end point was molars indicated for extraction or missing because of caries.

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Keywords: Abu Delaig, Sudan; Buccal tooth surfaces; Caries; Dental fluorosis; Logical regression analyses; Schoolchildren; Water fluoridation concentrations.

Source: Clin Oral Investig 2005 Jan 6;[Epub].

### CARIES PREVALENCE AND ITS RELATION TO WATER FLUORIDE LEVELS AMONG SCHOOLCHILDREN IN CENTRAL PROVINCES OF SAUDI ARABIA

**OBJECTIVE:** To determine dental caries prevalence and severity among primary and intermediate schoolchildren in Riyadh and Qaseem Regions, and to determine any correlation between dental caries and fluoride levels in drinking water. **DESIGN:** Cross-sectional. **METHODS:** 1,104 children; 431 (6-7-year-old) primary schoolchildren (249 in Riyadh and 182 in Qaseem) and 673 (12-13-year-old) intermediate schoolchildren (392 in Riyadh and 281 in Qaseem) were examined for dental caries utilising the WHO criteria for diagnosis of dental caries. **RESULTS:** In primary schoolchildren the prevalence of caries was 91.2% both in Riyadh and Qaseem. The mean dmft scores were similar in Riyadh (6.53, SD 4.30) and Qaseem (6.35, SD 3.83). Among the intermediate schoolchildren the prevalence of dental caries was slightly higher in Riyadh (92.3%) than Qaseem (87.9%). The mean DMFT score was higher in Riyadh (5.06, SD 3.65) as compared with Qaseem (4.53, SD 3.57) with marginal statistical significance ( $p = 0.057$ ). Among the primary schoolchildren there was statistically significant ( $p < 0.05$ ) difference in mean dmft scores at various fluoride levels with lowest dmft scores at the optimum water fluoride level (0.61–0.80ppm) and highest at two extremes, i.e., 0.0 to 0.3 ppm and  $> 2.5$ ppm, while in intermediate schoolchildren no significant difference in overall mean DMFT scores of children at various water fluoride levels could be found. **CONCLUSION:** The caries experience among the primary and intermediate schoolchildren in Riyadh and Qaseem was very high, and that there was no linear correlation between water fluoride level and caries experience in these children.

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Keywords: Dental caries; Qaseem and Riyadh, Saudi Arabia; Schoolchildren; Water fluoride levels.

Source: Int Dent J. 2004 Dec;54(6):424-8.

**CARIES-PREVENTIVE EFFECT OF SODIUM FLUORIDE MOUTHRINSES: A SYSTEMATIC REVIEW OF CONTROLLED CLINICAL TRIALS**

The Swedish Council on Technology Assessment in Health Care launched a project group in 1999 to systematically review and evaluate the existing literature on different caries-preventive methods. The aim of this article was to report the findings concerning the caries-preventive effect of fluoride mouthrinses (FMRs) in various age groups, with special reference to background fluorides. A systematic search in electronic databases for literature published between 1966 and August 2003 was conducted with the inclusion criteria of a randomized or controlled clinical trial, at least 2 years' follow-up, and caries increment in the permanent dentition (DeltaDMFS/T) as endpoint. Out of 174 articles originally identified, 62 met the inclusion criteria. These studies were assessed independently by at least two reviewers and scored A–C according to predetermined criteria for methodology and performance. The measure of effect was the prevented fraction (PF) expressed as percent. The level of evidence was based on 25 articles. The results revealed limited evidence (evidence level 3) for the caries-preventive effect (PF 29%) of daily or weekly sodium fluoride rinses compared with placebo in permanent teeth of schoolchildren and adolescents with no additional fluoride exposure and for a caries-preventive effect on root caries in older adults. Inconclusive evidence (evidence level 4) was found regarding the effect of FMRs in schoolchildren and adolescents exposed to additional fluoride sources such as daily use of fluoride toothpaste. No firm support for the use of FMRs was disclosed in a small number of studies designed for patients at caries risk. Furthermore, no association between the frequency of the rinses and prevented fraction or saved surfaces per year was found. In conclusion, this systematic review suggests that sodium fluoride mouthrinses may have an anti-caries effect in children with limited background of fluoride exposure, while its additional effect in children with daily use of fluoride toothpaste could be questioned. The need for further clinical trials to elucidate the effect of FMRs in risk patients and older adults is emphasized.

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Keywords: Caries preventive methods; Children; Electronic database search; Fluoride mouthrinses; Fluoride toothpaste.

Source: *Acta Odontol Scand* 2004 Aug;62(4):223-30.

**URINARY FLUORIDE LEVELS AND PREVALENCE OF DENTAL FLUOROSIS IN CHILDREN OF JHAJJAR DISTRICT, HARYANA**

A study was conducted in the Jhajjar district of Haryana to assess the fluoride excretion in the population exposed to environmental fluoride and efforts were being made to correlate the results with dental fluorosis. The mean fluoride concentration in drinking water samples of Bahadurgarh, Beri, Jhajjar, Matanhail and Sahalawas blocks of Jhajjar district were 2.05 mg/L, 2.14 mg/L, 2.05 mg/L, 2.14 mg/L, and 1.93 mg/L, respectively. The mean urinary fluoride concentration was 1.58 mg/L in Bahadurgarh, 1.48 in Beri, 1.50 in Jhajjar, 1.51 in Matanhail, and 1.56 in Sahalawas. The mean prevalence of fluorosis on the basis of stage of dental fluorosis was highest of yellowish brown type and on the basis of TSIF score, score 4 type fluorosis was highest in most of the blocks of Jhajjar district. The study revealed that more than 50% of the individuals were found to be affected with dental fluorosis in this district.

