Supplementary Submission No 97a

INQUIRY INTO DENTAL SERVICES IN NSW

Organisation: Australian Fluoridation Information Network

Name: Ms Ailsa Boyden

Position: Spokesperson

Telephone:

Date Received: 29/08/2005

Theme:

Summary

Committee Social Issues - Jul 29 05_Addendum to Submission No. 97 to Inquiry into Dental Services in NSW regarding water fluoridation.

From: "Ailsa Boyden"
To: "The Director Standing Committee on Social Issues" <socialissues@parliament.nsw.gov.au>
Date: 29/08/2005 1:24:35 am
Subject: Jul 29 05_Addendum to Submission No. 97 to Inquiry into Dental Services in NSW regarding water fluoridation.

The Director
Standing Committee on Social Issues
Legislative Council
Parliament House
Sydney 2000
9230 3078
socialissues@parliament.nsw.gov.au

Dear Director,

Re: Addendum to Submission No. 97 to the Inquiry into Dental Services in NSW regarding water fluoridation.

Since forwarding my Submission, three important points have come to my attention:

1. Evidence of a positive link between fluoride in tap water and the often-fatal bone cancer osteosarcoma; (**1**)
2. Dental fluorosis has increased overall in the United States by 9% (to 32%) over twenty years; (**2**)
3. A new study published by a team of Chinese scientists reports that elevated consumption of fluoride during childhood can cause kidney damage. (**3**)

In the light of the positive link between fluoride in tap water and osteosarcoma, the science-based US Environmental Working Group (http://ewg.org/) has petitioned the US National Toxicology Program (NTP) seeking to put fluoride into an expedited review for inclusion in its authorative Report on Carcinogens (RoC), based on fluoride-in-tap-water's ability to cause osteosarcoma in young males under 20 years of age. (The RoC only lists substances that are known carcinogens or "reasonably anticipated to be human carcinogens".)

JAIMA (The official Journal of the *Australasian Integrative Medicine Association*) (Volume No. 25 ~ July 2005, pages 33 to 37) carried the story "*The fluoride issue - the problems are mounting*". (**4**) This article was based on the EWG's petition to the NTP.

Eleven US Environmental Protection Agency employee unions representing over 7000 environmental and public health professionals of the US Civil Service have called for a moratorium on drinking water fluoridation programs across the United States. (**5**) These unions have asked EPA management to recognize fluoride as posing a serious risk of causing cancer in people. The unions acted following revelations of an apparent cover-up of evidence from the Harvard School of Dental Medicine linking fluoridation with an elevated risk of a fatal bone cancer in young boys. The suspected cover-up was by Professor Chester W. Douglass (Chair of the Department of Oral Health Policy and Epidemiology at the Harvard School of Dental Medicine who also works for Colgate as

Editor-in-Chief of the Colgate Oral Care Report). Douglass is now under investigation by Harvard and the National Institute of Environmental Health Sciences. (**6**)

I trust the Dental Inquiry committee will view the above issues seriously.

Yours truly,

Ailsa Boyden
Spokesperson
Australian Fluoridation Information Network

References:

(**1**) See attachment: "*Letter nominating F in tap water as a carcinogen*"
(**2**) See attachment: "*0024_Fluorosis on the rise according to new US survey*"
(**3**) See attachment: "*0025_Fluoride & Kidney Damage in Children*"
(**4**) See attachment: "*0289_AIMA presentation and JAIMA publication*"
(**5**) See attachment: "*EPA Unions Call for Nationwide Moratorium on Fluoridation, Congressional Hearing on Adverse Effects, Youth Cancer Cover Up*"
(**6**) See attachment: "*Professor at Harvard is being investigated*"

Government Asked to Evaluate the Cancer-Causing Potential Of Fluoride in Tap Water

News Release

EWG letter to NTP

View Fluoride Stories By State

Download This Petition

Excerpt: Harvard Doctoral Thesis

FAST FACTS

The first U.S. city to fluoridate its water was Grand Rapids, Michigan, in 1945.

Fluoride is now in the water supply of 170 million Americans.

Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Italy, Luxembourg, Netherlands, Norway, and Sweden have decided against fluoridating their citizens' water. Find out why at the Fluoride Action Network.

Fluoride Toothpaste sold in the U.S. carries a warning: "Keep out of reach of children under 6 years of age. If more than used for brushing is accidentally swallowed get medical help or contact a Poison Control Center right away."

The U.S. EPA considers 4 parts per million a safe amount of fluoride in drinking water; the National Academy of Sciences, Food and Nutrition Board concluded that a safe level for infants under 6 months of age is 0.7 parts per million. The World Health Organization sets its standard at 1.5 parts per million.

June 6, 2005

Dr. C. W. Jameson
National Toxicology Program, Report on Carcinogens
P.O. Box 12233
79 Alexander Drive
Bldg. 4401 Room 3118
MD-EC-14
Research Triangle Park, NC 27709

Dear Dr. Jameson:

We are writing to nominate fluoride in tap water for inclusion in the Report on Carcinogens based on its ability to cause osteosarcoma in males less than 20 years of age.

The science supporting the link between fluoride and bone cancer in boys is compelling, and much of this science is recent and not reflected in current drinking water contaminant limits or the overall risk-benefit equation underlying the decision to add fluoride to the tap water of 170 million people. This widespread exposure to fluoride in tap water ensures that millions of boys are exposed during critical periods of development and growth that are relevant to the cancer in question.

EWG is aware of the value of fluoride to dentistry, yet a substantial and growing body of peer-reviewed science strongly suggests that adding fluoride to tap water may not be the safest way to achieve the dental health benefits of fluoridation. Based on a number of serious health concerns with fluoride, in 2002, the EPA commissioned a general review of the toxicity of fluoride by the National Research Council (NRC) of the National Academy of Sciences (NAS). Although the NRC panel will consider cancer effects in its comprehensive review, the committee is not charged with making a basic determination of fluoride's ability to cause bone cancer in boys. The NRC panel is comprised of individuals from a wide range of disciplines including dentistry, reproductive toxicology, neuroscience, biophysics, and epidemiology. Consequently it does not have the depth of expertise in carcinogenicity, the resources, or the mandate that the National Toxicology Program can bring to bear on this specific question. Only the NTP is in a position to undertake a thorough review of the total weight of the evidence supporting fluoride carcinogenicity — from the mechanistic data, through genotoxicity, animal cancer bioassays, and human epidemiologic studies.

Summary of the science

The overall weight of the evidence strongly supports the conclusion that exposure to fluoride in tap water during the mid-childhood growth spurt between ages 5 and 10 increases the incidence of osteosarcoma in boys ages 10 through 19. Biologically, the link between fluoride in tap water and bone cancer in boys is highly plausible. Fifty percent of ingested fluoride is deposited in bones, and fluoride is a mitogen that stimulates bone growth in the growing ends of the bones where the osteosarcoma occurs. Fluoride is also a confirmed mutagenic agent in humans, which suggests that fluoride can cause genetic damage in bone cells where it is

There are ongoing legislative battles over fluoridating water in Colorado, New Jersey, Oregon, Vermont, Washington, California, Massachusetts and Nebraska. New Hampshire, Virginia, Florida, Arkansas, and Tennessee have also had debates about the additive.

The National Academy of Sciences will release a new report on fluoride safety in February 2006.

actively deposited, in this case precisely where the osteosarcoma arises. Animal studies add further credence to the potential link between fluoride and bone cancer in males. The only two animal cancer bioassays conducted with fluoride both show rare bone tumors, many of which were malignant, in male as opposed to female test animals. And finally, three high quality epidemiology studies each show a strong association between fluoride in tap water and osteosarcoma in boys. While several epidemiology studies have failed to find an association between fluoride and osteosarcoma in boys, these studies typically did not look for a relationship between age of exposure to fluoride and the incidence of bone cancer in young males.

Osteosarcoma accounts for about 3 percent of all childhood cancers. The five-year mortality rate is around 50 percent, and nearly all survivors have limbs amputated, usually legs.

Early concerns about cancer

Concern about the ability of fluoride to cause bone cancer arose first in a 1977 NAS review of fluoride safety, where the academy committee expressed concerns about a high (13.5 percent) incidence in bone structure defects in the population of one of the nation's first fluoridated communities, Newburgh, New York compared to a 7 percent rate in the non-fluoridated Kingston community. At that time, the NAS recommended a full study of fluoride's potential to cause osteosarcoma in young boys. The resulting U.S. Public Health Service (USPHS) study was completed in 1991 and found a significant association between fluoride exposure and bone cancer in boys.

