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A SURVEY OF FLUORIDE CONTENT IN DRINKING WATER IN CHIANG MAI.

Chamroon Yasmuth, B.S: (san)*
Muni Keoplang, M.D.** Tongrit Kanchanop, B.S. (san)*
Suntorn Yayod, M.D.,*** Pat Suchomnong, M.A.*

Abstract

The fluoride content in the drinking water (wells) in Chiang Mai was studied during the period from March to December, 1969. 252 water samples were collected from shallow wells from different areas of the 4 Amphurs (Saraphi, Hod, Prao and Muang) in Chiang Mai. All tests were performed the same day as collection. The results ranged from 0.05 to 1.0 p.p.m. with an average of 0.48 p.p.m., which is still in the acceptable range. Only one sample, collected from a well near a flouride mining area; showed a flouride content as high as 1.66 p.p.m.

Clinical manifestations of fluorosis have been suspected in Nakorn Chiang Mai Hospital. (1) The origin of the fluoride has been unknown. Geographically the Northern part of Thailand, especially Chiang Mai has fluoride bearing minerals widly distributed in this area. Most of the population in rural areas in Chiang Mai had drunk water from wells. The sources of fluoride might be contamination from foods and drinking water.

It has been suggested that 1.0 - 1.5 p.p.m. of fluoride ingestion does not cause any cosmetic defect other than slight flecking of the enamel. (2) A fluorine content in drinking water of more than 1.5 p.p.m might be a cause of Crippling fluorosis, Asymptomatic Osteosclerosis, and Enamel mottling.

The purpose It was the Purpose of this investigation to survey the fluoride content in drinking water (wells) in Chiang

* Department of Preventive and Social Medicine, Faculty of Medicine Chiang Mai University.

** Department of Medicine, Faculty of Medicine, Chiang Mai University

*** First-Class Health Station, Anphur Pan, Chiang Rai.

Mai from March to December, 1969.

Materials and Method

Water samples were collected from Ban Saraphi, Amphur Saraphi, Ban Gongloy, Amphur Hod, Ban Sansai, Amphur Prao and Amphur Muang in Chiang Mai, Samples were fetched in 1 liter stoppered bottles of neutral glass or clean plastic bags and fluoride estimations were made within 24 hours after collection.

Measure 50 ml of water into a 100 ml volumatric flask and add 2.5 ml of fluoride reagent. Mix and keep at room temperature for one hour. Pour into Nessler tube ; measure density by Aqua tester ; compare with standard color. Read within 5 minutes.

Results

Two hundred and fifty two samples were collected ; 120 samples at Amphur Saraphi ; 122 samples at Amphur Prao ; 5 sapmles at Amphur Hod ; and 5 samples at Amphur Muang. It was observed that fluorides were present in all samples. The fluorine content averaged, 0. 16 p.p.m (Saraphi), 0.46 p.p.m. (Prao), 0.66 p.p.m. (Hod) and 0.66 p.p.m (Muang). for the 252 samples values ranged from 0.05 to 1.0 p.p.m. (Presented in table). of those 252 samples pH ranged between 5 - 7. The depth of the wells ranged from 2 to 8 meters, and averaged 5 meters.

Discussion

A survey was made of fluoride content in drinking water in Chiang Mai, from 252 samples colleeted from 4 Amphurs. The fluoride content in drinking water in Chiang Mai is lower than the world Health Standard (1.0-1.5 p.p.m).

In India, Ramamohana Rao N.V. et al examed 302 samples and found That 77.2 percentage ranged from 0.-1.5 p.p.m. and 22.8 percentage were over 1.5 p.p.m. The highest was 6.0 p.p.m. Most of the water came from rocky strata which was rich in fluoride. In Chiang Mai water came from the water table ; The wells were shallow wells.

Comparison of dental health of children in Amphur Ban Honge, Lampoon and children in Amphur Muang, Chiang mai showed 34 %decayed and 70% decayed respectively. The examination of drinking water from Amphur Ban Honge showed 1.6 p.p.m of fluoride content.

Comparison of fluoride content in drinking water from 4 Amphurs did not differ and was rather low. The drinking water does not cause fluorosis, it may be contamination from foods. in India, fluorosis was first reported by Shortt et el., later, the evidence of endemic fluorosis was recorded in various parts of the country. Anand D. et el had also observed that fluorosis exists in endemic form in different parts of the country and found that the cases increased when fluoride content in increased (8 p.p.m.), The cases

decreased when fluoride content decreased. (1.5 p.p.m.). The Fluorine content varies with the seasons. Boiling and filtering can remove some fluoride.

It has been suggested that developing teeth on exposure to fluorenated water become resistant to dental decay. In Chiang Mai fluorine content averaged 0.48 p.p.m. rather low, and the incidences of dental decay were high.

Incidence of fluoride in drinking water in Chiang Mai during March December 1969.

Item	Amphur	Samples	Average of fluoride content (p.p.m.)	Range of Fluoride content (p.p.m.)
1	Saraphi	120	0.16	0.05 – 0.40
2	Prao	122	0.46	0.10 – 1.00
3	Hod	5	0.66	0.60 – 0.80
4	Muang	5	0.66	0.60 – 0.70

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