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FLUORIDE, official journal of the International Society for Fluoride Research, publishes quarterly reports on biological, chemical, ecological, industrial, toxicological and clinical aspects of inorganic and organic fluoride compounds.

MANUSCRIPTS, including papers presented at ISFR conferences, are accepted for publication after appropriate evaluation and recommendation by qualified reviewers (see Instructions to Authors inside back cover).

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FLUORIDE Editor, 216 Atkinson Road, Titirangi, Auckland 7, New Zealand.

EDITORIAL-MANAGERIAL ANNOUNCEMENT

(written April 1992)

When in 1991 we in New Zealand took on the responsibilty of editing and producing FLUORIDE from January 1992, we did not anticipate the financial, health and other difficulties, and resulting delays, encountered by our colleagues in Michigan USA where the journal has been produced since 1968. This last, No.4, issue of Volume 24 1991 has been produced in the New Zealand Editorial Office and accompanies Volume 25 No.2 1992. So both these issues appear in the Southern Hemisphere "Fall". Because of the delay in its appearance, this last issue for 1991 is limited to some abstracts and the usual No.4 Cumulative Volume Index. The papers unpublished in 1991 will be published in enlarged No.3 and No.4 issues of Volume 25 1992.

It is appropriate to here thank the people in USA who have rendered their services to the Society and its journal. Foremost among them is Edith Waldbott, widow of our highly respected founding member and editor Dr George L Waldbott. No words can adequately describe her magnificent contribution, first as the ally and helper of her husband and in recent times as Interim Editor.

Professor Albert Burgstahler of Kansas also deserves special mention. His services also go back many years, but as Acting Editor since Dr Waldbott's death he has given even more of his time, energy and talent despite heavy teaching and research loads. During 1991 in particular the load he bore must have been almost unbearably heavy.

Mrs Waldbott's daughter Betsy Ramsay deserves thanks for taking on the unenviable job of Interim Business Manager although heavily committed to other worthy causes.

Thanks should go also to Michigan printer, Arden McClure. The technical quality of the journal improved markedly during the years he printed it. During 1991 he persisted despite misfortunes and frustrations. His years of fine service should be remembered.

We thank especially Len Greenall of British Columbia, Canada, for his generous donations which have ensured the journal's continuation and improvement. Others, too numerous to mention here, have also sent donations and messages of goodwill. To all of you our sincere thanks.

We request the cooperation of all members in our own new task. Please continue to submit reports of your research, and write to us with suggestions and criticisms. Brief Reports and Letters to the Editor will enliven the journal and are especially welcome.

John Colquhoun, Editor Johannes M Caris, Manager

216 Atkinson Road, Titirangi, Auckland 7, New Zealand

The year 1991 marks the end of the period in our journal's history when it was edited and published in Michigan, USA (see Announcement on preceding page). The year also saw the launching of an important new journal, *Environmental Sciences*, under the editorship of our Society's President, Professor H Tsunoda (Iwate Medical University, 19-1 Uchimaru, Morioka 020, Japan). The following is from his opening editorial:

"I have been studying the effects of air pollution on health since 1958, specializing in the health effects of environmental pollution due to carcinogenic hydrocarbons and fluoride. I myself had difficulty pursuing this research because of the paucity of available journals and information. Therefore, I was forced to turn to journals in fields with some relevance to these pollutants, including analytical chemistry, agricultural chemistry, veterinary sciences, and oncology, as well as environmental health and industrial hygiene.

Later, with improved international scientific communication, more information on environmental research covering a wide variety of scientific fields became available through journals published in the industrialized nations of the West. The information helped Japanese environmental science researchers expand their studies substantially, which eventually contributed to environmental improvements in Japan.

I have recently felt, however, that environmental science has branched out into various scientific fields and can be subdivided into a number of related fields. It seems that the diversity of materials covered has resulted in researchers experiencing great difficulty in comprehending papers which are not in their specialities. Therefore, although environmental science is really an interdisciplinary field, there is a genuine requirement for journals which focus on specialized issues.

Hence, sensing the need for a new type of environmental scientific publication, we have decided to launch this journal, *Environmental Sciences*, whose scope will be limited to biological and toxicological effects of pollution on living systems."