The 1991 USPHS study was based on data collected by the National Cancer Institute from 1973 through 1987. The first phase compared osteosarcoma rates in males under 20 years of age in fluoridated communities, with non-fluoridated communities in Iowa and around Seattle. The researchers found a 79 percent increase in osteosarcoma from 1973 through 1987 in fluoridated communities, compared to a 4 percent decrease over the same time period in non-fluoridated communities. A second phase of the study expanded the analysis nationwide, and found that the rates of osteosarcoma were 57 percent higher in the fluoridated communities than in communities with non-fluoridated water supplies (Hoover 1991).

As a follow-up to the USPHS study, the New Jersey Department of Health (NJDH) commissioned a similar study at the municipal level based on an individual's residence at the time of osteosarcoma diagnosis. The NJDH found that young males living in fluoridated communities had significantly higher rates of osteosarcoma than young males living in non-fluoridated areas; males 10-19 years old in fluoridated areas were 6.9 times more likely to develop osteosarcoma than those in non-fluoridated areas. According to the study authors, the findings "support the importance of investigating the possible link between osteosarcoma and overall ingestion of fluoride" (Cohn 1992).

Some experts questioned the significance of the NTP study findings when it was published citing the lack of an association between

osteosarcoma and the length of time that individuals were exposed to fluoride in tap water. The overall weight of the scientific evidence, however, including a doctoral thesis from Harvard discussed below that closely examined timing of exposure in relationship to osteosarcoma incidence, provides compelling evidence that fluoride exposure during distinct mid-childhood periods of rapid bone growth is a much better indicator of osteosarcoma risk, than total duration, or average lifetime exposure.

Of the studies that have failed to find an association between fluoride in tap water and bone cancer (Operskalski 1987; McGuire 1991; Freni and Gaylor 1992; Moss 1995; Gelberg 1995), most have basic methodological issues that readily explain the negative findings. For instance, four of the five studies referenced above failed to analyze for age-specific effects, making it impossible for them to find such an association. The other (Operskalski) used friends and neighbors as controls, which according to one expert, Dr. Elise Bassin, produced a phenomenon called overmatching, where "detecting a benefit or risk for fluoride would be unlikely" (Bassin 2001, pg 78). Overall, as summarized by Bassin, "Prior studies have primarily evaluated fluoride exposure at the time of diagnosis or as an average lifetime exposure, and have not evaluated exposures at specific ages during growth and development when cell division is occurring rapidly" (Bassin 2001, pg 69).

New Harvard doctoral thesis supports fluoride-bone cancer link

Environmental Working Group (EWG) has attached to this petition, key portions of a doctoral dissertation from the Harvard School of Dental Medicine that found a strong, statistically significant relationship between fluoride in tap water at levels commonly found in American water supplies, and the rare but often fatal form of bone cancer, osteosarcoma, in boys. The association is particularly strong when exposure occurs during periods of rapid bone growth that take place between ages five and ten. The findings confirm the results of earlier studies by the U.S. Public Health Service and the New Jersey Department of Health that found an association between fluoride in tap water and bone cancer in males under age 20.

The dissertation by Elise Bassin is titled "Association between fluoride in drinking water during growth and development and the incidence of osteosarcoma for children and adolescentsÓ. Bassin was awarded a doctorate by the Harvard School of Dental Medicine in 2001. The research findings from her doctoral dissertation, however, have not yet been published.

The study came to the attention of EWG as a result of a failed attempt to obtain the full doctoral thesis by the staff of the National Research Council committee on fluoride safety. After being repeatedly denied a copy of the thesis, the NRC committee instead sent a committee member to the Harvard Countway Library of Medicine to read the entire document and report back to the committee. Environmental Working Group obtained a copy of the results section of the document from the Fluoride Action Network, who sent two researchers to the library, each of whom were allowed to copy 10 percent of the document.

Dr. Bassin's study measured the risk of osteosarcoma before age 20 based on exposures to fluoride in drinking water during each year of age in childhood. The methodology employed is rigorous and fluoride levels in tap water for each study participant were confirmed for each year of exposure during childhood. The analysis shows significantly elevated risks of bone cancer in boys exposed to fluoridated water during a window of vulnerability, from ages five through ten, with a peak risk associated with exposures at seven years of age.

Elevated bone cancer risks were identified by Bassin at fluoride levels that are commonly found in American water supplies. For drinking water systems with fluoride levels from 30 to 99 percent of the amount recommended by the Centers for Disease Control and Prevention (CDC), Bassin reports elevated risks for exposure from ages five through ten, with a five-fold risk of osteosarcoma for those exposed at age seven (4.94 (1.23-19.8) at 95% CI)). At 100 percent or more of the recommended level (and still far below legal maximum levels), the risk for exposure at seven years old rises to 7.2-fold (1.73-30.0) at the 95% CI (Bassin 2001, pg 95 — see results section attached).

The CDC's recommended fluoride levels are well below what is legally allowed in tap water. The EPA's maximum contaminant limit, or MCL, for fluoride in tap water is 4 parts per million. The CDC recommends optimal fluoride levels ranging from 0.7-1.2 parts per million based on average annual air temperatures and corresponding water consumption rates.

Notably, Bassin's doctoral dissertation was based on a reanalysis of data from another study that found no association between drinking water fluoride levels and bone cancer, co-authored by Harvard Department Chair Dr. Chester Douglass (McGuire 1995). In her reanalysis, Bassin examined the same cases and controls used by Douglass in 1995. Dr. Bassin, however, refined the analysis by limiting cases to individuals exposed at less than 20 years old and conducted a more detailed analysis of fluoride exposure and age-specific effects. The result was a very strong correlation between fluoride exposure and bone cancer, particularly for boys exposed at ages 6 through 8.

Fluoride/cancer link in epidemiology studies is strongly supported by additional data

When the results of USPHS, New Jersey, and Harvard (Bassin) studies are combined with the results of animal tests, human genotoxicity studies, and the known biochemistry and metabolism of fluoride, the overall weight of the evidence strongly supports a conclusion that fluoride causes the rare and often fatal bone cancer osteosarcoma in boys. Beyond human epidemiologic studies, the core supporting evidence includes the following:

- The two animal cancer bioassays conducted to date each found an increase in extremely rare bone tumors among male test animals in two species, rats and mice, exposed to fluoride (Maurer 1990; Maurer et al 1993; NTP 1990).
- Six separate studies have found that fluoride causes genetic

mutations in humans (Meng 1995, 1997; Lazutka 1999; Sheth 1994; Wu 1995; Joseph 2000); additional studies show that humans appear to be more sensitive to the genotoxicity of fluoride than rodents (Kishi 1993).

- The link between fluoride and osteosarcoma during periods of rapid growth is biologically highly plausible. Fluoride is a proven mitogen, meaning that it increases the proliferation of osteoblasts (bone formation) during periods of rapid skeletal growth (Gruber 1991; Kleerekoper 1996; Whitford 1996). As put by Dr. Bassin in her doctoral thesis: "It is biologically plausible that fluoride increases the rate of osteosarcoma, and that this effect would be strongest during periods of rapid growth, particularly in males" (Bassin 2001, pg 79).
- Over ninety percent of fluoride in the human body is stored in the bones; 50 percent of fluoride ingested is deposited directly into bones or teeth.

Animal studies found bone cancer in male test animals

Only two long-term animal cancer bioassays with fluoride have ever been conducted; one by the National Toxicology Program (NTP), and another by Procter and Gamble, which involved both rats and mice. Both found an increase in rare bone tumors among male animals exposed to fluoride.

In the NTP study, a dose-dependent increase of osteosarcoma was seen in the bones of fluoride-treated male rats (NTP 1990). These findings are highly significant for a number of reasons:

- Osteosarcoma is extremely difficult to produce in rats; the only other environmental agent known to induce osteosarcoma in rats is high doses of radiation;
- The levels of fluoride in the treated rats' bones were in the same range as fluoride found in human bones;
- Bones are the site of fluoride accumulation, and;
- The osteosarcomas were evident before the end of the study, indicating an age dependent vulnerability similar to that seen in human males.

