Patients will have heard many different stories about water fluoridation – some true, some false. These stories may leave patients frightened, alarmed and possibly confused. A quick glance at some of the anti-fluoridation websites (e.g., http://www.fluoridefreewater.ie/ or http://www.fluoridealert.org/) will show that water fluoridation can be attributed to everything from early mortality to low IQ rates, to Ireland being a docile nation.

As dental professionals, we must have a clear message that we can present to patients to address any concerns that they might have regarding water fluoridation. We should also endeavour to supply patients with the most up-to-date information available.

Background

Water fluoridation is one of the most researched topics in science. The topic has been heavily researched by the Center for Disease Control and Prevention of the United States Public Health Service (CDC), the American Dental Association and the World Health Organisation. In a comprehensive study referred to as the ‘York Report’ in 2000, McDonagh et al. concluded that there is no association between water fluoridation and mortality or any other adverse effects on general health. McDonagh et al. concluded that the only negative effect of water fluoridation is fluorosis. They also commented that the prevalence of fluorosis is overestimated, because other enamel opacities not caused by fluoride were being included in reports. The report indicates that poor quality studies have given insufficient evidence on the possible negative effects of water fluoridation, leading to a high risk of bias. McDonagh stated that water fluoridation reduces the prevalence of dental caries and reduces the inequalities in dental health across social classes. Furthermore, this study concluded that water fluoridation should continue and should be promoted unless evidence indicates otherwise.

The Irish situation

In 2000 the Minister for Health and Children, Micheál Martin TD, launched the Forum on Fluoridation. This was established in order to independently review the fluoridation of public piped water supplies and make recommendations to the Minister. Following its final report in 2002, the Forum on Fluoridation recommended that the Expert Body on Fluorides and Health be established to oversee the implementation of the recommendations. The Expert Body consists of a wide variety of members from different professions. The New and Emerging Issues Sub-Committee of the Expert Body monitors issues on fluoride and health, and related matters. The Expert Body is charged with informing the Minister for Health on ongoing research into fluoride. The Expert Body produced a Code of Practice on the Fluoridation of Drinking Water to ensure quality assurance in the delivery of water fluoridation. The Code of Practice sets standards for water fluoridation and governs all quality systems and practices including storage, dosage and safety. The key objective of this Code of Practice is high-quality fluoridated water supplies that enhance the oral health of the public who receive fluoridated drinking water.

The topic of water fluoridation can raise questions about civil liberties. It highlights questions in the field of public health ethics that are concerned with balancing individual liberties and the advancement of positive health outcomes. There is a broader responsibility to secure a sufficient level of health for all, thus narrowing societal-based inequalities.
Research into oral health promotion strategies (such as the Ottawa Charter) indicates that government interventions can have a profound beneficial impact on oral health. It is evident from much investigation into the area of oral health promotion that great divides in society can create a gap in equitable dental treatment for all. Water fluoridation is an equitable strategy for combating caries. The main advantage of water fluoridation is that it is available to everyone regardless of their socio-economic background.

Patients may have various questions that they want to ask you about fluoride. Here are a few suggestions as to how you can respond to their concerns:

**Is fluoride safe?**
Fluoride is perfectly safe. The water fluoride levels and quality are tested on a regular basis, when the fluoride is imported and on site. Water fluoridation is monitored by the Expert Body on Fluorides and Health.

At the water treatment plants, various tests are carried out and recorded, which are in turn forwarded to the local authorities on a monthly basis. These are also forwarded to a designated person, such as a Principal Environmental Health Officer or Principal Dental Surgeon, or both.

Water fluoridation continues to be endorsed by a comprehensive collection of international bodies including the World Health Organisation, the CDC, the United States Surgeon General, the Federation Dentaire Internationale/World Dental Federation and the International Association for Dental Research.

The CDC has stated that: “Water fluoridation is one of the 10 greatest health achievements of the 20th century”.

**Where does the fluoride added to our water come from?**
The fluoride in our water comes from hydrofluorosilicic acid, which is derived from fluorspar. It is produced in Spain by a company called Derivados Del Fluor, S.A. Contrary to some beliefs, it is a primary product and not a waste product.

**Is fluoride safe for my child?**
Fluoride is safe for children. The use of fluoridated toothpaste is suggested after the age of two years. However, infants should be supervised while brushing so that they do not ingest the toothpaste.

A recent study conducted by the HSE, ‘Topical Fluorides’, suggests that children in non-fluoridated areas over the age of seven years should have access to weekly fluoride mouthrinses with 0.2% sodium fluoride. They do not recommend using these rinses in younger children because of the increased risk of the child swallowing the rinse.

**How does fluoride work?**
Fluoride works by slowing down the demineralisation process or the pace at which minerals are removed from enamel, and it can also reverse decay in its early stages. In developing teeth, it can also reduce the depth of pits and fissures. A low level of fluoride is beneficial for preventing dental caries. If fluoride is present at an acid attack it diffuses into the enamel and acts at the crystal surface to reduce mineral loss. Fluoride can then combine with minerals that have been dissolved (calcium and phosphate) to grow fluorapatite-like crystalline material within the tooth, which is more resistant to further acid attacks.

**How much fluoride is in Irish drinking water?**
At one stage the fluoride content in Irish drinking water was one part per million (ppm); however, to combat fluorosis, in 2007 the amount was reduced to between 0.6 and 0.8ppm. This level of fluoride in the water supply is deemed optimal for protecting oral health. In water treatment plants, colorimetric testing is carried out at the same time each day; this tests the concentration of fluoride in the water to ensure accuracy.

**What is fluorosis?**
Dental fluorosis is an opacity that affects the first few microns of the enamel layer (Figures 1-3). It is superficial and can be polished away in your dental practice. I would recommend using visual aids here if possible to explain treatment options to patients. Fluorosis has been monitored regularly in Ireland in periodic dental surveys, most recently in the North South Survey of Children’s Oral Health.

**Why do we need fluoride in the water when we use toothpaste as well?**
The Forum on Fluoridation, alongside the WHO, has stated that optimal results are achieved when the two are used in conjunction with one another. The HSE study ‘Topical Fluorides’ investigated all aspects of fluoride use and intake, including water fluoridation, fluoride toothpaste, mouth rinses, etc. It advocated the use of fluoride toothpastes, rinses and varnishes in both fluoridated and non-fluoridated areas.
Why is fluoride in the water supply?

At this time, water fluoridation is the most equitable vehicle for supplying fluoride to the population. Also, the oral health behaviours of Irish children compare unfavourably with that in other countries. A total of 45% of Irish five-year-olds brush twice a day, compared to 76% in the UK. Fewer than 60% of children aged eight or 15 brush twice a day, compared to 75% or more in the UK. In an international comparison of health behaviour in school-aged children in 35 countries (HBSC survey), Ireland ranked in the bottom half of all participating countries for the percentage of children brushing more than once a day (‘Topical Fluorides’).

These are merely a sample of the questions that may be asked. Certain queries may be more elaborate, but the message must remain clear: there is overwhelming evidence that water fluoridation is of great benefit to dental health and of no harm to your general health. The introduction of water charges is sure to provoke interesting debate surrounding water fluoridation.

References


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