

Original Article

ESTIMATION OF FLUORIDE CONTENT IN THE TAP WATER OF CANADA(ONTARIO) AND INDIA(PUNJAB)

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Abstract

Background: Community water fluoridation is the more cost effective than other forms of fluoride treatment and it gives small amount of fluoride to children and adults over time which prevents cavities and improves oral health. According to US Department of Health And Human Services the optimum level of fluoride should be 0.7 milligrams per liter. **Material and Method-** Tap water from different major cities of both the countries including Canada and India has collected to estimate the fluoride content in them. **Result:** Tap water of different cities of India state Punjab has unsatisfactory content of fluoride. All samples of India have less than optimum level of fluoride content whereas on the other side tap water of Canada has much more fluoride content as compared to India but four cities of Ontario state of Canada named Brampton, Hamilton, Mississauga, Toronto has less fluoride content as compared to optimum content of fluoride which is 0.7 milligrams per liter. Only Waterloo city of Ontario state of Canada has optimum level of fluoride which is 0.7 milligram per liter. **Conclusion:** water fluoridation plays a very important role in the prevention of dental caries. There should be optimum of 0.7 mg per liter of water. If optimum content of fluoride less than 0.7mg then it causes dental caries.

Key Words- fluoride content. Tap water Canada. India. Dental caries

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INTRODUCTION

Fluoride is the thirteen abundant element of earth crust. Presence of fluoride in the public water supply reduces the tooth decay. Fluoride plays very important role as it prevents the enamel of teeth from dissolving under acidic condition. Fluoride is added to public water at concentration of part per million (1ppm) or 1 milligram per liter. Fluoride bind to the tooth enamel which is made up of hydroxylapatite, a crystal which is made of calcium, phosphorous, hydrogen, oxygen. By replacing the hydroxyl molecule on Hydroxylapatite. Fluoride make tooth more resistant to acid attack from bacteria. This is how it prevents the caries. It also reduces the dental fluorosis. Sources of fluoride include fluoride toothpastes, fluoride supplements, fluoride mouthwashes, fluoridated water supplies. Chief source of fluoride is Community water and topical agents like toothpaste. Community water containing fluoride is the best way which provides

inexpensive way to the people who cannot afford dental insurance. Annual cost of Fluoride mouth rinses is much more than community fluoridated water. According to Centers for disease control and prevention panels of experts from different health and scientific fields have provided strong evidence that water fluoridation is safe and effective. The optimal level of fluoride in public water system should be 0.7 milligram per liter of water to 1.2 milligrams per liter of water.

MATERIAL AND METHOD

A comparative study was conducted in the Ontario state of Canada's tap water. In this study water samples collected from different main cities of Ontario. Toronto, Brampton, Mississauga, Hamilton, Waterloo. Tap water sample of one litre were collected in different



hard plastic bottles. Similarly samples of different tap waters were collected from Punjab state of India. Chandigarh, Mohali, Amritsar, Ropar, Kharar. Similarly tap the cities of Punjab include water sample of one litre collected different hard plastic bottles.

i.e in All the water samples were given to the water testing laboratory for the proper determination of fluoride content.

RESULTS

Table 1: DIETARY FLUORIDE SUPPLEMENT SCHEDULE

Dietary Fluoride Supplement Schedule			
Age of Child	Fluoride Level of Drinking Water in PPM		
	< 0.3 PPM	0.3 – 0.6 PPM	> 0.6 PPM
Birth – 6 Months	No Supplements	No Supplements	No Supplements
6 Months – 3 Years	0.25 mg per day	No Supplements	No Supplements
3 – 6 Years	0.50 mg per day	0.25 mg per day	No Supplements
6 – 16 Years	1.0 mg per day	0.50 mg per day	No Supplements

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Table 2: Fluoride concentration in different regions of Canada

SN	Sample Location (Canada)	Fluoride concentration mg/l	TDS Concentration in ppm
1	Sample T-Toronto	0.38	178
2	Sample B- Brampton-Ontario	0.65	173
3	Sample H-Hamilton	0.6	172
4	Sample M- Mississauga	0.36	165
5	Sample W- Water Loo	0.7	336