The study authors were unequivocal about their findings: "The neoplasms were clearly malignant (one metastasized to the lung) and there was complete agreement concerning the diagnoses at both the quality assessment and Pathology Working Group stages of the histopathology review."

Curiously, a 1993 National Research Council (NRC) review appeared to miss the importance of the findings. In characterizing the significance of the findings the NRC stated simply: "The equivocal result of osteosarcoma in male rats was not supported by results in females in the same study" (NRC 1993). This is an extraordinary statement given the

prescient concerns for young males raised 16 years earlier by the NAS (in 1977), and the available epidemiologic data available at that time (Hoover 1991; Cohn 1992). Increased osteosarcoma in males, as identified in the Hoover and Cohn studies, is precisely the result that the 1977 NAS panel was concerned about.

In a 2002 review of fluoride toxicity the World Health Organization offered a more reasoned assessment of the results of the NTP rat study: "Such a (dose-dependent) trend associated with the occurrence of a rare tumour in the tissue in which fluoride is known to accumulate cannot be casually dismissed" (WHO 2002).

An additional animal study was conducted by Procter & Gamble, using both mice and rats. The study found a large, dose-dependent increase in rare bone tumors (osteomas) in fluoride-treated mice (Maurer 1993). The second part of the study, in rats, again found bone tumors and a rare tooth tumor in the treated rats but not the controls (Maurer et al. 1990). Apparently this study was discounted because most of the tumors, although rare, were not yet malignant.

Fluoride causes genetic damage in humans

A compound's ability to cause genetic damage is considered an important indicator of cancer-causing potential. Many studies have investigated and found positive evidence of fluoride's genotoxicity. Notable among these is a 1996 study that reported that sodium fluoride was mutagenic to rat cortical bone, the same tissue in which osteosarcoma forms (Mihashi and Tsutsui 1996).

Since 1994, six of eight published genotoxicity studies have found an increased incidence of genetic damage in humans exposed to fluorides. Three were from exposure to airborne fluorides (Meng 1995, 1997; Lazutka 1999), and three others from exposure to fluoride in drinking water (Sheth 1994; Wu 1995; Joseph 2000). In two of the three drinking water studies (Sheth 1994 and Joseph 2000) exposure levels were well within legal limits for fluoride in tap water in the United States (1.9 - 2.2 parts per million (ppm) and 1.6 - 3.5 ppm respectively). The third was at 4 to 15 ppm. Two?additional studies reported no increase in mutagenic damage or decrease in damage among humans drinking excess fluoride in water (Li 1995; Jackson 1997).

The most commonly observed genetic effect has been increased sister-chromatid exchange (SCE), a measure of how often the ends of DNA strands break off and the pieces switch positions when they reattach themselves (see: Sheth 1994; Meng 1995, Wu 1995; Lazutka 1999; Joseph 2000). Wu, who found an increase of SCE among humans drinking water with 4 - 15 ppm fluoride, described the significance of SCE as follows:

"In recent years, SCE analysis has been considered to be a sensitive method for detecting DNA damage. There is a clear relationship between a substance's ability to induce DNA damage, mutate chromosomes, and cause cancers. The SCE frequency in the human body in peripheral blood lymphocytes is very steady, and does not vary with age or sex. Any increase of the SCE frequency is primarily due to chromosome damage.

Thus using a method to detect SCE for exploring the toxicity and harm caused by fluoride is of great importance" (Wu 1995).

The finding of increased SCE in fluoride-exposed humans has reinforced the possibility — as suggested by numerous in vitro studies — that fluoride is a mutagenic agent.

Human sensitivity

The mutagenicity of fluoride was compared in cells taken from rodents with the mutagenicity of fluoride in cells taken from great apes and humans (Kishi 1993). The conclusion of the study was that the ape and human cells showed greater susceptibility to fluoride's mutagenic effects than the rodent cells. These findings suggest that humans may be more susceptible to fluoride's mutagenic properties, and consequently, more susceptible to a potential carcinogenic effect. They may also explain the findings of mutagenic damage in humans' drinking water with relatively low fluoride concentrations: 1.9 - 2.2 ppm and 1.6 - 3.5 ppm (Sheth 1994; Joseph 2000).

Recommendations

The safety of fluoride in America's tap water is a pressing health concern. More than 170 million people live in cities and towns with fluoridated water, and the weight of the evidence strongly supports the conclusion that millions of boys in these communities are at significantly increased risk of developing bone cancer as a result. EWG urges the National Toxicology Program to put fluoride into an expedited review for inclusion in its Report on Carcinogens.

Sincerely,

Richard Wiles
Sr. Vice President
Environmental Working Group

References

1. Bassin EB. (2001). Association Between Fluoride in Drinking Water During Growth and Development and the Incidence of Ostosarcoma for Children and Adolescents. Doctoral Thesis, Harvard School of Dental Medicine.

2. Centers for Disease Control (CDC). (2001). Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States. MMWR. August 17. 50(RR14); 1-42.

3. Cohn PD. (1992). A Brief Report On The Association Of Drinking Water Fluoridation And The Incidence of Osteosarcoma Among Young Males. New Jersey Department of Health Environ. Health Service: 1- 17.

4. Gelberg KH, et al. (1995). Fluoride Exposure and Childhood Osteosarcoma: A Case-Control Study. Am J Pub Hlth 85: 1678-1683.

5. Gruber HE, Baylink DJ. (1991). The effects of fluoride on bone. Clin

Orthop Relat Res. 267:264-77.

6. Heller KE, et al. (1997). Dental caries and dental fluorosis at varying water fluoride concentrations. Journal of Public Health Dentistry 57(3): 136-143.

7. Hoover RN, et al. (1991). Time trends for bone and joint cancers and osteosarcomas in the Surveillance, Epidemiology and End Results (SEER) Program. National Cancer Institute. In: Review of Fluoride: Benefits and Risks Report of the Ad Hoc Committee on Fluoride of the Committee to Coordinate Environmental Health and Related Programs US Public Health Service. pp F1-F7.

8. Joseph S, Gadhia PK. (2000). Sister chromatid exchange frequency and chromosome aberrations in residents of fluoride endemic regions of South Gujarat. Fluoride 33: 154-158.

9. Kishi K, Ishida T. (1993). Clastogenic activity of sodium fluoride in great ape cells. Mutation Research 301(3): 183-8.

10. Kleerekoper M. 1996. Fluoride and the skeleton. Crit Rev Clin Lab Sci. 33:139-61.

11. Freni SC, Gaylor DW. (1992). International trends in the incidence of bone cancer are not related to drinking water fluoridation. Cancer 70(3): 611-8.

12. Lalumandier JA, et al. (1995). The prevalence and risk factors of fluorosis among patients in a pediatric dental practice. Pediatric Dentistry 17: 1, 19-25.

13. Lazutka JR, et al. (1999). Chromosomal aberrations and sister-chromatid exchanges in Lithuanian populations: effects of occupational and environmental exposures. Mutation Research 445: 225-229.

14. Maurer JK, et al. (1993). Confounded carcinogenicity study of sodium fluoride in CD-1 mice. Regul Toxicol Pharmacol. 1993: 154-168.

15. Maurer JK, et al. (1990). Two-year carcinogenicity study of sodium fluoride in rats. J Nat Cancer Inst. 82(13): 1118-1126.

16. McGuire SM, et al. (1991). Is there a link between fluoridated water and osteosarcoma? Am Dent Assoc. 122: 38-45.

17. McGuire S et al. (1995). Fluoride exposure and osteo-sarcoma [ABSTRACT] J Dent Res 74: 98.

18. Meng Z, Zhang B. (1997). Chromosomal aberrations and micronuclei in lymphocytes of workers at a phosphate fertilizer factory. Mutation Research 393: 283-288. (See paper)

19. Meng Z, et al. (1995). Sister-chromatid exchanges in lymphocytes of workers at a phosphate fertilizer factory. Mutation Research 334(2): 243-6

20. Mihashi M, Tsutsui T. (1996). Clastogenic activity of sodium fluoride to rat vertebral body-derived cells in culture. Mutation Research 368(1):

7-13.

