



Is the Ingestion of Fluoride an Immunosuppressive Practice?

This paper records several observations which suggest that habitual ingestion of small doses of fluoride, even as small as the 1 mg/L contained in fluoridated water, may decrease the function of the immune system.

Introduction

In 1987, Moolenburgh (1) stated: 'I am absolutely convinced that fluoride is an immune suppressive substance.' He came to that conclusion following double-blind clinical tests which showed that there were many adverse reactions resulting from drinking fluoridated water.

In 1987, Sutton (2) advanced the hypothesis that, as a result of the normal resorption of bone containing a high concentration of fluoride (which forms in those who habitually drink fluoridated water) (3), the released fluoride could pass through the Haversian canals into the marrow and damage, even destroy, some of the developing cells of the immune system.

There is laboratory evidence that fluoride can affect the efficacy of the cells of the immune system in several ways: for instance, Gibson (4) reported in the High Court, Edinburgh, in 1981, that a 6h exposure of white cells to 0.1 ppm fluoride reduced their unrestricted migration rate by 21% (and 0.5 ppm fluoride reduced it by 74%).

In 1983, Wilkinson (5) acknowledged that: 'If the claim presented in court was correct, then fluoride in water would present a hazard to health as those drinking the water would be at risk from bacterial infections.' He studied the effect of NaF on the locomotion and chemotaxis of human neutrophils and monocytes, using a microphore filter assay and a time-lapse photographic assay, and found that there was total inhibition of neutrophil locomotion when the cells were exposed to NaF at 10⁻² M. The dose-response curve of monocytes was similar to that of neutrophils. At concentrations greater than 10⁻⁴ M, NaF inhibited locomotion of both types of cell, but this was not seen if lower concentrations of NaF were used. He stated that: 'Therefore, these experiments give no reason to believe that fluoride at levels used in drinking water supplies, or at levels likely to be found in the body fluids of individuals drinking fluoridated water, has any deleterious effect on the locomotor properties of the leucocytes involved in defense against infectious disease.' That statement does not take into account the release of fluoride during the resorption of high-fluoride bone developed as a result of habitually drinking fluoridated water (1 mg/L). This practice greatly enhances the annual rate of increase of the fluoride concentration in 'total' bone from approximately 5 ppm to 26 ppm in women, and from 3 ppm to 18 ppm in men (3), resulting in a considerable accumulation of fluoride in their bones.

Alhava et al (3), in 1980, found that the mean fluoride concentration in cancellous bone was 2070 ppm in 24 fluoridated women of average age of 69 years who had been drinking fluoridated water for approximately 20 years. However, in 23 women of average age 64 years who lived in a non-fluoridated area, the mean fluoride concentration was only 622 ppm. The mean fluoride concentrations in men were lower – 1360 ppm in the fluoridated area and 447 ppm in the control one, as in the women less than a third of the mean bone fluoride concentration found in the fluoridated area.

That concentration of fluoride in cancellous bone in women (2070) is more than 200 times (and in men more than 150 times) the 'high' concentration of fluoride (NaF greater or equal to 10⁻³ M) which Wilkinson (5) stated: '... inhibited locomotion of both neutrophils and monocytes' in laboratory experiments. Furthermore, Rich and Feist (6) stated that fluoride deposited in bone is located mainly in the walls of the canaliculi and of the lacunae containing the osteocytes. Therefore, the fluoride concentration in those places is likely to be much higher than that found (3) in total cortical bone (2070 ppm in females and 1360 ppm in men).

It is not known what concentration of fluoride is attained in the canaliculi and lacunae when this high-fluoride bone surrounding them is resorbed and its fluoride content released into the small volume of fluid containing them. However, in cattle, it is sufficiently high to inactivate or kill osteocytes (7).

It is postulated that, as a result of the resorption of this high-fluoride bone, the fluid in the canaliculi will contain a high concentration of fluoride, some of which will stream into the marrow, producing a prolonged exposure of some developing immune system cells to concentrations of fluoride which would considerably exceed the level and exposure time (NaF 10⁻³ M for 30 min) which Wilkinson (5) found caused inhibition of the locomotor action of neutrophils and monocytes in vitro. In addition, Gabler et al (8) observed the effect of F (0.0 – 5.0 mmol/L) pre-treatment on the kinetics of O₂- generation by human neutrophils, and stated: "F inhibits the activation and activity of neutrophils.'

Allman et al (9) found that if 'fluoridated water (NaF at 1 ppm)' was fed to rats for 6 weeks, their 3', 5' cyclic AMP levels in the six tissues tested were increased significantly – in liver, tibia and heart by more than 100%. They stated: 'It is clear that low levels of NaF are able to cause an elevation of tissue cAMP.'

Curnette et al (10) found that '20 mM F is a potent stimulus for O₂- production by neutrophils' and that it 'abolishes phagocytosis.'

Conclusions

The above-mentioned observations suggest that fluoride released in high concentrations during the normal resorption of high-fluoride bone, formed as a result of the habitual ingestion of fluoridated drinking-water for a period of years, may damage some immune system cells and reduce the efficacy of others. Following on the recent string of about 40 in vitro studies which have found that fluoride is a mutagen even when in low concentrations (e.g. 11, 12, 13), this prospect raises further doubts about the safety of compelling whole populations to ingest daily, for the whole of their lives, uncontrollable and cumulative doses of fluoride through their drinking water.

This evidence that the ingestion of fluoride may damage the cells of the immune system certainly raises the question whether HIV+ patients should be permitted to drink fluoridated water

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