The decision to hold the next (19th) ISFR Conference in Japan in 1992 was made at the 18th Conference held at Humboldt State University, Arcata, California, in August 1990. At the usual business meeting of ISFR members held during that Conference the gratitude and thanks of all participants to Dr C James Lovelace, Secretary General of the Conference, were expressed by the Society's President, Dr A K Susheela. The Society's Secretary, Dr Gene W Miller, read the minutes of the preceding, 17th, Conference which had been held the previous year in beautiful Budapest, Hungary, under the able organization of Dr Miklos Bély. Dr Albert Burgstahler, of Kansas, read the Treasurer's report. New Officers unanimously elected at the meeting were: President, Dr H Tsunoda; Vice-President (President-Elect), Dr Ming-Ho Yu; Second Vice-President, Dr Miklos Bély. Dr Miller was re-elected Secretary. Dr Gottfried Dominok invited members to meet in Cottbus, Germany, in late 1993 or 1994. The members voted to accept that invitation. Chinese delegates expressed their desire to host a Conference in the future. Discussion took place on the Society's journal, *Fluoride*, and the reasons for its continued exclusion from *Index Medicus*. The Officers agreed to meet, discuss the validity of some criticisms of the journal, and submit a report to members. In the view of some members, the exclusion of our journal from *Index Medicus* (a publication of the United States Public Health Service) for no apparently valid reason, is in effect a form of censorship, affecting the amount of information on fluoride pollution and toxicity which reaches health professionals in the English-speaking world. The matter will undoubtedly be aired again at the forthcoming Conference.

John Colquhoun

OBSERVATIONS ON FLUOROTIC AORTOSCLEROSIS BY TWO-DIMENSIONAL ECHOCARDIOLOGY

Song Ai-hua, Wang Tian-yun *et al.*
Gansu, People's Republic of China

(Abstracted from **Endemic Diseases Bulletin**, 5:94, 1990)
[in Chinese, summary and tables in English]

Forty-six patients with endemic fluorosis (4 age groups) were examined by two-dimensional echocardiography (2 DE) with 92 normals (2 groups) from both endemic and normal areas as controls. All patients' aortic walls were peripherally thickened to a range from 7.5 to 9.8 mm, which failed to correlate with age and course. In the fluoric group, the number of cases with increased echoes more than medium on the aortic walls was 37 (79.8%); in control Group I, four (8.7%) and in control Group II, none. The amplitude of the aortic root pulse observed by M-mode echo in the fluoric group was 5.91 ±1.40 mm, clearly smaller than the control groups ($p < 0.01$). The thickness of LPVW of fluorosis patients in the 2 age groups of 31-40 and 41-50 was much greater than those of the control groups ($p < 0.01$). No difference was found in the thickness of other items of all 3 groups.

This study suggests that endemic fluorosis might cause aortosclerosis, which greatly aggravates the course and range of sclerosis and calcification of the conducting arteries and in turn causes severe fluorosis. The term "fluoric aortosclerosis" is proposed and its physiopathologic mechanism discussed.

KEY WORDS: Echocardiography; Endemic fluorosis; Fluoric aortosclerosis.

REPRINTS: People's Hospital of Zhangyne District, Gansu 734000, People's Republic of China.

ACUTE FLUOROSIS OF THE MOUSE MESENTERIC VASCULAR BED

Liu Yi, Fei Mei-li and Zhang Xiao-ying
Urumqi, People's Republic of China

(Abstracted from **Endemic Diseases Bulletin**, 4:4, 1989)
[in Chinese with summary and tables in English)

Five hours after the mesenteric microvessels of the mice were poisoned by LD_{50} dose of sodium fluoride (NaF), the contractive reactivity of the fine arteriole and venules was nearly normal to both 10% and 1% noradrenaline (NE). The two kinds of microvessels still had clear contractive reactivity to NE after 1.5-60 h. Reactivity, however, was lower than normal and varied with the kinds of mesenteric microvessels and levels of NE.

KEY WORDS: Fluorosis; Mesenteric microvessel; Mice; Noradrenaline; Reactivity; Sodium fluoride.

REPRINTS: Department of Physiology, Xinjiang Medical College, Urumqi, People's Republic of China.