21. Moss ME, Kanarek MS, Anderson HA, Hanrahan LP, Remington PL. (1995). Osteosarcoma, seasonality, and environmental factors in Wisconsin, 1979-1989. Arch Environ Health. 50: 235-241.

22. National Academy of Sciences (NAS). (1977). Drinking Water and Health. National Academy Press, Washington, DC., pp. 388-389.

23. National Research Council. (1993). Health effects of ingested fluoride. Report of the Subcommittee on Health Effects of Ingested Fluoride. National Academy Press, Washington, DC.

24. National Toxicology Program (NTP). (1990). Toxicology and Carcinogenesis Studies of Sodium Fluoride in F344/N Rats and B6C3f1 Mice. Technical report Series No. 393. NIH Publ. No 91-2848. National Institute of Environmental Health Sciences, Research Triangle Park, N.C.

25. Operskalski EA et al. (1987). A case-control study of osteosarcoma in young persons. Am J Epidemiol. 126: 118-26.

26. Sheth FJ, et al. (1994). Sister chromatid exchanges: A study in fluorotic individuals of North Gujurat. Fluoride 27: 215-219.

27. Whitford GM. 1996. The metabolism and toxicity of fluoride. Monogr Oral Sci. 16:1-153.

28. Williams JE, et al. (1990). Community Water Fluoride Levels, Preschool Dietary Patterns, and The Occurrence of Fluoride Enamel Opacities. Journal of Pub Health Dentistry 50: 276-81.

29. Wu DQ, Wu Y. (1995). Micronucleus and Sister Chromatid Exchange Frequency in Endemic Fluorosis. Fluoride 28(3): 125-127.

30. World Health Organization. (2002). Environmental Health Criteria 227: FLUORIDES. World Health Organization, Geneva.

http://www.ewg.org/ is the website for both Environmental Working Group and EWG Action Fund

Headquarters 1436 U St. N.W., Suite 100 | Washington, DC 20009 || Contact Us
California Office 1904 Franklin St. Suite 703 | Oakland, CA 94612 || Contact Us

Committee Social Issues - [Science-watch] #24: Fluorosis on the Rise according to new U.S. Survey

From: Michael Connett <michael@fluoridealert.org>
To: <science-watch@lists.fluoridealert.org>
Date: 26/08/2005 4:35:58 am
Subject: [Science-watch] #24: Fluorosis on the Rise according to new U.S. Survey

FAN Science Watch
August 25, 2005

Issue #24: Fluorosis on the Rise according to new U.S. Survey

By Michael Connett

Today, the CDC released the findings of a new national survey of oral health in the United States. The survey found a 9% higher prevalence of dental fluorosis in American children than was found in a similar survey 20 years ago. In addition, the survey provides further evidence that black Americans suffer from higher rates of fluorosis than whites. See CDC's report at:
http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5403a1.htm

The new survey being referred to is 'The National Health and Nutrition Examination Survey' (NHANES). It was conducted during the years 1999-2002.

The NHANES survey found an overall dental fluorosis rate of 32% among U.S. school children aged 6 to 19 years old. This compares to an incidence of 22.8% reported in the last national survey of fluorosis, conducted by the National Institute of Dental Research (NIDR) in 1986-87.

The NHANES survey also found that black Americans are more affected by fluorosis than whites. According to CDC:

> "No clear explanation exists why fluorosis was more severe among non-Hispanic black children than among non-Hispanic white or Mexican-American children. This observation has been reported elsewhere, and different hypotheses have been proposed, including biologic susceptibility or greater fluoride intake."

In sum, the new survey data released today by CDC confirms that total fluoride exposure among U.S. children A) remains too high, B) may be increasing, and C) needs to be lowered.

Committee Social Issues - [Science-watch] #25: Fluoride & Kidney Damage in Children

From: Michael Connett <mconnett@fluoridealert.org>
To: "science-watch@lists.fluoridealert.org" <science-watch@lists.fluoridealert.org>
Date: 27/08/2005 5:28:36 am
Subject: [Science-watch] #25: Fluoride & Kidney Damage in Children

FAN Science Watch
August 26, 2005

Issue #25: Fluoride & Kidney Damage in Children

By Michael Connett

A new study, published by a team of Chinese scientists, reports that elevated consumption of fluoride during childhood can cause kidney damage. (1) The study follows closely on the heels of another Chinese study finding little to no relationship between fluoride consumption in childhood and tooth decay. (2)

The study on fluoride and kidney damage was conducted by a research team from Tongji Medical College. The team surveyed a group of 210 children, and compared the levels of fluoride in the children's water, urine, and blood, with indicators of kidney damage (urinary NAG and gamma-GT activity).

According to the authors, "an obvious dose-effect relationship" existed between the children's water fluoride exposure (over 2 ppm) and the two markers of kidney damage. In other words, the more fluoride the children consumed, the more likely they were to have kidney damage.

Based on the results of the survey, the authors concluded that: "Over 2.0 mg/L fluoride in drinking water can cause renal damage in children, and the damage degree increases with the dinking water fluoride content."

In contrast to the findings on fluoride/kidney damage, another recent survey of children in China was unable to detect a clear relationship between fluoride ingestion and tooth decay. The survey, led by Dr. Wang Binbin at the Chinese Academy of Sciences, examined tooth decay rates in 830 children and adolescents from 4 Chinese communities with varying levels of fluoride in water (from 1.0 to 3.7 ppm).

When the researchers plotted the incidence of tooth decay by the children's age, no dose-dependent relationship between water fluoride levels and tooth decay could be discerned – in contrast to what would be expected based on American research. In fact, among the older age groups (15 and 18 year olds), tooth decay was generally highest in the high fluoride areas.

The findings of these two studies call into further question the almost exclusive focus on teeth in western fluoride research, not to mention the safety of the U.S. safe drinking water standard for fluoride. At 4 ppm, the US "safety" standard is almost twice as high as the levels estimated to cause childhood kidney disease in China. So how does this study compare with what we see in the U.S.? We don't know yet, since no comparable study has yet been conducted.

References:

(1) Liu JL, Xia T, Yu YY, Sun XZ, Zhu Q, He W, Zhang M, Wang A. (2005). [The dose-effect relationship of water fluoride levels and renal damage in children] Wei Sheng Yan Jiu. 34(3):287-8. See: http://tinyurl.com/7gv3h

(2) Binbin W, Baoshan Z, Hongying W, Yakun P, Yuehua T. (2005). Dental caries in fluorine exposure areas in China. Environ Geochem Health. 27(4):285-8. See: http://tinyurl.com/765m2

Committee Social Issues - AFIN BULLETIN # 289_AIMA presentation and JAIMA publication.

From: "Ailsa Boyden"
To: "Ailsa Boyden"
Date: 18/08/2005 12:47:38 am
Subject: AFIN BULLETIN # 289_AIMA presentation and JAIMA publication.

AUSTRALIAN FLUORIDATION INFORMATION NETWORK

AFIN BULLETIN # 289: AIMA presentation and JAIMA publication.

August 17, 2005

Dear All,

Dr John Ryan's presentation "The Science and Politics of Water Fluoridation"

We may not hear much about Dr John Ryan, but when we do it seems that he has managed to (or is about to) pull a rabbit out of a hat. This time, two rabbits: the first was Dr Ryan's power-point presentation, "*The Science and Politics of Water Fluoridation*" delivered at the Australasian Integrative Medicine Association's (AIMA's) 11th International Holistic Health Conference held on Queensland's Sunshine Coast (August 12-15, 2005). Two hundred and fifty doctors, health professionals and regulators attended. Delegates are affiliated with national general practitioner' and other conservative bodies in Australia. Dr Ryan's presentation was accompanied by a handout of his presentation along with an up-dated copy of the Queensland Open Letter www.fluoridealert.org/queensland-letter.htm opposing fluoridation which represents at least 1,500 Australian doctors, dentists, scientists and others.

The second rabbit

Thanks to the efforts and foresight of Dr Ryan and his wife Jeanie, the latest edition of AIMA'S official journal "*JAIMA*" (Volume No. 25 ~ July 2005, pages 33 to 37) contains a well-written article titled, "*The Fluoride issue - the problems are mounting*". This features the June 6, 2005 letter by Richard Wiles (Senior Vice President of the US Environmental Working Group) to Dr C. W. Jameson of the US National Toxicology Program, Report on Carcinogens. This is the letter in which Richard Wiles urged the National Toxicology Program to put fluoride into an expedited review for inclusion in its authorative Report on Carcinogens, based on fluoride-in-tap-water's ability to cause osteosarcoma in young males under age 20.