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Keywords: India; Dental fluorosis; Drinking water; Jhajjar district; Haryana, India; Urinary fluoride.

Source: *Indian J Med Sci.* 2003 Sep;57(9):394-9.

**THE CARIES BALANCE: THE BASIS FOR CARIES MANAGEMENT BY RISK ASSESSMENT**

Dental caries progression or reversal depends upon the balance between demineralization and remineralization. The 'Caries Balance' is determined by the relative weight of the sums of pathological factors and protective factors. Minimally invasive dentistry aims at the least possible removal of enamel or dentin, including reducing pathological factors and enhancing remineralization to avoid any removal of hard tissues. A structured caries risk assessment should be carried out based upon the concept of the caries balance. Following the risk assessment a treatment plan is devised which leads to the control of dental caries for the patient. The balance between pathological and preventive factors can be swung in the direction of caries intervention and prevention by the active role of the dentist and his/her auxiliary staff. Much is now understood about the mechanism of dental caries. We have known for a long time that demineralization of enamel, dentin or cementum is caused by organic acids that are generated by so-called acidogenic bacteria in the plaque when these bacteria feed upon fermentable carbohydrates (Silverstone, 1973; Featherstone, 2000; Loesche, 1986). The natural repair process is remineralization, which occurs when the pH rises again and calcium and phosphate from saliva together with fluoride enter the subsurface region of the lesion and form a new veneer on the existing crystal remnants in the lesion (Ten Cate and Featherstone, 1991). This veneer is less soluble than the original mineral and resists further acid attacks. The key to improved dental health for all is now for the dental profession to embrace this knowledge and put it into practice in the real world, to inhibit caries formation and progression, and to enhance the natural repair process.

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Keywords: Acidogenic bacteria; Calcium; Cementum; Demineralization; Dental caries; Dentin; Enamel; Fluoride; Phosphate; Remineralization.

Source: Oral Health Prev Dent 2004;2 Suppl 1:259-64.

**PLAQUE FLUORIDE CONCENTRATIONS IN A COMMUNITY WITHOUT WATER FLUORIDATION: EFFECTS OF CALCIUM AND USE OF A FLUORIDE OR PLACEBO DENTIFRICE**

The results of a recent study by Whitford et al. [*Caries Res* 2002;36:256-265] with subjects whose drinking water was fluoridated led to two major conclusions: (1) Compared to the use of a placebo dentifrice, plaque fluoride concentrations ([F]) throughout much of the day are not significantly increased by the use of an F dentifrice but (2) they are positively related to plaque [Ca] ( $p = 0.0001$ ). The present double-blind, double-crossover study with 16 subjects used the same protocol and was done to: (1) determine the effects of the use of an F dentifrice on salivary and plaque [F] in a community without water fluoridation and (2) further examine the relationship between plaque [Ca] and [F]. Following the use of an F dentifrice or placebo for one week, whole saliva and plaque were collected 1.0 and 12 hr after the last use of the products. The study was repeated to include rinsing with a 20 mmol/L  $\text{CaCl}_2$  solution immediately before the use of the dentifrices. The  $\text{CaCl}_2$  rinse had only minor effects on salivary [Ca] and [F] and none on the plaque concentrations. Unlike the results found in the fluoridated community, all salivary and plaque [F] associated with the use of the F dentifrice were significantly higher than those associated with the use of the placebo. The results suggest that the cariostatic effectiveness of an F dentifrice should be greater in areas without water fluoridation. As noted previously, plaque [F] were positively related to plaque [Ca] ( $p = 0.0001$ ).

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Keywords: Calcium; Mouth rinsing; Placebo dentifrice; Plaque fluoride concentration; Salivary fluoride; Water fluoridation.

Source: *Caries Res* 2005 Mar-Apr;39(2):100-7.



**HEALTH/TOXIC EFFECTS IN ANIMALS****PHYSIOLOGY OF ANABAENA KHANNAE AND CHLOROCOCCUM HUMICOLA UNDER FLUORIDE STRESS**

Sodium fluoride showed pH-dependent physiological responses in the two test microalgae *Anabaena khannae* and *Chlorococcum humicola*. *A. khannae* showed severe membrane damage with fluoride at low pH with leakage of pigments and electrolytes. Annihilation of photosynthesis along with inhibition in <sup>14</sup>C uptake was observed at pH 6 with 50 mg/L fluoride. While respiration was less affected in the cyanobacterium, *C. humicola* showed 30% inhibition in respiratory activity. Resistance of *C. humicola* to fluoride toxicity has been attributed to the hindrance provided by the thick cell envelope, intracellular compartmentation and increase in extracellular pH as a consequence of its metabolism.