PRELIMINARY STUDIES ON FLUORIDE ANALYSIS WITH ADDITION OF FLUORIDE TO ANALYTIC SOLUTION

Wang Lian-fang, Sun Xing-zhi and Yang Yang
Urumqi, Peoples Republic of China

(Abstracted from **Endemic Diseases Bulletin**, 4:14, 1989)
[in Chinese, abstract and tables in English]

A new method for fluoride analysis with the fluoride electrode for a low-fluoride sample is reported. A dosage of 2.0 µg F^- fluoride is added to 4 mL analytical solution (TISAB 2.0 mL, sample 1.0 mL distilled water 1.0 mL). Both values of millivolt are read before and after, and their difference (Δ mv) is calculated. With the results of Δ mv of each standard point, a standard graph on semilogarithmic paper can be made for calculation of the fluoride content. The relationship between the Δ mv and the fluoride level was linear in semilogarithmic graph when 0.04-1.0 µg was the fluoride content range. the coefficient of variation of Δ mv on each standard point (0.05, 0.10, 0.5, 1.0 µg F^-) was 0.74-1.78% tested within 10 days. The recovery rate of standard fluoride added to the sample was 96.0-106.0% in seven samples. By this new method Mg^{++} interference which occurs with Nenst's method was avoided.

KEY WORDS: Adding method; Fluoride analysis; Recovery rate.

REPRINTS: Xinjiang Institute for Endemic Disease Control and Research, Urumqi, People's Republic of China.

ANALYSIS ON THE SERUM F^-/Ca^{2+} RATIOS OF 105 PATIENTS WITH ENDEMIC SKELETAL FLUOROSIS

Li Xiao-xia, Tian Jian-ying, Wang Zhen-you, Du Ming-xuan, Zhou Zhen, Tian Gui-yin, Tang Feng-xia
Hebei, People's Republic of China

(Abstracted from **Endemic Diseases Bulletin**, 5:68-69, 1990)
[in Chinese with summary and tables in English]

The mean value of serum F^-/Ca^{2+} ratio for 105 fluorosis patients was 0.028 ±0.015; normal controls in Tianjin differed significantly (0.011 ±0.002). The F^-/Ca^{2+} ratios between the areosis type and sclerotic type were likewise statistically different. However, differences were found between the mixed type and areosis or sclerotic types respectively. The F^-/Ca^{2+} ratio also decreased as the pathological changes (detected by X-rays) worsened for areosis type; the sclerotic showed the opposite; fluctuations for mixed type were not significant.

The study suggested that serum F^-/Ca^{2+} ratio can be an indicator of skeletal lesions in the fluorosis patient.

KEY WORDS: Calcium; Endemic fluorosis; Fluoride/calcium ratio; Serum calcium; Serum fluoride; Skeletal fluorosis.

EFFECTS OF NaF ON SOFT TISSUE STRUCTURE OF RABBITS

Li Jing-xi and Wang Jun-dong
Xinxiang City, Peoples Republic of China

(Abstracted from **Endemic Diseases Bulletin**, 4:8, 1989)
[in Chinese, abstract and tables in English]

To observe structural changes in bone and soft tissue (cardiac and skeletal muscles, cerebrum, ren, hepar and testicles or ovary) 40 rabbits were subjected for 100 days to sodium fluoride in the amounts of 0 mg (Group A), 15 mg (Group B), 30 mg (Group C) and 60 mg (Group D) per kg body weight per day, respectively. F^- level of incisor and ossacuboideum of dosed animals was obviously higher than that of controls (Group A); no osseous structural change or damage was observed. In contrast, cardiac and skeletal muscles were partially degenerated histologically. Particularly, the ultrastuctural injuries present a picture of involved unit membranes and mitochondria, accompanied by erosion, and emergence or partial disappearance of microfibres. No visible structural change was observed in liver, kidney, or other soft tissues.

New data in current experimental studies may indicate that the dosed animals have structural injuries caused by the direct effects of sodium fluoride on soft tissues prior to emergence of osteofluorotic bone and teeth.

KEY WORDS: Bone; F^- level; NaF; Rabbits; Soft tissue.

REPRINTS: Henan Vocational-Technical Teacher's College, Xinxiang City, People's Republic of China.

DELETERIOUS EFFECT OF SODIUM FLUORIDE ON GASTROINTESTINAL TRACT

A. Fujii and T. Tamura
Chiba, Japan

(Abstracted from **Gen. Pharmacol.**, 20:705-710, 1989)

A single oral dose (300 mg/kg) of NaF caused blood flow rate in rat stomach mucosa to be only 30% of the intitial rate during 30-60 min. Addition of NaF (final NaF concentration: 50 and 100 ppm) in vitro caused 10 to 28% reduction, respectively, of initial free calcium ion levels in rat blood. These results indicate that oral ingestion of excess amount of NaF caused dilation of blood vessels and greatly decreased blood flow rate to accumulate the circulating blood in the mucosa of gastrointestinal tract and to cause redness.