Richard Wiles is a former senior staff officer at the National Academy of Sciences' Board on Agriculture, where he directed scientific studies, including two that resulted in landmark reports: Regulating Pesticides in Food; The Delaney Paradox and Alternative Agriculture. Wiles is a leading expert in environmental risks to children, and under his direction, EWG http://www.ewg.org/ has become one of the most respected environmental research organizations in the country.

The EWG has an outstanding track record including being instrumental in winning passage of America's first federal law protecting children from toxic pesticides; finding that the US FDA had suppressed findings about mercury in tuna and using the resulting public outcry to force FDA to strengthen its advisory about unsafe levels of mercury in tuna; as well as producing a home test kit for arsenic in decks and play sets - following which hundreds of consumers turned in their test results, which, when analyzed by EWG, helped convince the US EPA to ban arsenic as a treatment for wood used in backyard structures.

See below for a verbatim copy of "*The fluoride issue - the problems are mounting*" which appeared in JAIMA.

A "well-done" to Jeanie and John Ryan jryan@ecn.net.au would not go astray. The publication of this article in a conservative, mainstream health journal might be a leap towards acceptance in medical circles that fluoride can have adverse effects. With a person such as an Immediate Past President of the Federal AMA on AIMA's advisory board, there is an expectation that news of the fluoride-bone cancer link will have a ripple effect through health-professional circles. Dr Kerryn Phelps is this AMA Past President. She is now an Adjunct Professor at the Schools of Public health & General Practice, Faculty of Medicine, University of Sydney.

Ailsa Boyden

.....

The fluoride issue - the problems are mounting
Richard Wiles, EWG USA
(*Journal of the Australasian Integrative Medicine Association,* Volume No. 25 ~ July 2005, pp 33-37)

The debate over fluoride has been a hot issue here in Australia where local governments and health departments have pushed for mass fluoridation of our water supplies. Many scientists and activists have cautioned against fluoridation for a variety of reasons.

In the US, The National Academy of Sciences will release a new report on fluoride safety in February 2006. Scientist and environmental groups have concerns about fluoridation particularly in relation to its effect as a carcinogen.

Citing a strong body of peer-reviewed evidence, the Environmental Working Group (EWG) based in Washington has recently asked the National Toxicology Program (NTP) of the National Institutes of Health (NIH) to list fluoride in tap water in its authoritative Report on Carcinogens, based on its ability to cause a rare form of childhood bone cancer, osteosarcoma, in boys. The Report on Carcinogens lists only substances that are known or reasonably anticipated to cause cancer in humans.

Richard Wiles, Senior Vice President of the US Environmental Working Group (EWG) is a former senior staff officer at the National Academy of Sciences' Board on Agriculture, where he directed scientific studies, including two that resulted in landmark reports: Regulating Pesticides in Food; The Delaney Paradox and Alternative Agriculture. Wiles is a leading expert in environmental risks to children, and under his direction, EWG has become one of the most respected environmental research organizations in the country. http://www.ewg.org/

Fluoridation in the US

The first U.S. city to fluoridate its water was Grand Rapids, Michigan, in 1945.

- Fluoride is now in the water supply of 170 million Americans.
- Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Italy, Luxembourg, Netherlands, Norway, and Sweden have decided against fluoridating their citizens' water.
- Fluoride Toothpaste sold in the U.S. carries a warning: "Keep out of reach of children under 6 years of age. If more than used for brushing is accidentally swallowed get medical help or contact a Poison Control Center right away."

- The U.S. EPA considers 4 parts per million a safe amount of fluoride in drinking water; the National Academy of Sciences, Food and Nutrition Board concluded that a safe level for infants under 6 months of age is 0.7 parts per million. The World Health Organization sets its standard at 1.5 parts per million.

- There are ongoing legislative battles over fluoridating water in Colorado, New Jersey, Oregon, Vermont, Washington, California, Massachusetts and Nebraska. New Hampshire, Virginia, Florida, Arkansas, and Tennessee have also had debates about the additive.

In his letter to the US National Institute of Health, Wiles puts forward the following case for consideration:
We are writing to nominate fluoride in tap water for inclusion in the Report on Carcinogens based on its ability to cause osteosarcoma in males less than 20 years of age.

The science supporting the link between fluoride and bone cancer in boys is compelling, and much of this science is recent and not reflected in current drinking water contaminant limits or the overall risk-benefit equation underlying the decision to add fluoride to the tap water of 170 million people. This widespread exposure to fluoride in tap water ensures that millions of boys are exposed during critical periods of development and growth that are relevant to the cancer in question.

EWG is aware of the value of fluoride to dentistry, yet a substantial and growing body of peer-reviewed science strongly suggests that adding fluoride to tap water may not be the safest way to achieve the dental health benefits of fluoridation. Based on a number of serious health concerns with fluoride, in 2002, the EPA commissioned a general review of the toxicity of fluoride by the National Research Council (NRC) of the National Academy of Sciences (NAS). Although the NRC panel will consider cancer effects in its comprehensive review, the committee is not charged with making a basic determination of fluoride's ability to cause bone cancer in boys. The NRC panel is comprised of individuals from a wide range of disciplines including dentistry, reproductive toxicology, neuroscience, biophysics, and epidemiology. Consequently it does not have the depth of expertise in carcinogenicity, the resources, or the mandate that the National Toxicology Program can bring to bear on this specific question. Only the NTP is in a position to undertake a thorough review of the total weight of the evidence supporting fluoride carcinogenicity — from the mechanistic data, through genotoxicity, animal cancer bioassays, and human epidemiologic studies.

Summary of the science

The overall weight of the evidence strongly supports the conclusion that exposure to fluoride in tap water during the mid-childhood growth spurt between ages 5 and 10 increases the incidence of osteosarcoma in boys ages 10 through 19. Biologically, the link between fluoride in tap water and bone cancer in boys is highly plausible. Fifty percent of ingested fluoride is deposited in bones, and fluoride is a mitogen that stimulates bone growth in the growing ends of the bones where the osteosarcoma occurs. Fluoride is also a confirmed mutagenic agent in humans, which suggests that fluoride can cause genetic damage in bone cells where it is actively deposited, in this case precisely where the osteosarcoma arises. Animal studies add further credence to the potential link between fluoride and bone cancer in males. The only two animal cancer bioassays conducted with fluoride both show rare bone tumors, many of which were malignant, in male as opposed to female test animals. And finally, three high quality epidemiology studies each show a strong association between fluoride in tap water and osteosarcoma in boys. While several epidemiology studies have failed to find an association between fluoride and osteosarcoma in boys, these studies typically did not look for a relationship between age of exposure to fluoride and the incidence of bone cancer in young males.

Osteosarcoma accounts for about 3 percent of all childhood cancers. The five-year mortality rate is around 50 percent, and nearly all survivors have limbs amputated, usually legs.

Early concerns about cancer

Concern about the ability of fluoride to cause bone cancer arose first in a 1977 NAS review of fluoride safety, where the academy committee expressed concerns about a high (13.5 percent) incidence in bone structure defects in the population of one of the nation's first fluoridated communities, Newburgh, New York compared to a 7 percent rate in the non-fluoridated Kingston community. At that time, the NAS recommended a full study of fluoride's potential to cause osteosarcoma in young boys. The resulting U.S. Public Health Service (USPHS) study was completed in 1991 and found a significant association between fluoride exposure and bone cancer in boys.

The 1991 USPHS study was based on data collected by the National Cancer Institute from 1973 through 1987. The first phase compared osteosarcoma rates in males under 20 years of age in fluoridated communities, with non-fluoridated communities in Iowa and around Seattle. The researchers found a 79 percent increase in osteosarcoma from 1973 through 1987 in fluoridated communities, compared to a 4 percent decrease over the same time period in non-fluoridated communities. A second phase of the study expanded the analysis nationwide, and found that the rates of osteosarcoma were
57 percent higher in the fluoridated communities than in communities with non-fluoridated water supplies (Hoover 1991).