There are 5 samples collected from different main cities of Ontario Canada. Tap water from Toronto, Hamilton, Mississauga, Waterloo, Brampton is taken and sent to laboratory. The content of fluoride varies in different cities. The fluoride content of Waterloo is 0.7 so there is no need of

additional fluoride supplement as its satisfactory to optimal level of fluoride which ranges from 0.7 to 1.2mg/L. As far as Toronto and Mississauga is concern, age group from 3 to 6 years need

0.25mg/day fluoride supplement and age group from 6 to 16 years need 0.50mg/day fluoride supplement. The fluoride content of Toronto and Mississauga is lesser than optimum level of

Fluoride (0.7 to 1.2mg/L). In Brampton and Hamilton cities no need of additional supplement too as it's satisfactory to optimal level of Fluoride.

TABLE 3: SAMPLE OF TAP WATER FROM INDIA (PUNJAB)

SN	Sample Location (Canada)	Fluoride concentration mg/l	TDS Concentration in ppm
1	Sample –Greater Mohali	0.18	248
2	Sample -Chandigarh	0.09	113
3	Sample Panchkula	0.16	255
4	Sample M- Amritsar	0.24	238
5	Sample Ropar	0.11	119

There are five different samples collected from Punjab state of India. Five main cities of Punjab state of India include Greater Mohali, Chandigarh, Panchkula, Amritsar, Ropar. All five samples of Punjab do not contain optimum content of fluoride so from birth to sixteen years old need fluoride supplements.

Fluoride content of India is unsatisfactory as very low level of fluoride content in the tap water of India. Chandigarh has extremely low fluoride content which is 0.09 mg/l, then comes Ropar which is 0.11mg/l. Amritsar contains 0.24 mg/l fluoride content whereas Greater Mohali has only 0.18mg/l fluoride content. All five samples of INDIA contain extremely low level of optimum content of fluoride i.e 0.7mg/L to 1.2mg/L.

DISCUSSION

Fluoride plays an very important role for infants and children who from age group 6 months to 16 years because during this timeframe primary and permanent teeth comes in the oral cavity. So community water supply containing fluoride plays very important role which prevent them in fighting tooth decay in strengthening their developing teeth. Some people cannot afford high cost of dental visits to get adequate content of fluoride by professional methods like disposable mouth tray of 1.23%APF or 2% sodium fluoride. So community water should contain adequate amount of fluoride

which is beneficial for the development of primary and permanent teeth from 6 months to 16 years. Reports of water samples of India from tap water shows inadequate amount of fluoride content which is the main reason of poor oral health. Inadequate amount of fluoride is the major factor of tooth decay in kids and adults. Due to inadequate content of fluoride children suffer from various kinds of dental problems. Due to caries from inadequate content of fluoride, children, adults suffer from speech problems, movement and inclination of other teeth and their loss of space occur for adult teeth, avoiding certain food because of chewing problems. Due to insufficient fluoride content damages to teeth, patient has to pay more cost from their pocket to dental visits. If Indian government put optimum level of fluoride in their community water supply then people of India will have a better oral health like developed countries and it will save patients out of pocket cost to dental visits. In regards to the reports of water samples of Canada contain more fluoride content as compared to India. Four cities of Ontario Canada Name Brampton, Hamilton, Toronto, Mississauga contain less fluoride content as it should be optimum level of 0.7mg/L. The fluoride content of Waterloo contains satisfactory fluoride content of 0.7mg/L. Due to optimum fluoride content of 0.7mg/L have good oral health The centers for disease control and prevention named fluoridation of drinking

water one of ten great public health achievements of the 20th century noticing that it is a major factor responsible for the decline in dental decay.

CONCLUSION

From the detailed study of report it is concluded that the Tap water of India has very less fluoride content which causes dental caries and main cause of poor oral health. On the other side Tapwater of Canada has more Fluoride content as compared to India but not as optimum level of fluoride which is 0.7mg/L. People of Canada have good oral health as compared to India as survey done by me in the oral hygiene questionnaire study.

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