



Research Article

ISSN : 0975-7384
CODEN(USA) : JCPRC5

Fluoride concentrations of bottled drinking water in Chennai, India

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ABSTRACT

Knowledge of the fluoride content of the drinking water is essential to all oral care professionals to plan of preventive dental programs and prescribes of fluoride supplements. Evidence of fluoride content in bottled water in Chennai, India is largely anecdotal. Hence the fluoride (F) concentration of commercially available packaged drinking water in Chennai, India was determined. The mean F content of the samples was 0.13 mg/L with a range of 0.08 to 0.21 mg/L.

Keywords: Bottled water; Chennai, India; Fluoride in bottled water.

INTRODUCTION

One of the most recent trends among consumers in various parts of India, including Chennai, is the replacement of their daily water intake with bottled water, possibly due to contaminants in natural and municipal water supplies, avoidance of chemicals such as chlorine used in water treatment, a taste, and the perception that bottled water is healthier. Fluoride is the major component in water which prevent dental caries. The dental caries reduction that derived from drinking fluoridated water is well documented¹. If bottled water is their prime choice, its level of fluoride could have a significant effect on the oral health of the individual. If the level of fluoride in bottled water is too low, optimal caries prevention may not be achieved whilst if levels are too high, developing teeth may be at risk of enamel fluorosis.

Manufacturers are encouraged to list the nutritional contents of their product but the fluoride concentration of the products are not available in some countries and even when appears on the bottle labels, they are not always accurate. Several studies shows that most of the commercially available bottled water failed to list the fluoride content [1, 2].

Knowledge of the fluoride content of the drinking water is essential to all oral care professionals to plan of preventive dental programs and prescribes of fluoride supplements. Evidence of fluoride content in bottled water in Chennai, India is largely anecdotal. Hence this study was designed to estimate the fluoride concentration in commercially available bottled drinking water and to determine if significant differences existed among the products.

EXPERIMENTAL SECTION

Sixteen brands of bottled drinking water were obtained from supermarkets in Chennai. All bottles were stored in a dark place and in their original closed plastic containers at room temperature until the estimation of fluoride was made. Thereafter it was subjected to analysis for the estimation of fluoride at the Tamil Nadu Water supply and Drainage Board using the SPADNS colorimetric method.

RESULTS AND DISCUSSION

Table :1. Fluoride content of bottled water available in Chennai, India

Brand	Estimated fluoride content mg F/l	Fluoride content on the label (mg/l)
Aquafina	0.08	NL*
Aqua fast	0.14	NL*
Aqua best	0.09	NL*
Aqua max	0.1	NL*
Aqua first	0.12	NL*
Aqua speed	0.15	NL*
Aqua feel	0.2	NL*
Anesun aqua	0.17	NL*
ANE Aqua	0.15	NL*
Bisleri	0.09	NL*
Diet aqua	0.11	NL*
Nice Aqua	0.13	NL*
Kinley	0.11	NL*
Tata water plus	0.1	NL*
Holy aqua	0.21	NL*
Seven hills	0.14	NL*

NL*- Not Labelled

Table 1 shows the fluoride ion concentrations in bottled drinking water products sold in Chennai. It was found that fluoride content below 1 mg/L, ranging from 0.08 to 0.21 mg/L which is below the accepted standard for optimally fluoridated water. In Agra City, India the bottled waters had F content below 1 mg/L, ranging from 0.45 to 0.86 mg/L [3].

The concentration of fluoride in the bottled drinking water from Riyadh was found to vary between 0.50 and 0.83 mg/L whereas in Iran it ranged from 0.039 to 0.628 mg/L.[4, 5].

A Study done in North-East of England, UK and Bushehr, Iran showed F content of the samples ranging between of 0.00 to 0.37 mg/L which was also lower than the accepted limits for fluoride content of drinking water[6, 7].

In the present study, none of the tested samples displayed the fluoride content of the water on their labels. Ahiropoulos analysed the water products in Greece (Mean F content 0.35mg/L) and found that only 18% displayed the content of fluoride [1], and in Toumba 's study, 58% of the bottled waters stated the fluoride concentration on the label.[1,8]. In Australia, the fluoride concentration of all bottled waters was less than 0.08ppm. Only three of the 10 brands indicated the fluoride content on their labels [9].

Weinberger measured the concentration of fluoride and compared to that reported on the label of each product and the results showed great variation in fluoride concentration ranging from very low to over 4 ppm. Due to the high content of fluoride, some of these waters are unacceptable for infants. Conversely, some products contain insignificant amounts of fluoride which may deprive the child of the optimal daily fluoride requirement[10]. However, in view of increasing awareness of toxic effects of elevated F intake, particularly in children, it is important that the F level of bottled drinking water be monitored closely to prevent adverse reactions to F from that source.

It is recommended that water companies should display their fluoride content on their labels. This will inform consumers and oral health care providers of the levels of fluoride in bottled water and allow an informed decision regarding consumption of fluoridated drinking water.

Acknowledgment

The authors are grateful to the Chief water analyst, Tamil Nadu Water supply and Drainage Board (TWAD), Government of Tamil Nadu, Chennai.

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