As a follow-up to the USPHS study, the New Jersey Department of Health (NJDH) commissioned a similar study at the municipal level based on an individual's residence at the time of osteosarcoma diagnosis. The NJDH found that young males living in fluoridated communities had significantly higher rates of osteosarcoma than young males living in non-fluoridated areas; males 10-19 years old in fluoridated areas were 6.9 times more likely to develop osteosarcoma than those in non-fluoridated areas. According to the study authors, the findings "support the importance of investigating the possible link between osteosarcoma and overall ingestion of fluoride" (Cohn 1992).

Some experts questioned the significance of the NTP study findings when it was published citing the lack of an association between osteosarcoma and the length of time that individuals were exposed to fluoride in tap water. The overall weight of the scientific evidence, however, including a doctoral thesis from Harvard discussed below that closely examined timing of exposure in relationship to osteosarcoma incidence, provides compelling evidence that fluoride exposure during distinct mid-childhood periods of rapid bone growth is a much better indicator of osteosarcoma risk, than total duration, or average lifetime exposure.

Of the studies that have failed to find an association between fluoride in tap water and bone cancer (Operskalski 1987; McGuire 1991; Freni and Gaylor 1992; Moss 1995; Gelberg 1995), most have basic methodological issues that readily explain the negative findings. For instance, four of the five studies referenced above failed to analyze for age-specific effects, making it impossible for them to find such an association. The other (Operskalski) used friends and neighbors as controls, which according to one expert, Dr. Elise Bassin, produced a phenomenon called overmatching, where "detecting a benefit or risk for fluoride would be unlikely" (Bassin 2001, pg 78). Overall, as summarized by Bassin, "Prior studies have primarily evaluated fluoride exposure at the time of diagnosis or as an average lifetime exposure, and have not evaluated exposures at specific ages during growth and development when cell division is occurring rapidly" (Bassin 2001, pg 69).

New Harvard doctoral thesis supports fluoride-bone cancer link

Environmental Working Group (EWG) has attached to this petition, key portions of a doctoral dissertation from the Harvard School of Dental Medicine that found a strong, statistically significant relationship between fluoride in tap water at levels commonly found in American water supplies, and the rare but often fatal form of bone cancer, osteosarcoma, in boys. The association is particularly strong when exposure occurs during periods of rapid bone growth that take place between ages five

and ten. The findings confirm the results of earlier studies by the U.S. Public Health Service and the New Jersey Department of Health that found an association between fluoride in tap water and bone cancer in males under age 20.

The dissertation by Elise Bassin is titled "Association between fluoride in drinking water during growth and development and the incidence of osteosarcoma for children and adolescents ". Bassin was awarded a doctorate by the Harvard School of Dental Medicine in 2001. The research findings from her doctoral dissertation, however, have not yet been published.

The study came to the attention of EWG as a result of a failed attempt to obtain the full doctoral thesis by the staff of the National Research Council committee on fluoride safety. After being repeatedly denied a copy of the thesis, the NRC committee instead sent a committee member to the Harvard Countway Library of Medicine to read the entire document and report back to the committee. Environmental Working Group obtained a copy of the results section of the document from the Fluoride Action Network, who sent two researchers to the library, each of whom were allowed to copy 10 percent of the document.

Dr. Bassin's study measured the risk of osteosarcoma before age 20 based on exposures to fluoride in drinking water during each year of age in childhood. The methodology employed is rigorous and fluoride levels in tap water for each study participant were confirmed for each year of exposure during childhood. The analysis shows significantly elevated risks of bone cancer in boys exposed to fluoridated water during a window of vulnerability, from ages five through ten, with a peak risk associated with exposures at seven years of age.

Elevated bone cancer risks were identified by Bassin at fluoride levels that are commonly found in American water supplies. For drinking water systems with fluoride levels from 30 to 99 percent of the amount recommended by the Centers for Disease Control and Prevention (CDC), Bassin reports elevated risks for exposure from ages five through ten, with a five-fold risk of osteosarcoma for those exposed at age seven (4.94 (1.23-19.8) at 95% CI)). At 100 percent or more of the recommended level (and still far below legal maximum levels), the risk for exposure at seven years old rises to 7.2-fold (1.73-30.0) at the 95% CI (Bassin 2001, pg 95 — see results section attached).

The CDC's recommended fluoride levels are well below what is legally allowed in tap water. The EPA's maximum contaminant limit, or MCL, for fluoride in tap water is 4 parts per million. The CDC recommends optimal fluoride levels ranging from 0.7-1.2 parts per million based on average annual air temperatures and corresponding water consumption rates.

Notably, Bassin's doctoral dissertation was based on a reanalysis of data from another study that found no association between drinking water fluoride levels and bone cancer, co-authored by Harvard Department Chair Dr. Chester Douglass (McGuire 1995). In her reanalysis, Bassin examined the same cases and controls used by Douglass in 1995. Dr. Bassin, however, refined the analysis by limiting cases to individuals exposed at less than 20 years old and conducted a more detailed analysis of fluoride exposure and age-specific effects. The result was a very strong correlation between fluoride exposure and bone cancer, particularly for boys exposed at ages 6 through 8.

Fluoride/cancer link in epidemiology studies is strongly supported by additional data

When the results of USPHS, New Jersey, and Harvard (Bassin) studies are combined with the results of animal tests, human genotoxicity studies, and the known biochemistry and metabolism of fluoride, the overall weight of the evidence strongly supports a conclusion that fluoride causes the rare and often fatal bone cancer osteosarcoma in boys. Beyond human epidemiologic studies, the core supporting evidence includes the following:

- The two animal cancer bioassays conducted to date each found an increase in extremely rare

bone tumors among male test animals in two species, rats and mice, exposed to fluoride (Maurer 1990; Maurer et al 1993; NTP 1990).

- Six separate studies have found that fluoride causes genetic mutations in humans (Meng 1995, 1997; Lazutka 1999; Sheth 1994; Wu 1995; Joseph 2000); additional studies show that humans appear to be more sensitive to the genotoxicity of fluoride than rodents (Kishi 1993).

- The link between fluoride and osteosarcoma during periods of rapid growth is biologically highly plausible. Fluoride is a proven mitogen, meaning that it increases the proliferation of osteoblasts (bone formation) during periods of rapid skeletal growth (Gruber 1991; Kleerekoper 1996; Whitford 1996). As put by Dr. Bassin in her doctoral thesis: "It is biologically plausible that fluoride increases the rate of osteosarcoma, and that this effect would be strongest during periods of rapid growth, particularly in males" (Bassin 2001, pg 79).

- Over ninety percent of fluoride in the human body is stored in the bones; 50 percent of fluoride ingested is deposited directly into bones or teeth.

Animal studies found bone cancer in male test animals

Only two long-term animal cancer bioassays with fluoride have ever been conducted; one by the National Toxicology Program (NTP), and another by Procter and Gamble, which involved both rats and mice. Both found an increase in rare bone tumors among male animals exposed to fluoride.

In the NTP study, a dose-dependent increase of osteosarcoma was seen in the bones of fluoride-treated male rats (NTP 1990). These findings are highly significant for a number of reasons:

- Osteosarcoma is extremely difficult to produce in rats; the only other environmental agent known to induce osteosarcoma in rats is high doses of radiation;

- The levels of fluoride in the treated rats' bones were in the same range as fluoride found in human bones;

- Bones are the site of fluoride accumulation, and;

- The osteosarcomas were evident before the end of the study, indicating an age dependent vulnerability similar to that seen in human males.

The study authors were unequivocal about their findings: "The neoplasms were clearly malignant (one metastasized to the lung) and there was complete agreement concerning the diagnoses at both the quality assessment and Pathology Working Group stages of the histopathology review."

Curiously, a 1993 National Research Council (NRC) review appeared to miss the importance of the findings. In characterizing the significance of the findings the NRC stated simply: "The equivocal result of osteosarcoma in male rats was not supported by results in females in the same study" (NRC 1993). This is an extraordinary statement given the prescient concerns for young males raised 16 years earlier by the NAS (in 1977), and the available epidemiologic data available at that time (Hoover 1991; Cohn 1992). Increased osteosarcoma in males, as identified in the Hoover and Cohn studies, is precisely the result that the 1977 NAS panel was concerned about.

In a 2002 review of fluoride toxicity the World Health Organization offered a more reasoned assessment of the results of the NTP rat study: "Such a (dose-dependent) trend associated with the occurrence of a rare tumour in the tissue in which fluoride is known to accumulate cannot be casually dismissed" (WHO 2002).

