Effect of Fluoride Content in Consuming Tea by the Local People of Dumraon: A Pilot Study

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ABSTRACT

Fluoride is element, found in drinking water, beverages, vegetables, etc. has the potential to make the body resistant to the different body parts however, an optimal level of this ion is necessary to work its magic. Fluoridation of water is a basic procedure that ensure the presence of precise amount of fluoride content in the drinking water so as to provide systemic and local benefits. The aim of this study was to estimate the fluoride in the tea, consumed by the local inhabitants of New Bhojpur and Purana Bhojpur of Dumraon. It was ensured that the sources of tea was primarily first hand, and tea was not subjected through any filtration process. Each sample was analysed by suitable technique.

Keywords: Tea, New Bhojpur, Purana Bhojpur, Fluoride

Introduction

Fluoride (F) is found to be an important Electronegative Element (anions), found its presence in air, water and soil. In the vegetable food Products, this fluoride also shows their Presence in alarming amounts. For human bodies functional growth, human body requires a limited amount of fluoride, i.e. in the range of 0.5-1.0 ppm, Beyond this level a single dose of 0.25 -0.35gm of fluoride in per kg body weight[1] causes severe biochemical disorder among human body. This fluoride found its way to human body through the various natural sources like Air, Soil, Water, Coffee, Tea and various agricultural product like different types of all Seasonal Fruits and Vegetables. In addition to this we get the fluoride from the fluoridated Tooth Paste along with the fluoridated drinking water. Earlier the various research works shows that the dose of 1mg/L F. in drinking water along with the tropical use of F may prevent the dental caries. But with the advent of chronic use of fluoride at its high level than the permissible has noxious effect in the humans body. By causing various complications like skeletal and non-skeletal deformities, followed with reproductive infertility.

Aim:- The aim of this study was to estimate the fluoride in the tea, consumed by the local inhabitants of New Bhojpur and Purana Bhojpur of Dumraon.

Methods and Material:- To carry out this pilot study, sample consumed tea of local people were collected from the sources near the consumed area from the other random places in Dumaron. A total of 300 samples were collected from the New Bhojpur and Purana Bhojpur of Dumraon. It was ensured that the sources of tea

was primarily first hand, and tea was not subjected through any filtration process. Each sample was analysed by suitable technique.

The people residing in Naya Bhojpur as well as Purana Bhojpur in Dumraon (Buxar) are of low middle income group, Particular the farmer's, etc. Among them a very Vibrant Tendency is found that they are all found addict of consuming tea more frequently in all their different activity they performs throughout the day. The habit of tea consumption among them become a cultural habit with respect to their social status and Income. Tea is found to be a naturally rich source of fluoride [2]. The tea plant (Camellia sinensis) absorb the fluoride (F) from soil through their roots. During "Transpirational pull, this fluoride (F) acculmulates in its leaves. According to an estimated data it's found that this fluoride, content in the tea leaves is ranges between 3.2 mg/kg to 260 mg/kg, with an approximate value from 100 mg/kg to 200 mg/kg, An optimal amount of fluoride (F^-) is found to be about 94.9% of the released Fluoride as consumed by the body from the tea infusions.

The Present Research on the oral health of the fluoride shows the caries Preventive effect of fluoride in the drinking water. It has been also noted that the level of fluoride concentration in the drinking water ranging from 0.2 mg/lt. to 1.5 mg/lt., result's varying degree of skeletal and non-skeletal manifestation followed with dental fluorosis.

According to this mode of observation helps, gave an idea about the amount of fluoride consumed followed with severity of human body toxicity with fluoride. Keeping this observation in mind, an attempt was made in this Research work to determine the change in concentration of fluoride in tea essence prepared from different forms of tea by sampling methods.

Methods and Material

In the Dumraon Market, tea available in the form of:-

1. Tea Bags- Which can be used by dipping it in hot water.
2. Tea Packets- Containing leafy tea.
3. Tea Packets- Containing tea granules of homogenous size.

Now the following methods were employed for the preparation of tea essence like:-

Nearly, 3-4 gm of tea (Either the tea bag or leafy tea granule tea) were added in nearly 100ml of water when it is boiled. Now, after 4-5 minutes of cooling, boiled tea was filters and the solution was recovered in another beaker. The concentration of fluoride in tea essence was recorded. This was done for all varities and bonds of tea sample. Later on the same method were employed, after adding milk and sugar to boiling water.

Method and Methodology useed to Deference Fluoride Concentration in tea essence

The method employed for the estimation of fluoride is done by using fluoride ion selective electrode (Orion- 9609BNWP) coupled with an ion analyser (Orion-4star).

Statistical Analysis

This statistical analysis were done by using statistical package for the Social Sciences, with the version of 11.5 for windows. The comparison was done by ANOVA-technique. The P value equal to or less than 0.05 was found to be significant, equivalent for this purpose.

Results:

The results obtained in fluoride estimation, by using fluoride ion selective electrode (Orion-9609BNWP) coupled to as ion analyser (Orion-

4star) for the fluoride concentration of water, milk and sugar was 0.74mg/l, 0.36mg/l and 0.78mg/l respectively. The result of the study highlighted that the fluoride context in the key was 0.74mg/l, 0.36mg/l and 0.78mg/l respectively.

Discussion :

The availability of fluoride ion for consumption is found it's viability to human body is limited not only from the drinking water, but also from the other sources like- Diet, Milk, Fruits, Vegetables, Tea, Coffee, etc. This reflect the idea that the beneficial effect of fluoride will depend upon the total consumption from all the sources takes together. From this study, it's found that people of New Bhojpur and Purana Bhojpur, invariable consuming, the tea on an average of about 120-180 ml of tea/day. Since New Bhojpur and Purana Bhojpur, consists of middle and low middle class population, they become addict by consuming tea along with breakfast and snacks, so to exposing them for more fluoride along with fluoride present in water. There is a symptomic chance of developing dental fluorosis along with skeletal and non-skeletal manifestation. It was concluded from the study that fluoride in tea can be an additional dietary sources of fluoride which can causes various complication among the people who consumed tea with respect to those who do not consume tea. When 300 (Three Hundred) people of New Bhojpur and Purana Bhojpur, where randomly selected on the basis of those who consumed tea as a part of habit and who do not consume tea on the basis of statistical analysis the data represented as follows-

Total Individual- selected 300

Out of 300, Total Individual- who consumed tea=200

Out of 300, Total Individual- who do not consumed tea is-100

Dental Fluorosis- [In 200] = 120- 60%

Skeletal Fluorosis- [In 200]= 40- 20%

Non-Skeletal Fluorosis-[In 200]= 40- 20%

Total- [In 200]= 200- 100%

Conclusion:

Consuming tea, has found to be a bottle mark effect in the body of human individuals signifies the importance of various dietary food and vegetables, having high fluoride rich value. The water which we consume, also loaded with fluoride, have more or less clinical effect in the body. The results of this study revealed that in New Bhojpur and Purana Bhojpur, People consuming tea has effective level of fluoride, which has profound effective of body of local people, having addict for consuming tea.

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