KEY WORDS: Gastrointestinal tract; Rats; Sodium fluoride; Stomach mucosa.

REPRINTS: Department of Pharmacology, Nihon University School of Dentistry, Chiba, Japan

FLAWED FOUNDATION: A RE-EXAMINATION OF THE SCIENTIFIC BASIS FOR A DENTAL BENEFIT FROM FLUORIDATION

John Colquhoun
Auckland, New Zealand

(Abstract from **Community Health Studies** 288-296, 1990)

The scientific basis for a dental benefit from water fluoridation is critically examined. Professional responses and the "mind set" about fluoridation are described and discussed.

KEY WORDS: Dental caries; Dental fluorosis; Fluoridation controversy; Fluoridation trials; Fluoridation, social science studies; Fluoride-caries relationship; Professional mind set.

REPRINTS: Dr John Colquhoun, 216 Atkinson Road, Titirangi, Auckland 7, New Zealand.

SECOND ASSESSMENT OF LONDON CHILDREN INVOLVED IN A SCHEME OF DENTAL HEALTH EDUCATION IN INFANCY

R.D. Holt, G.B. Winter, B. Fox and R. Askew
London, England, UK

(Abstracted from **Community Dent. Oral Epidemiol.**, 17:180-182, 1989)

In the mid-1970's dental health education was provided by means of home visits to mothers with young children and free fluoride supplements were offered to mothers in two of the three groups taking part. In the 10th year, 126 of the children were examined for caries and gingivitis. Few statistically significant results were seen in this small sample remaining from the scheme. Trends for better dental health among children whose mothers had been visited at home, found in a previous assessment, were seen again here.

KEY WORDS: Dental education; Dental health; Fluoride supplement; London.

REPRINTS: Dept. of Children's Dentistry, Eastern Dental Hospital, London, UK.

ISOFLURANE INHIBITS ENFLURANE METABOLISM IN MAN

M.P. Oikkonen
Helsinki, Finland

(Abstracted from **Anaesthesia**, 44:763-764, 1989)

Halogenated inhalation anaesthetics interfere with each other's hepatic microsomal metabolism. The increase in plasma inorganic fluoride concentration, caused by the metabolism of a standardized dose of enflurane, was attenuated by isoflurane given either before or after the enflurane exposure. It is concluded that isolurane inhibits the metabolism of enflurane in man, a fact that might be advantageous in certain situations.

KEY WORDS: Anaesthetics; Enflurane metabolism; Isoflurane metabolism.

REPRINTS: Department of Anaesthesia, Otolaryngological Hospital, Helsinki, Finland.

ON DENTAL HEALTH IN ICELANDIC CHILDREN. OBSERVATIONS DURING A CLINICAL DENTRIFRICE TRIAL.

S. Bjarnason
Goteborg, Sweden

(Abstracted from Swed. Dent. J. Suppl., 57:1-40, 1989)

Dental health and the relative caries preventive effect of different fluoride dentifrices were assessed in an Icelandic child population. Standardized methods were employed to examine 1370 children, aged 11 and 12 years for caries and periodontal conditions. Longitudinal data were obtained from 1161 children, participating in a three-year dentifrice trial. Randomly selected subgroups were employed to study salivary levels of mutans streptococci and lactobacilli, consumption of high-sucrose products and enamel fluoride content in relation to caries experience. Relative caries preventive effect of anticalculus agents (HEBP and AHBP) and lowered fluoride concentration (250 ppm) in dentrifrices were evaluated in a three-year, double blind, randomized clinical trial. At the baseline examination a comparatively high mean caries prevalence (DFS 9.9) was registered. Longitudinal observations showed a mean caries increment of 10.5 surfaces during a three-year period. Simultaneously an improvement of gingival health was observed.