An additional animal study was conducted by Procter & Gamble, using both mice and rats. The study found a large, dose-dependent increase in rare bone tumors (osteomas) in fluoride-treated mice (Maurer 1993). The second part of the study, in rats, again found bone tumors and a rare tooth tumor in the treated rats but not the controls (Maurer et al. 1990). Apparently this study was discounted because most of the tumors, although rare, were not yet malignant.

Fluoride causes genetic damage in humans

A compound's ability to cause genetic damage is considered an important indicator of cancer-causing potential. Many studies have investigated and found positive evidence of fluoride's genotoxicity. Notable among these is a 1996 study that reported sodium fluoride was mutagenic to rat cortical bone, the same tissue in which osteosarcoma forms (Mihashi and Tsutsui 1996).

Since 1994, six of eight published genotoxicity studies have found an increased incidence of genetic damage in humans exposed to fluorides. Three were from exposure to airborne fluorides (Meng 1995, 1997; Lazutka 1999), and three others from exposure to fluoride in drinking water (Sheth 1994; Wu 1995; Joseph 2000). In two of the three drinking water studies (Sheth 1994 and Joseph 2000) exposure levels were well within legal limits for fluoride in tap water in the United States (1.9 - 2.2 parts per million (ppm) and 1.6 - 3.5 ppm respectively). The third was at 4 to 15 ppm. Two additional studies reported no increase in mutagenic damage or decrease in damage among humans drinking excess fluoride in water (Li 1995; Jackson 1997).

The most commonly observed genetic effect has been increased sister-chromatid exchange (SCE), a measure of how often the ends of DNA strands break off and the pieces switch positions when they reattach themselves (see: Sheth 1994; Meng 1995, Wu 1995; Lazutka 1999; Joseph 2000). Wu, who found an increase of SCE among humans drinking water with 4 - 15 ppm fluoride, described the significance of SCE as follows:

"In recent years, SCE analysis has been considered to be a sensitive method for detecting DNA damage. There is a clear relationship between a substance's ability to induce DNA damage, mutate chromosomes, and cause cancers. The SCE frequency in the human body in peripheral blood lymphocytes is very steady, and does not vary with age or sex. Any increase of the SCE frequency is primarily due to chromosome damage. Thus using a method to detect SCE for exploring the toxicity and harm caused by fluoride is of great importance" (Wu 1995).

The finding of increased SCE in fluoride-exposed humans has reinforced the possibility — as suggested by numerous in vitro studies — that fluoride is a mutagenic agent.

Human sensitivity

The mutagenicity of fluoride was compared in cells taken from rodents with the mutagenicity of fluoride in cells taken from great apes and humans (Kishi 1993). The conclusion of the study was that the ape and human cells showed greater susceptibility to fluoride's mutagenic effects than the rodent cells. These findings suggest that humans may be more susceptible to fluoride's mutagenic properties, and consequently, more susceptible to a potential carcinogenic effect. They may also explain the findings of mutagenic damage in humans' drinking water with relatively low fluoride concentrations: 1.9 - 2.2 ppm and 1.6 - 3.5 ppm (Sheth 1994; Joseph 2000).

Recommendations

The safety of fluoride in America's tap water is a pressing health concern. More than 170 million people live in cities and towns with fluoridated water, and the weight of the evidence strongly supports the conclusion that millions of boys in these communities are at significantly increased risk of developing bone cancer as a result. EWG urges the National Toxicology Program to put fluoride into an expedited review for inclusion in its Report on Carcinogens.

Sincerely,

Richard Wiles
Sr. Vice President
Environmental Working Group
http://www.ewg.org/

References

1. Bassin EB. (2001). Association Between Fluoride in Drinking Water During Growth and Development and the Incidence of Ostosarcoma for Children and Adolescents. Doctoral Thesis, Harvard School of Dental Medicine.

2. Centers for Disease Control (CDC). (2001). Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States. MMWR. August 17. 50(RR14); 1-42.

3. Cohn PD. (1992). A Brief Report On The Association Of Drinking Water Fluoridation And The Incidence of Osteosarcoma Among Young Males. New Jersey Department of Health Environ. Health Service: 1- 17.

4. Gelberg KH, et al. (1995). Fluoride Exposure and Childhood Osteosarcoma: A Case-Control Study. Am J Pub Hlth 85: 1678-1683.

5. Gruber HE, Baylink DJ. (1991). The effects of fluoride on bone. Clin Orthop Relat Res. 267:264-77.

6. Heller KE, et al. (1997). Dental caries and dental fluorosis at varying water fluoride concentrations. Journal of Public Health Dentistry 57(3): 136-143.

7. Hoover RN, et al. (1991). Time trends for bone and joint cancers and osteosarcomas in the Surveillance, Epidemiology and End Results (SEER) Program. National Cancer Institute. In: Review of Fluoride: Benefits and Risks Report of the Ad Hoc Committee on Fluoride of the Committee to Coordinate Environmental Health and Related Programs US Public Health Service. pp F1-F7.

8. Joseph S, Gadhia PK. (2000). Sister chromatid exchange frequency and chromosome aberrations in residents of fluoride endemic regions of South Gujarat. Fluoride 33: 154-158.

9. Kishi K, Ishida T. (1993). Clastogenic activity of sodium fluoride in great ape cells. Mutation Research 301(3): 183-8.

10. Kleerekoper M. 1996. Fluoride and the skeleton. Crit Rev Clin Lab Sci. 33:139-61.

11. Freni SC, Gaylor DW. (1992). International trends in the incidence of bone cancer are not related to drinking water fluoridation. Cancer 70(3): 611-8.

12. Lalumandier JA, et al. (1995). The prevalence and risk factors of fluorosis among patients in a pediatric dental practice. Pediatric Dentistry 17: 1, 19-25.

13. Lazutka JR, et al. (1999). Chromosomal aberrations and sister-chromatid exchanges in Lithuanian populations: effects of occupational and environmental exposures. Mutation Research 445: 225-229.

14. Maurer JK, et al. (1993). Confounded carcinogenicity study of sodium fluoride in CD-1 mice. Regul Toxicol Pharmacol. 1993: 154-168.

15. Maurer JK, et al. (1990). Two-year carcinogenicity study of sodium fluoride in rats. J Nat Cancer Inst. 82(13): 1118-1126.

16. McGuire SM, et al. (1991). Is there a link between fluoridated water and osteosarcoma? Am Dent Assoc. 122: 38-45.

17. McGuire S et al. (1995). Fluoride exposure and osteo-sarcoma [ABSTRACT] J Dent Res 74: 98.

18. Meng Z, Zhang B. (1997). Chromosomal aberrations and micronuclei in lymphocytes of workers at a phosphate fertilizer factory. Mutation Research 393: 283-288. (See paper)

19. Meng Z, et al. (1995). Sister-chromatid exchanges in lymphocytes of workers at a phosphate fertilizer factory. Mutation Research 334(2): 243-6

20. Mihashi M, Tsutsui T. (1996). Clastogenic activity of sodium fluoride to rat vertebral body-derived cells in culture. Mutation Research 368(1): 7-13.

21. Moss ME, Kanarek MS, Anderson HA, Hanrahan LP, Remington PL. (1995). Osteosarcoma, seasonality, and environmental factors in Wisconsin, 1979-1989. Arch Environ Health. 50: 235-241.

22. National Academy of Sciences (NAS). (1977). Drinking Water and Health. National Academy Press, Washington, DC., pp. 388-389.

23. National Research Council. (1993). Health effects of ingested fluoride. Report of the Subcommittee on Health Effects of Ingested Fluoride. National Academy Press, Washington, DC.

24. National Toxicology Program (NTP). (1990). Toxicology and Carcinogenesis Studies of Sodium Fluoride in F344/N Rats and B6C3f1 Mice. Technical report Series No. 393. NIH Publ. No 91-2848. National Institute of Environmental Health Sciences, Research Triangle Park, N.C.

25. Operskalski EA et al. (1987). A case-control study of osteosarcoma in young persons. Am J Epidemiol. 126: 118-26.

26. Sheth FJ, et al. (1994). Sister chromatid exchanges: A study in fluorotic individuals of North Gujurat. Fluoride 27: 215-219.

