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New evidence on fluoridation

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Since 1990, five major epidemiological studies.. show a higher rate of hip fractures in fluoridated regions..

Abstract: A review of recent scientific literature re pattern of evidence-- hip fractures, skeletal fluorosis, the effect of fluoride on bone structure in bones and osteosarcomas -pointing to the existence of causal mechanisms by which fluori nes. In addition, there is evidence, accepted by some eminent dental researchers and at least o ited States proponent of fluoridation, that there is negligible benefit from ingesting fluoride, an all) benefit from fluoridation comes from the action of fluoride at the surface of the teeth before f ater is swallowed. Public health authorities in Australia and New Zealand have appeared reluctan openly and frankly the implications of this and earlier scientific evidence unfavourable to the c of the fluoridation of drinking water supplies. (*Aust N Z J Public Health 1997; 21: 187-90)*

In recent years, new scientific evidence has which suggests that there are significant risk negligible benefits from ingesting low levels of fluo e outline the evidence that fluoridation of water supplie rmful to bone, while providing negligible benefits when s wed.

In focusing on the new evidence (most e 1989) in just two areas, it is not intended to diminish t importance of earlier evidence for concern about the healt hazards of fluoridation: notably dental fluorosis, allergies a intolerance reactions, and genetic damage. These are reviewe elsewhere.[1-3]

Fluoride damages bones

Since 1990, five major epidemiological studies from three countries-the United States (US), United Kingdom and France--showing a higher rate of hip fractures in fluoridated regions than unfluoridated regions have been reported in leading peer-reviewed journals.[4-8] Although two of these reports were published as letters, the first was a correction to a refereed publication[9] and the second was a supplement to a refereed publication about a prospective study that took account of major individual risk factors.[10]

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In addition, a prospective study from the US shows a higher rate of hip fractures in a region naturally fluoridated with four parts per million (ppm) fluoride in drinking water than in a comparison region with 1 ppm.[11] Although there have been a few studies that have found no difference between fluoridated and unfluoridated regions, they have been either limited to small samples, or the women were not exposed to fluoride during the time of their lives when fluoride would be expected to affect bone most, that is, before menopause. [12]

The main weight of the recent evidence on hip fractures is consistent with earlier evidence from naturally fluoridated areas that low levels of fluoride ingested for several decades can cause the disease of bones and joints known as osteofluorosis or skeletal fluorosis. Evidence of skeletal fluorosis has been reported in at least nine studies from five countries with fluoride concentrations in drinking water of 0.7 to 2.5 ppm. These studies, and the inadequacies of studies that are used to assert that there is no skeletal fluorosis in the US at fluoride concentrations below 4 ppm, have been reviewed elsewhere.[2]

In three to four decade, when people in areas where water is artificially fluoridated have accumulated fluoride in their bones from birth to old age, the increase in rates of hip fractures and skeletal fluorosis will be larger.

Fluoride has been used in high doses (20 to 32 mg a day) for short periods (one to two years) to treat osteoporosis. It is now recognized widely that, while this therapy adds mass to bones is also damages the bone structure and leads to a higher risk of hip fracture. Bone analyses have shown that elderly women who lived for at least a decade in the town of Kuopio, Finland, with 1 ppm fluoride in its water supply, had high levels of fluoride in bone (typically 900 to 2300 ppm. but for women with impaired kidney function, as high as 3890 ppm). [19,20] These levels are as high as have been reported in patients who have undergone fluoride therapy for osteoporosis.[21]

In the US National Cancer Institute's Surveillance, Epidemiology and End Results Program, an increase of 79 per cent was found in the incidence of osteosarcomas in young men living in fluoridated areas of Iowa and Seattle but not in the unfluoridated areas, where the incidence decreased by 4 per cent[22]. In fluoridated regions of the State of New Jersey, the incidence of osteosarcoma was three to seven times higher among males aged 10 to 19 years than in unfluoridated regions.[23] Osteosarcoma is a rare disease and so more evidences is required before any conclusions are drawn. But there is already a strong basis for concern, because the human data are supported by an animal experiment: the US National Toxicology Program has recorded a statistically significant dose-related increase in the incidence of osteosarcoma in male rats ingesting fluoride.[24.28]

Thus, there is a consistent pattern of evidence-- hip fractures skeletal fluorosis the effect of fluoride on bone structure, fluoride levels in bones, and osteosarcomas - pointing to the existence of causal mechanisms by which fluoride damages bones.

