WATER AND TURF - FLUORIDATION AND THE 20TH-CENTURY FATE OF WATERWORKS ENGINEERS

E Hunt
Philadelphia, Pennsylvania, USA

Abstract from American Journal of Public Health 86 (9) 1310-1317 1996

Once central figures in American public health, waterworks engineers are no longer involved in many decisions made about the public water supplies. This paper argues that the profession's response to the early fluoridation movement of the 1940s and 1950s marked a change in the relationship between waterworks engineers and the other constitutive groups in public health and contributed to the disenfranchisement of the waterworks profession. Sensing a potentially divisive issue, two leaders of the profession, Abel Wolman and Linn Enslow, took steps they hoped would prevent a rift within the profession and allow waterworks engineering to continue its association with the wider public health community. Although the leaders saw the fluoridation issue differently, neither encouraged the profession to consider it openly or to take up the broader question of what limits, if any, should be placed on treating water supplies to meet human needs. Instead, they opted to locate authority for fluoridation outside the waterworks profession with dentists, doctors, and public health administrators. As a result, waterworks engineers conceded a great deal of the status and prestige associated with decision-making roles in community health issues and have largely faded from view.

Key words: Fluoridation; Waterworks engineers.
Reprints: E Hunt, University of Pennsylvania, Department of History and Social Sciences, 3440 Market St, Suite 500, Philadelphia, PA 19104, USA.

THE PLACE OF FLUORIDE SUPPLEMENTS IN CARIES PREVENTION TODAY

P J Riordan
Como, West Australia

Abstract from Australian Dental Journal 41 (5) 335-342 1996

There are very few scientifically good clinical trials of fluoride supplements, and those that can be considered methodologically adequate suggest that the contribution of fluoride supplements to caries prevention is slight. This may be partly a consequence of the fact that fluoride is much more widely available today than was the case a generation ago when fluoride toothpaste was not widely used and water fluoridation was not fully implemented. Although some families are conscientious in their use, compliance with fluoride supplement recommendations is generally poor over longer periods, making them a poor public health measure. There is substantial evidence that supplements cause dental fluorosis when used in accordance with recommendations for infants and small children. If the public becomes concerned about dental fluorosis as an aesthetic problem, all fluoride use may be put at risk. Supplements should no longer be recommended for caries prevention in children in areas with little fluoride in water but may be useful for persons with intractable caries risks. If supplements are recommended for children, a more cautious dosage schedule should be used. The fact that supplements have been recommended uncritically for many years on the basis of inadequate research raises questions about the standards of dental science.

Key words: Dental caries; Enamel mottling; Fluoride supplements; Prevention.
Reprints: P J Riordan, Dental Service, PO Box 50, Como, WA 6152, Australia.

Fluoride 30 (1) 1997
CIRCULATING TESTOSTERONE LEVELS IN SKELETAL FLUOROSIS PATIENTS
A K Susheela and P Jethanandani
New Delhi, India

Abstract from Journal of Toxicology - Clinical Toxicology 34 (2) 183-189 1996

Objective: The present study focuses on serum testosterone concentrations in patients with skeletal fluorosis, in order to assess the hormonal status in fluoride toxicity.

Methods: Serum testosterones were compared for patients afflicted with skeletal fluorosis (n = 30) and healthy males consuming water containing less than 1 ppm fluoride (Control 1, n = 26) and a second category of controls (Control 2, n = 16): individuals living in the same house as the patients and consuming same water as patients but not exhibiting clinical manifestations of skeletal fluorosis.

Results: Circulating serum testosterones in skeletal fluorosis patients were significantly lower than those of Control at p < 0.02. Testosterone concentrations of Control 2 were also lower than those of Control 1 at p < 0.05 but were higher than those of the patient group.

Conclusion: Decreased testosterone concentrations in skeletal fluorosis patients and in males drinking the same water as the patients but with no clinical manifestations of the disease compared with those of normal, healthy males living in areas nonendemic for fluorosis suggest that fluoride toxicity may cause adverse effects on the reproductive system of males living in fluorosis endemic areas.

Key words: Skeletal fluorosis; Testosterone.
Address: A K Susheela, All India Institute of Medical Sciences, Department of Anatomy, Fluoride and Fluorosis Research Laboratories, New Delhi 110029, India.

REVERSAL OF FLUOROSIS IN CHILDREN
S K Gupta, R C Gupta, A K Seth and A Gupta
Jaipur, India


Large populations consume fluoride-contaminated water, especially in developing countries. The toxic effects of fluorosis take three forms: clinical, skeletal and dental. Research thus far indicates that the manifestations of fluorosis are irreversible. However, it has been observed that the ingestion of calcium, vitamin C or vitamin D, individually, is effective in protection from fluoride toxicity to a certain extent. Therefore, a double blind control trial was conducted to examine the effect of a combination of calcium, vitamin D, and ascorbic acid supplementation in fluorosis-affected children. In the present study, 25 children were selected from an area consuming water containing 4.5 ppm. of fluoride. All the children were in the age group 6-12 years and weighed 18-30 kg. They were graded for clinical, radiological and dental fluorosis and relevant biochemical parameters. Grade I skeletal fluorosis and all grades of the manifestation of dental and clinical fluorosis were observed. The children were given ascorbic acid, calcium and vitamin D, well below the toxic dosages in a double blind manner.
using lactose as a placebo. Follow up revealed a significant improvement in dental, clinical and skeletal fluorosis and relevant biochemical parameters in these children. Thus, the study indicated that fluorosis can be reversed, at least in children, by a therapeutic regimen that is fairly cheap, simple and easily available and without any side effects.