A majority of chidlren harbored mutans streptococci (98%) and lactobacilli (92%). High numbers of either microorganism were associated with high caries prevalence. S. sobrinus cariers were more frequent among children with high numbers of CFU per mL saliva. Consumption of sugar-containing products was generally frequent. Higher caries increment was associated with consumption of sweets and bakery products during mealtimes. A comparatively low fluoride content of surface enamel reflected the scarce post-eruptive exposure. Caries preventive effect of dentifrice containing 250 ppm fluoride was significantly lower compared to 1000 ppm sodium fluoride and MFP formulations. Addition of anticalculus agents (biphosphates) failed to affect adversely reduction of caries increment.

According to these studies dental caries constitutes a major health problem among Icelandic children, where high sugar consumption and comparatively low exposure to fluoride appear to play major roles. Use of fluoride dentifrice failed to limit caries development.

KEY WORDS: Dental caries; Fluoride dentifrices; Iceland (children).

REPRINTS: Dept. of Pedodontics, Faculty of Odontology, University of Goteborg, Goteborg, Sweden.

THE CARIES INCIDENCE IN SCHOOLCHILDREN IN THE CANTON OF GLARUS 13 YEARS AFTER THE INTRODUCTION OF HIGHLY FLUORIDATED SALT

M. Steiner, G. Menghini and T.M. Marthaler
Zurich, Switzerland

(Abstracted from Schweitz Monatsschr. Zahn Med., 99:897-901, 1989)

Addition of 250 ppm fluoride to domestic salt and salt used by bakeries was begun in 1974-1976 in the Canton of Glarus. Caries examinations revealed a rapid decline of DMFT averages in the four age groups (8, 10, 12, 14 years) by 71 to 78% from 1974 to 1987. DMF counts in fissures and pits also decreased by 61 to 80%. In the primary dentition, the number of sound teeth and of sound approximal molar surfaces increased. The average fluoride levels in urinary spot specimens was 0.36 ppm in 1974 and varied between 0.74 and 0.80 ppm from 1979 to 1987. In autumn 1982 toothbrushing exercises with fluoride preparations were introduced. They were discontinued in 1983 and 1984 in part of the communities, the main decline having occurred from 1974 to 1983. The reduction from 1974 to 1987 was too high and too rapid to be exclusively due to the fluoride in salt but other factors changed little. The percentage of fluoride dentifrice rose only slightly and Swiss averages of sugar and sweet consumption remained almost stable from 1976 to 1987.

KEY WORDS: Caries incidence; Dental caries; Fluoridated salt; Swiss schoolchildren.

REPRINTS: Department of Cariology, Periodontology, and Preventive Dentistry, Institute of Dentistry, University of Zurich, CH-8006 Zurich, Switzerland.

DEATH DUE TO HYDROFLUORIC ACID

A. Chela, R. Reig, P. Sanz, E. Huguet and J. Corbella
Barcelona, Spain

(Abstracted from Am. J. Forensic Med. Pathol., 10:46-48, 1989)

A young woman who had acid thrown onto her face died a few hours later from acute respiratory insufficiency, due to inhalation of acid vapors. The autopsy revealed severe chemical burns of skin and lungs, with intense pulmonary hemorrhage edema caused by the acid and its vapor. Chemical-toxicological analysis confirmed that deat was due to hydrofluoric acid.

KEY WORDS: Fluoride fatality; Hydrofluoric acid; Pulmonary hemorrhage.

REPRINTS: Institute of Forensic Medicine, School of Medicine, University of Barcelona, Bacelona,, Spain.

EXPERIMENTAL STUDIES ON FLUOROSIS IN THE LAMB

G. Milhaud, Françoise Rivière and Brigitte Enriquez
(avec la collaboration technique de Eliane Charles et Thérèse Gonichon)
Maisons-d'Alfort, France

(Abstract from Ann. Rech. Vet. 16:369-377, 1985)

Eighty-four lambs weaned at birth were randomised to three groups, each of 28 animals. The amount of fluoride contained in the feed was carefully assessed. Two groups were administered with sodium fluoride. The dose was calculated so as to administer a quantity of fluoride close to the quantity that lambs would ingest in consuming alfalfa containing from 125 to 250 ppm fluoride. The daily amount of fluoride administered to the first group rose progressively between week 3 and week 8 from 0.45 to 2 mg/kg/day, then remained fixed until the animals were slaughtered. Group 2 received double amounts: from 0.90 mg/kg/day to 4 mg/kg/day between week 3 and week 8, at which level the amount was fixed. The treatment had no effect on the growth of the lambs: at week 17 their average weight was about 29 kg. Plasma levels of ionic fluorine rose steadily up to week 9, at which they remained fixed at about 0.40 mg/l in group 1 and 0.75 mg/l in group 2, whereas they ranged between 0.10 and 0.15 mg/l in the controls. Ionic fluorine averaged 28% of the total fluoride in the controls, 42% in group 1 and 47% in group 2. Fluoride levels in the bones were very high (up to 2760 ppm in the mandibles in group 2). Reversely, fluoride levels in the muscles were very low: 1.00 ppm in group 2. The biochemical parameters calcium, phosphorus, magnesium, transaminases, phosphatases and γ-glutamyl transferases greatly varied in relation to the age of the animal but were not affected by fluoride intake.

