

Fluoride and Cancer

Origin of the misconception

Fluoride is routinely added to drinking water in many countries. As a consequence, there are many theories about the health effects of fluoride. There are countless websites linking fluoride to cancer, fractures, heart disease, birth defects and anaemia, to name a few.

Many of these theories propose that fluoride interferes with the normal biology or genetics of the body and causes disease. It is often suggested that fluoride is linked to the development of osteosarcoma (a rare form of bone cancer).

Fluoride

Fluoride (F) is the 13th most abundant element on earth. In people, fluoride is an important part of calcified tissue (bone and teeth). Water fluoridation has been shown to reduce the levels of tooth decay among children.¹

In Australia, the proportion of people who have access to fluoridated water varies between States and Territories, from 76% in Queensland to 93% in New South Wales.² In some areas, fluoride occurs naturally in drinking water, whereas in others it is added artificially. In Western Australia fluoridation of drinking water is controlled by the *Fluoridation of Public Water Supplies Act 1966 (WA)*.³

The National Health and Medical Research Council (NHMRC) produces the Australian Drinking Water Guidelines⁴ to ensure the safety of drinking water, and these were updated in October 2017. The Guidelines specify a target for fluoridation concentration of between 0.7 and 1.0 mg/L, with the lower concentration applying in hot climates where more water is consumed on average. The Guidelines indicate that the concentration of fluoride in drinking water should not exceed 1.5 mg/L.

Current evidence

Over the past 30 years, expert agencies around the world have reviewed the available evidence on water fluoridation and whether it is linked to an increased risk of cancer. These agencies include the International Agency for Research on Cancer (IARC)(1987)⁵, the US Public Health Service (1991)⁶, the Medical Research Council (2002)⁷, the European Scientific Committee on Health and Environmental Risks (SCHER)(2011)⁸, California's Identification Committee (CIC)⁹ and Royal Society of New Zealand (2014)¹⁰. The consensus has been either that there is not enough quality evidence to draw a conclusion one way or the other, or the evidence does not show a link between water fluoridation and any type of cancer.

More recently in Australia, the NHMRC published an Information Paper in July 2017.² following an extensive review of the evidence. The evaluation found that water fluoridation helps to reduce tooth decay in children and adults, and there is no reliable evidence that water fluoridation at current Australian levels causes any health problems. Although there is a link between water fluoridation and dental fluorosis (white spots on the teeth), cases in Australia tend to be very mild or mild, do not affect the function of teeth and is not of aesthetic concern to those who have it.

The NHMRC found reliable evidence that water fluoridation at current Australian levels is not associated with cancer, Down syndrome, cognitive dysfunction, lowered intelligence or hip fracture. Likewise, there is no reliable evidence of an association between water fluoridation and other health conditions such as kidney disease, high blood pressure, low birth weight, musculoskeletal pain, osteoporosis and skeletal fluorosis.

There has also been a research focus on community water fluoridation and the risk specifically of osteosarcoma. In 2006, a US case-control study found an association between fluoride exposure in drinking water during childhood and the incidence of osteosarcoma among boys but not girls.¹¹ Earlier studies had not found any such link. More doubt was cast on the issue when, in 2011, a study detected no association

between bone fluoride levels and osteosarcoma risk.¹² Further, a 2016 study in Texas found no relationship between fluoride levels in public drinking water and childhood or adolescent osteosarcoma.¹³

Summary

Fluoridation is considered by many to be a major public health achievement of the 20th century. The addition of fluoride to drinking water has led to a significant reduction in dental caries. There is no consistent evidence that fluoride in drinking water increases the risk of cancer. The weight of the current evidence supports the view that there is no link between water fluoridation and osteosarcoma.

References

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