Negligible benefit from fluoride ingestion

Recent research on the mechanism of action of fluoride in reducing the prevalence of dental caries (tooth decay) in humans shows that fluoride acts topically (at the surface of the teeth) and that there is negligible benefit in ingesting it.[24-28] This is supported by experiments on laboratory rats: a slow release source of fluoride fixed in the mouth reduced dental caries, but when the mouth was bypassed by placing the source under the skin, there was no detectable reduction.[29] The lack of observed systemic benefit from ingesting fluoridated water at a concentration of 1 ppm is not surprising, since the resulting level of fluoride in the saliva is only around 0.01 PPM.[30]

The evidence that there is negligible systemic benefit from fluoridation is accepted by eminent dental researchers[26-28] and at least one leading US proponent of fluoridation, Professor Brian Burt.[31] "Therefore, proponents must come to grips with a serious ethical question: is it right to put fluoride in *drinking water* and to mislead the community that fluoride must he ingested, when any small benefit is due to the topical action of fluoride on teeth. [32]

Alleged benefit from fluoride

We say any small benefit because the results of recent large-scale studies in at least three countries show that, when similar communities are compared and the traditional DMFT (number of decayed, missing and filled teeth) index of dental caries is use there is no detectable difference in caries prevalence. This has been demonstrated for school children in the major cities of New Zealand, Australia, the US and elsewhere.[33] (When the newer DMFS (number of decayed, missing and filled surfaces) index was used, a 20 per cent reduction was reported for US,[30] but, in absolute terms, this is only a fraction of a cavity per child.)

Of the many studies used by proponents of fluoridation to claim that there are enormous benefits from fluoridation not one is a randomised controlled trial. Those that have been re-examined have been found to have serious design flaws.[38] hardly any of the many small-scale studies by enthusiasts of fluoridation are 'blind' and, in the rare cases when they are, the so-called control was selected from a known high-caries area.[43] Many studies have also failed to take into account that unfluoridated towns tend to be rural, while fluoridated towns tend to be larger cities, and that there are generally more dental caries in rural areas, irrespective of fluoridation status. In general, diet tends to be better in urban areas.

Many other studies have had no controls. Their authors have justified their profluoridation conclusion on the basis of large temporal declines in tooth decay. But it is now known that equally large decline in caries have taken place in unfluoridated areas,[45-48] and that in several cases, this decline commenced before fluoride in any form was used to a significant degree.[47]

However. there is now abundant evidence that topical uses of fluoride, extensively practised its Europe instead of water fluoridation, are effective in controlling tooth decay.[49] We agree that their cautious uses in dentistry are justified and provide an alternative to fluoridation that satisfies ethical concerns However, in the past they have been promoted and practised rather irresponsibly-for example, the provision of highly concentrated fluoride toothpastes and mouth rinses to young children who inevitably ingest much of the fluoride. Too often overlooked is the evidence cleat tooth decay is associated -with inadequate diets, and that dietary control of caries, without the use of fluoride, is possible.[31]

Bias of health authorities

In our view, the evidence indicates that fluoridation entails real health risks and at best very small benefit. Therefore, the fluoridation of water supplies should he terminated forthwith. Yet, both in Australia and New Zealand, health authorities appear to be redoubling their efforts to fluoridate the remaining towns that have so far managed to hold fluoridation at bay.

The 1991 report on fluoridation by the National Health and Medical Research Council was published just as the first papers reporting the link between fluoridation and hip fractures were being published.[52] It acknowledged in its section 6.4 some of the evidence that skeletal fluorosis is a potential health hazard, but created the false impression in its executive summary that there are no health risks. It is the executive summary which is read by decision makers and the media. The report's profluoridation bias was further demonstrated by its failure to cite any of the studies presenting the evidence against fluoridation published in refereed journals.

The 1995 report to the Minister by the New Zealand Public Health Commission demonstrated similar bias by failing even to cite any of the published papers on hip fractures, skeletal

fluorosis or osteosarcomas.[33] However, the 1994 New Zealand Public Health Commission report did include some of these references and did acknowledge that:

> It is possible iliac there is a small increased risk of hip fracture associated with water fluoridation, though the evidence for this is very inconclusive. More research is required to clarify this issue. A large amount of research has failed to provide evidence that exposure to fluoride causes cancer. However, the possibility of a small increased risk of osteosarcoma (a rare type of bone cancer) in young men cannot be ruled out at this stage. Here again, more research is needed. [From the executive summary; there are similar statements on p. 74 and p. 78.[3-4]

But this information, and the references supporting it, was not forwarded officially to the Minister.

One of us (D.E.), while Federal Minister for Health in Australia from 1972 to 1975, could not get frank answers from his own department on the risks and benefits of fluoridation. Another of us (J.C.), while convenor of the New Zealand Fluoridation Promotion Committee, observed at first hand how his then fellow proponents of fluoridation kept from the public and decision makers the evidence that fluoridation is less effective than claimed by proponents and is harmful, and then represented the evidence in a misleading way when it was eventually released. All of us have observed attempts by the medical and dental establishment in profluoridation countries to evade the evidence of concern and to suppress and misrepresent scientists, medical practitioners and dentists who attempt to publish evidence against fluoridation.[53-57]

For these and other reasons, we have no confidence in the impartiality of those institutions of government and the professions that have endorsed fluoridation for decades. Those who have bunt their careers and professional status on fluoridation cannot credibly assess the evidence against it. We have submitted this short paper for publication in the hope that at least some kind of scholarly debate will ensue.

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