Key words: Ascorbic acid; Calcium; Fluorosis; Vitamin D.

Reprints: S K Gupta, A-31 B Anita Colony, Jaipur 302015, Rajasthan, India.

INHALATION ANÆSTHETICS AND LIVER DAMAGE

R S Henderson
Wellington, New Zealand

Abstracted from Prescriber Update 13 6-7 1996

Halothane anaesthesia may cause liver damage which can be fatal. Halothane is contraindicated within at least 3 months of a previous administration, where jaundice or pyrexia followed any previous use, and in those with a family history of hepatic reactions following halothane. Other volatile anaesthetic agents are best avoided in the presence of risk factors for halothane-induced hepatitis.

Recently the Medicines Adverse Reactions Committee reviewed two cases of hepatic reactions following halothane anaesthesia. Both patients had received halothane (trade name Fluothane) previously. For one patient the timing of the previous dose was unclear, for the other the previous dose was administered 9 days previously. The former patient (53-year-old woman) developed hepatic and renal failure requiring haemodialysis for one month while the latter patient (60-year-old man) developed fulminant hepatic failure and died.

Up to December 1995, the Centre for Adverse Reactions Monitoring (CARM) had received 74 reports of hepatic reactions associated with halothane, of which 50 were severe. Ten fatalities were probably or possibly causally associated with the use of halothane.

Halothane hepatitis appears to be associated with metabolites of halothane, but several factors suggest that the mechanism is not a direct hepatotoxicity. Firstly, the interval from anaesthesia to onset of jaundice is typically around 7 days. Secondly, the development of hepatitis is often associated with pyrexia, rash, arthralgia and immune sensitisation. Thirdly, in at least 80% of the cases reviewed, halothane had been administered previously.

Other more recently available inhalation anaesthetics, enflurane, isoflurane, desflurane and sevoflurane are metabolised to a lesser degree than halothane. Nevertheless, enflurane and isoflurane are associated with hepatic dysfunction, albeit apparently at lower rates than halothane. There is limited clinical experience with desflurane and sevoflurane. CARM has 4 reports of hepatic reaction associated with isoflurane (1 patient had also received halothane) and 1 with enflurane, and the WHO database holds 225 and 159 reports, respectively.

Key words: Anaesthetics; Halothane; Hepatitis; Liver.

Reprints: Ministry of Health, PO Box 5013, Wellington, New Zealand.
FLUORIDE-INDUCED NEPHROTOXICITY
FACT OR FICTION [German]
M Nuscheler, P Conzen, D Schwender and K Peter
Munich, Germany
Abstract from Anaesthesist 45 (Supplement 1) S32-S40 1996

In the 1960s, the widespread use of the inhalational anaesthetic methoxyflurane was associated with a significant occurrence of postoperative renal dysfunction. This was attributed to hepatic biotransformation of methoxyflurane and subsequent release of inorganic fluoride ions into the circulation. Based upon the clinical experience with methoxyflurane, serum fluoride concentrations exceeding 50 μmol/L were considered to be nephrotoxic. Without further re-evaluation, this 50 μmol/L threshold was subsequently applied to other fluorinated anaesthetics as well. Enflurane and even isoflurane may, when used during prolonged operations, also yield inorganic fluoride levels in excess of 50 μmol/L. Nevertheless, no cases of renal dysfunction attributable to prolonged use of these anaesthetics have been reported. About 4% of the new inhalational anaesthetic sevoflurane is metabolized, and fluoride concentrations exceeding those after enflurane are frequently measured. Numerous studies have examined the nephrotoxic potential of sevoflurane degradation products. However, fluoride-related toxicity has been observed neither in animal nor in clinical studies, including prolonged administration and patients with pre-existing renal disease. New insights into the intrarenal metabolism of volatile anaesthetics may well explain the absence of nephrotoxicity after sevoflurane. The threshold for fluoride nephrotoxicity of 50 μmol/L, still given in many medical textbooks, can no longer be applied as an indicator of nephrotoxicity after isoflurane, enflurane or sevoflurane. Therefore, the elevated serum fluoride concentrations consistently recorded following anaesthesia with sevoflurane are devoid of clinical significance.

Key words: Anaesthetics; Enflurane, Inorganic fluoride; Isoflurane; Methoxyflurane; Nephrotoxicity; Sevoflurane.
Reprints: M Nuscheler, University of Munich, Marchioninistrasse 15, D-81377 Munich, Germany.

Fluoride 30 (1) 1997