KEY WORDS: Fluorosis; Lamb; Sodium fluoride.

REPRINTS: Laboratoire de Pharmacie et Toxicologie, Ecole Nationale Vétérinaire d'Alfort, 94704 Maison-Alfort, France.

DENTAL CARIES AND FLUOROSIS IN CHILDREN FROM HIGH AND LOW FLUORIDE AREAS OF MOROCCO

T. Haikel, P.M. Cahen, J.C. Turlot and R.M. Frank
Strasbourg, France

(Abstracted from ASDC J. of Dentistry for Children, 56:378-381, 1989)

The purpose of this study was to estimate the prevalence and the severity of dental caries and dental fluorosis in primary and permanent teeth of 582 subjects, ages 7 to 16 years, from the fluorosis area of Khouribga and the non-fluorosis area of Beni Mellal, Morocco. In the age group 7-10, where 67.8% of primary teeth were present, about 35% of the children were affected in the high-fluoride area, and the community fluorosis index was 0.86. The percentage and average number of erupted permanent teeth were higher in Beni Mellal than in Khouribga for 11-12- and 13-14-year-old age-groups. Significant differences in caries prevalence were observed between the high- and low--fluoride areas. In both regions, high and low prevalence of dental caries was observed in the primary and permanent teeth, respectively.

KEY WORDS: Dental caries; Endemic fluorosis; Morocco.
REPRINTS: Prof. T. Haikel, University of Strasbourg, Faculty of Dentistry for Children, F-67070, Strasbourg, France.

FLUORIDE CONCENTRATIONS IN A COLLECTION OF URINARY CALCULI

by

M.A.E. Wandt* and A.L. Rogers
Faure, South Africa

(Abstracted from **The Journal of Urology**, 138:664-647, 1987)

Since the advent of fluoridated drinking water in the 1950's there has been much controversy over the possible role of fluorine in the genesis of urolithiasis. By means of a microdifussion procedure, mean fluoride values of 42 urinary calculi were determined. They were 56, 230 and 1112 ng/mg fluoride for uric acid, calcium oxalate monohydrate and apatite/struvite stones, respectively. Fluoride concentration was related to calcium oxalate dihydrate levels as well as to apatite content. The former has zeolithic properties which might trap fluoride, whereas formation and growth of the latter appears to be enhanced by elevated urinary fluoride levels.

In the present study, calcium oxalate calculi have higher fluoride concentrations than uric acid and urate stones. The calcium oxalate calculi containing monohydrate as the major constituent have lower fluoride content than those stones containing a mixture of both hydrates (calcium oxalate monohydrate and calcium oxalate dihydrate). Furthermore, when the dihydrate is the only calcium oxalate phase present, the fluoride concentration is even higher (stones 281 and 319). (The most prevalent additional constituent in these calculi is apatite).

Apatite, the most abundant of the phospate minerals, is contained in almost all calculi where it is commonly present at the surface and at the walls of pores within the stone. Fluorine fits readily into the lattice of the apatite molecule and fluoroapatite is markedly less soluble than hydroxyapatite. Even mere traces of fluoride (10^{-6} M — about $^{1}/_{50}$ of the concentration recommended for drinking water), alters the nature of the precipitate completely. Small quantities of fluoroapatite are likely to be formed and may aid in the deposition of further quantites of apatitic material. During remineralization of partly demineralized tooth enamel, there is a maximum value of the fluoride concentration gradient above which lesions cannot be successfully repaired. As apatite is one of the most frequently found major phases in kidney stones and octacalcium phosphate had also been reported as a constitutent, the above data suggest that elevated urinary fluoride levels enhance the formation and growth of apatitic concrements.