Authors: Bhatnagar M, Bhatnagar A.

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Keywords: Membrane damage; Metabolism; Microalgae; Photosynthesis; Sodium fluoride.

Source: Folia Microbiol (Praha) 2004;49(3):291-6.

**EFFECT OF FLUORIDE INTOXICATION ON LIPID PEROXIDATION AND ANTIOXIDANT STATUS IN EXPERIMENTAL RATS**

Fluoride is a potent enzyme poison. Thirty ground water samples from Vellore District, Tamil Nadu, India were analyzed for fluoride content, and it was revealed that the fluoride content of 24 samples were over and above the permissible limits. In the present study, the experimental rats were orally treated with 25 ppm of fluoride/rat/day for 8 and 16 weeks, respectively, and the levels of lipid peroxidation and antioxidant enzymes were studied to evaluate fluoride intoxication. An increase in the level of lipid peroxides along with a concomitant decrease in the activities of superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx) and reduced glutathione content were observed in fluoride administered groups of rats. The altered antioxidant status may be attributed to the increased generation of free radicals.

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Keywords: Antioxidant enzymes; Catalase; Fluoride intoxication; Free radicals; Glutathione peroxidase; Lipid peroxidation; Rats; Superoxide dismutase; Vellore district, Tamil Nadu, India; Water samples.

Source: Toxicology. 2004 Nov 15;204(2-3):219-28.

**THE EFFECT OF OVERDOSE FLUORIDE ON THE PROLIFERATION AND APOPTOSIS OF RAT'S INCISOR AMELOBLAST**

**OBJECTIVE:** To observe the effect of overdose fluoride on the proliferation of rat's incisor ameloblast. **METHODS:** 20 Wistar rats were divided randomly into 2 groups: Group I (Control); Group II 50 mg F<sup>-</sup>/L were given. After 8 weeks treatment, the AgNORs stain and TUNEL technique were applied to analyze the effect of fluoride on the proliferation and apoptosis of ameloblasts. **RESULTS:** The imaging analysis results showed that proliferation of pre-secretion ameloblasts were inhibited in group II as compared with the control group (p < 0.001). There was significant increase of apoptosis with the trend of migration toward secretion stage. **CONCLUSION:** The mechanism of fluorosis mottled enamel may be the effect of overdose fluoride with inhibits proliferation and induces apoptosis of ameloblasts resulting in dysfunction of secretion or absorption of enamel matrix proteins.

Authors: Sun HC, Liu M, Ouyang J, Li GS.

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Keywords: AgNORs stain; Ameloblasts; Apoptosis; Enamel matrix proteins; Incisors; Mottled enamel; Rats; TUNEL technique.

Source: Zhonghua Kou Qiang Yi Xue Za Zhi. 2003 May;38(3):217-9. [in Chinese]

### CORRECTIONS

A moratorium on silicofluoride usage will save \$\$millions by Masters RD in *Fluoride* 2005;38(1):1–5.

On p. 5, in note 5, the pages for the article by Jay Seavey should be p.11–22 rather than p. 6–17.

Water fluoridation and crime in America by Seavey J in *Fluoride* 2005;38(1):11–22.

On p. 20 the page on which to see the Figure should be p.17 rather than p.12.

Toxic effects of fluoride by maternal ingestion on kidney function of adult mice and their suckling pups by Bouaziz H, Ghorbel H, Ketata S, Guermazi F, and Zeghal N in *Fluoride* 2005;38(1):23–31.

On p. 24 the equation should be for creatinine clearance rather than creatine clearance.

Occlusal disharmonies of primary dentition in a high and a low fluoride area of Turkey by Kırzıoğlu Z, Sağlam AMŞ, and Şimşek S in *Fluoride* 2005;38(1):57–64.

On p. 59 the legend to the Figure should have been “Definitions and criteria of primary dentition occlusal disharmonies” rather than ending with the word occlusal.

Offprints in *Fluoride* 2005;38(1):90.

The example should have referred to 50 copies of a 5-page offprint rather than 50 pages.

Tribute to John Colquhoun by Spittle B in *Fluoride* 1999;32(3):134–6.

On p.136 the author of the poem *Wanderer's Night Song* should have been the German poet Johann Wolfgang von Goethe rather than Franz Schubert who set it to music. We thank Prof Dr med habil Jürgen Franke for pointing out this error. Prof Franke noted the poem was written on the Kickelhahn-hill in the Thuringean Mountains about 40 km from his home-city Erfurt in 1780 and that Goethe usually lived at Weimar about 20 km from Erfurt.

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### FIFTH ANNOUNCEMENT: XXVITH CONFERENCE OF THE INTERNATIONAL SOCIETY FOR FLUORIDE RESEARCH

A warm welcome is extended for attendance at the XXVIth conference of the International Society for Fluoride Research in Wiesbaden, Germany, September 26–29, 2005.

Abstracts and early bird registration payments are due on June 1, 2005.

Further information is available in *Fluoride* 2005;38(1):6–10 and at <http://homepages.ihug.co.nz/~spittle/fluoride-journal.htm>.

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