27. Whitford GM. 1996. The metabolism and toxicity of fluoride. Monogr Oral Sci. 16:1-153.

28. Williams JE, et al. (1990). Community Water Fluoride Levels, Preschool Dietary Patterns, and The Occurrence of Fluoride Enamel Opacities. Journal of Pub Health Dentistry 50: 276-81.

29. Wu DQ, Wu Y. (1995). Micronucleus and Sister Chromatid Exchange Frequency in Endemic Fluorosis. Fluoride 28(3): 125-127.

30. World Health Organization. (2002). Environmental Health Criteria 227: FLUORIDES. World Health Organization, Geneva.

Dr John Ryan AIMA Member, will be presenting an Abstract titled: "*Science and Politics of Water Fluoridation*" at the upcoming AIMA - 11th International Holistic Health Conference, 12-15 August 2005.

For cancellation of bulletins please notify

Committee Social Issues - Aug 25 05_EPA unions call for nationwide moratorium on fluoridation, Congressional hearing on adverse efefcts, youth cancer cover up.

From: "Ailsa Boyden"
Date: 26/08/2005 9:20:35 am
Subject: Aug 25 05_EPA unions call for nationwide moratorium on fluoridation, Congressional hearing on adverse efefcts, youth cancer cover up.

http://i-newswire.com/pr43887.html
August 25, 2005
EPA Unions Call for Nationwide Moratorium on Fluoridation, Congressional Hearing on Adverse Effects, Youth Cancer Cover Up

Eleven EPA employee unions representing over 7000 environmental and public health professionals of the Civil Service have called for a moratorium on drinking water fluoridation programs across the country, and have asked EPA management to recognize fluoride as posing a serious risk of causing cancer in people. The unions acted following revelations of an apparent cover-up of evidence from Harvard School of Dental Medicine linking fluoridation with elevated risk of a fatal bone cancer in young boys.

The unions sent letters to key Congressional committees asking Congress to legislate a moratorium pending a review of all the science on the risks and benefits of fluoridation. The letters cited the weight of evidence supporting a classification of fluoride as a likely human carcinogen, which includes other epidemiology results similar to those in the Harvard study, animal studies, and biological reasons why fluoride can reasonably be expected to cause the bone cancer – osteosarcoma – seen in young boys and test animals. The unions also pointed out recent work by Richard Maas of the Environmental Quality Institute, University of North Carolina that links increases in lead levels in drinking water systems to use of silicofluoride fluoridating agents with chloramines disinfectant.

The letter to EPA Administrator Stephen Johnson asked him to issue a public warning in the form of an advanced notice of proposed rulemaking setting the health-based drinking water standard for fluoride at zero, as it is for all known or probable human carcinogens, pending a recommendation from a National Academy of Sciences' National Research Council committee. That committee's work is not expected to be done before 2006.
The unions also asked Congress and EPA's enforcement office, or the Department of Justice, to look into reasons why the Harvard study director, Chester Douglass, failed to report the seven-fold increased risk seen in the work he oversaw, and instead wrote to the National Institute of Environmental Health Sciences, the federal agency that funded the Harvard study, saying there was no link between fluoridation and osteosarcoma. Douglass sent the same negative report to the National Research Council committee studying possible changes in EPA's drinking water standards for fluoride.

The unions who signed the letters represent EPA employees from across the nation, including laboratory scientists in Ohio, Oklahoma and Michigan, regulatory support scientists and other workers at EPA headquarters in Washington, D.C. and science and regulatory workers in Boston, New York, Philadelphia, Atlanta, and San Francisco. They are affiliated with the National Treasury Employees Union, the American Federation of Government Employees, Engineers and Scientists of California/International Federation of Professional and Technical Engineers, and the National Association of Government Employee/Service Employees International Union.

The unions' letter is online at http://nteu280.org/Issues/Fluoride/fluoridesummary.htm
For information contact: Dr. William Hirzy, Vice-President, NTEU Chapter 280, Phone(cell) 202-285-0498

More Information
Fluoride Action Network
Published on:
2005-08-25

Committee Social Issues - Jul 13 05_Professor at Harvard is being investigated

From: "Ailsa Boyden"
Date: 27/07/2005 9:37:46 pm
Subject: Jul 13 05_Professor at Harvard is being investigated

http://www.washingtonpost.com/wp-dyn/content/article/2005/07/12/AR2005071201277.html
http://www.washingtonpost.com/wp-dyn/content/article/2005/07/12/AR2005071201277_pf.html
washingtonpost.com
Professor at Harvard Is Being Investigated
Fluoride-Cancer Link May Have Been Hidden By
Juliet Eilperin
Washington Post Staff Writer
Wednesday, July 13, 2005; A03

Federal investigators and Harvard University officials are probing whether a Harvard professor buried research suggesting a link between fluoridated tap water and bone cancer in adolescent boys.

The National Institute of Environmental Health Sciences (NIEHS), which funded Chester Douglass's $1.3 million study, and the university are investigating why the Harvard School of Dental Medicine epidemiologist told federal officials he found no significant correlation between fluoridated water and osteosarcoma, a rare form of bone cancer. Douglass, who serves as editor in chief for the industry-funded Colgate Oral Care Report, supervised research for a 2001 doctoral thesis that concluded boys exposed to fluoridated water at a young age were more likely to get the cancer.

The Environmental Working Group, an advocacy organization, urged federal officials late last month to explore whether Douglass had skewed his 2004 report to the institute to play down possible risks associated with fluoridation.

The practice of fluoridating tap water -- which more than 170 million Americans drink -- has inspired controversy for years, but the majority of federal and state officials back it as a highly effective way to prevent tooth decay. The Centers for Disease Control and Prevention has ranked fluoridation as one of the top 10 health achievements of the 20th century, and numerous studies have shown that fluoridation prevents tooth decay. The National Cancer Institute states on its Web site: "Many studies, in both humans and animals, have shown no association between fluoridated water and risk for cancer."

Douglass reported last year that the odds of having osteosarcoma after drinking fluoridated water was "not statistically different" from the risk after drinking non-fluoridated water. But in 2001, Douglass's doctoral student, Elise Bassin, published a thesis using his data that concluded: "Among males, exposure to fluoride at or above the target level was associated with an increased risk of developing osteosarcoma. The association was most apparent between ages 5-10, with a peak at six to eight years of age."

Bassin's thesis work is considered the most rigorous human study to date on a possible connection between fluoridation and osteosarcoma, a rare but lethal form of cancer that affects males nearly twice as often as females. Patients with the cancer live an average of three years after diagnosis. In

1990, an animal study by the National Toxicology Program found "equivocal evidence" of a link between fluoridated water and cancer in male rats. And more than a decade ago, a New Jersey Department of Health survey found that young males in fluoridated communities had a higher rate of osteosarcoma than those in non-fluoridated communities.

"Fluoride safety is a major public health issue, and a Harvard professor potentially falsifying public research results has huge public health implications," said Richard Wiles, senior vice president of the Environmental Working Group. He added that Douglass's role in editing a newsletter funded by Colgate-Palmolive Co. "creates the appearance of a conflict of interest."

Douglass, who has taught at Harvard since 1978 and has edited the Colgate quarterly since 1997, referred inquires to the university's press office. Harvard Medical School spokesman John Lacey said the school "takes all allegations of misconduct seriously and has a standard system for reviewing allegations of research impropriety. The school is assembling an inquiry committee to review the questions raised concerning the reporting of this work."

Douglass has not edited for the newsletter articles on the possible connection between fluoridation and cancer and has not testified publicly on the issue, Lacey added.

The institute issued a statement similar to Harvard's, saying the NIEHS "takes allegations of misconduct very seriously" and is reviewing the matter.

Bassin could not be reached.

Some public health experts, including Richard Clapp, an expert in the environmental causes of cancer at Boston University's School of Public Health, think Bassin's study should prompt additional research. Researchers suspect a possible connection because half of ingested fluoride is deposited in bones, and fluoride stimulates growth in the end of bones, where osteosarcoma occurs. The Environmental Protection Agency has commissioned a National Academy of Sciences study to examine the safety of fluoridation. A report is due next year.

"It's important, and it needs to be followed up," Clapp said of Bassin's work. "There's a legitimate biological rationale for focusing on young boys."