In general, crystallinity of bone apatite and carbonate apatite in urinary stones inceases significantly with increasing fluoride content. Thus the present study suggests that fluoride may be of some importance in urinary stone disease. Since the fluorine concentrations in drinking water and in calculi are directly related, concern is expressed regarding the additon of fluoride to drinking water.

KEY WORDS: Calcium oxalate; Fluoride; Urinary calculi; Urolithiasis.

REPRINTS: Council for Scientific and Industrial Research, National Accelerator Centre. Van de Graaff Group, ZA-7131 Faure, South Africa.

THE RESPONSE OF VERTEBRAL BONE MINERAL DENSITY DURING THE TREATMENT OF OSTEOPOROSIS WITH SODIUM FLUORIDE

A.B. Hodsman and D.J. Drost
London, Ontario, Canada

(Abstracted from J. Clin. Endrocrinol. Metab., 69:932-938, 1989)

Forty-eight female patients with postmenopausal osteoporotic vertebral compression fractures were treated with sodium fluoride and calcium supplements. Their response to treatment was documented by sequential measurements of vertebral and forearm bone mineral density (BMD). During treatment 25 patients developed significant side-effects due to fluoride, 18 patients (37%) were intolerant to the drug after 17.3 ±7.3 (±S.D.) months. Those remaining were followed for 29.4 ±9.6 months. By linear regression analysis 69% of patients who had a positive slope of vertebral BMD vs. time of greater than 0.0017 g/cm^2/month (range 0.0017-0.01) were classified as treatment responders. The increment in vertebral BMD above the baseline values over time was described by the relationship delta BMD (g/cm^2/month) = 0.042 + 0.0053 x months, which is equivalent to a rate of 8.4%/yr. Only 70% of responders were identified by 12 months. The total cumulative dose of sodium fluoride (31.3 ±16.4 g) was significantly higher in patients classified as responders than in the nonresponders (20.6 ±13.4 g; $p < 0.05$), probably because of differences in side-effects between the two groups. In contrast, forearm BMD fell significantly in responders by an average of 7.7%/yr., which suggested the possibility of a preferential improvement in axial bone density at the expense of cortical bone. Thus, the majority of patients treated with fluoride respond with increasing vertebral BMD. However, it may take 12-24 months to identify these individuals.

KEY WORDS: Bone mineral density; Fluoride therapy; Osteoporosis; Sodium fluoride; Vertebral bone density.

REPRINTS: Department of Medicine, St. Joseph's Health Centre, London, Ontario, Canada.

THE EFFECT OF FLUORIDE ON BONE AND IMPLANT HISTOMORPHOMETRY IN GROWING RATS

R.T. Turner, R. Francis, D. Brown, J. Garand, D.S. Hannon and N.H. Bell
Loma Linda, California, USA

(Abstracted from J. Bone Mineral Res., 4:477-484, 1989)

The effect of fluoride at concentrations of 2.0 and 4.5 mM in drinking water, on growth rate, vitamin D, water and mineral metabolism, bone histomorphometry, and osteoinduction of demineralized allogenic bone matrix (DABM) were compared in the rat. Fluoride failed to influence fluid intake or growth rate at the lower concentration. Fluoride produced dose-related increases in serum fluoride and alkaline phosphatase but did not alter serum 25-hydroxyvitamin D or 1,25-dihydroxyvitamin D. Serum calcium and phosphate were reduced by fluoride at concentrations of 2.0 mM but not 4.5 mM.

Cancellous bone fractional area was increased by fluoride at 2.0 mM and was reduced by fluoride at 4.5 mM. Fluoride failed to affect cancellous bone surface length or the percentage surface lined by osteoblasts and osteoclasts; fluoride increased medullary area and decreased the endosteal bone formation rate; it also increased periosteal bone formation and apposition rate at concentrations of 2.0 mM but not 4.5 mM. Fluoride inhibited mineralization in DABM implants; at higher concentrations, it increased formation of new bone matrix.

These results indicate that, in the rat, fluoride increases cortical and trabecular bone at therapeutic doses and reduces trabecular bone at toxic doses. The serum concentration of fluoride at therapeutic doses in the rat is similar to that in patients with osteoporosis treated with fluoride. In the rat, the range between the toxic and therapeutic doses is narrow.

KEY WORDS: Bone histomorphometry; Fluoride bone therapy; Rat bone studies.

REPRINTS: Department of Physiology and Pharmacology, Loma Linda University, Loma Linda, California, USA.

ISSUES IN THE ECONOMIC EVALUATION OF COMMUNITY WATER FLUORIDATION

B.A. White, A.A. Antczak-Bouckoms, M.C. Weinstein
Boston, MA, USA

(Abstracted from J. Dent. Educ., 53:646-657, 1989)

Community water fluoridation has long been considered an effective public health intervention for the prevention of dental caries. The recently documented secular decline in dental caries, however, presents for policy makers the challenge of appropriately allocating limited health care resources among a variety of health care programs. Appropriate economic assessment of these alternatives becomes critical for rational distribution of such resources. Cost-benefit and cost-effectiveness analyses are techniques that, when used correctly, can guide policy makers facing such decisions.

This paper reviews and critiques the published literature assessing the cost-effectiveness and cost-benefit of community water fluoridation using criteria developed for economic evaluation. Eight papers met the criteria for inclusion in the present study. In general, the articles failed to incorporate the declining prevalence of dental caries into their analyses and to document fully costs associated with water fluoridation, were not appropriately incorporated into the cost-effectiveness analysis, thereby overestimating the marginal cost associated with fluoridation. Specification of outcome measures to assess the consequences of water fluoridation failed to incorporate the dynamic nature of dental disease.

Suggestions for improving the generalizability and usefulness of future cost-benefit and cost-effectiveness analyses are made.

KEY WORDS: Cost-beneit; Declining dental caries; Economic assessment; Water fluoridation.

REPRINTS: Harvard School of Public Health, Boston, MA, USA

FLUORIDE EXPOSURE IN MICHIGAN SCHOOLCHILDREN

S.M. Szpunar and B.A. Burt
Ann Arbor, Michigan, USA

(Abstracted from J. Public Health Dent., 50:18-23, 1990)

Recent trends in the prevalence of dental caries in children, as well as the possible increase in the prevalence of dental fluorosis, have prompted a reassessment of the water fluoride level. Instead, an alternative approach would be to limit the use of, or reduce the fluoride concentration of dentifrices, mouthrinses, and supplements.

Based on data from a 1987 survey of Michigan schoolchildren, exposure to selected fluoride sources as well as toothbrushing habits are described. Responses from questionaires revealed that, overall, 98.5% of the children have used fluoride dentifrices, 27% have used topical fluoride rinses, 72.5% have had at least one exposure to professionally applied topical fluoride, and 27% have partaken of fluoride supplements. The percentage of children in the other communities who have ingested these supplements, suggest that these products are being perscribed improperly.

In view of the almost universal use of fluoride dentifrices, this may be the time to investigate the use of reduced fluoride dentifrices for children. In addition, continuing efforts to decrease inappropriate dietary supplementation are required.

KEY WORDS: Fluoride dentifrices; Fluoride exposure; Michigan schoolchildren; Mouthrinses.

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SKELETAL FLUOROSIS: A REPORT OF TWO CASES

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(Abstracted from **Orthopedics**, 11:1083-1087, 1988)

Two patients with skeletal fluorosis, who displayed radiographic changes, are presented. One patient demonstrated a progressive paraparesis; the other was diagnosed incidentally on routine radiographs. A review of the literature, treatment, and histologic findings are presented.

KEY WORDS: Radiographic changes; Skeletal fluorosis

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AUTHOR INDEX

SUBJECT INDEX

NEW INSTRUCTIONS TO AUTHORS

Papers should present original investigations. Review papers are also accepted.

1. **General.** The submitted paper, with a copy, should be written concisely in English. Either American or British spelling will be accepted. Double space with generous margins. Measures should be in metric system.

2. **Title.** A concise but informative title should be followed by the name(s) of the Author(s). The address where the research was carried out should appear at the bottom of the first page.

3. **Summary.** Begin with a brief factual summary.

4. **Key words.** List the major themes or subjects.

5. **Introduction.** State the reason for the work with a brief review of previous work on the subject.

6. **Materials and Methods.** Condense. However, if the methodology is new or developed by the author(s) it can be more detailed.

7. **Results.** List the direct conclusions of the work.

8. **Discussion.** Deal with general conclusions, referring to other work on the subject. In short papers Results and Discussion may be combined.

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10. **Acknowledgements.** Keep brief. They may include funding source, technical assistance, text editing and useful comments.

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