A-20: Incidence of dental fluorosis in the Handapanagala area and its correlation to the fluoride levels in drinking water

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Flouride plays a key role in the prevention and control of dental caries. However, in excessive amounts fluoride causes mottling of enamel or dental fluorosis. The incidence of dental fluorosis in the North-western provience of Sri Lanka is well documented and correlated to the high fluoride content in drinking water. There is no reported data on either the prevalence of fluoride or dental fluorosis from the Handapanagala area of the Southern province. This study reports the relatively high fluoride levels in isolated locations of Handapanagala and the visual observation of dental fluorosis among the villagers inhabiting this area.

In this preliminary study, water samples were taken randomly at 3 different depths from 22 wells used by the villagers where dental fluorosis was a common occurrence. The wells selected for this investigation were found to spread over a 2 sq mile region covering nearly 50% of the wells found. The subjects were also interviewed and their teeth visually observed for assessing the problem. The water samples were collected in plastic bottles which were previously cleaned in chromic acid. The fluoride content of the water samples were determined by the use of an Orion pH/mV meter. The calcium content of the camples was determined from atomic absorption spectrometry. The total conductivity was also determined using a conductivity meter.

It was found that 15 samples out of a total of 22 samples analysed contained fluoride in excess of the WHO recommended value of 1 ppm. There were 2 samples having fluoride concentraitons as high as 5 ppm. The calcium content of these well water samples which gives a measure of the extent of the mineralization did not exhibit a direct correlation with the fluoride concentration. The calcium concentration ranged from 1-15 ppm while a few exceptional cases had calcium concentrations as high as 140 ppm. There is a linear relationship between the conductance and the calcium ion concentration of the samples.

The high fluoride content of well water has a direct correlation to the prevalence of dental fluorosis amongst the villagers in the Handapanagala area. Visual observation of mottling and brown stains of teeth can be easily correlated to the high concentration of fluoride in drinking water. It is also interesting to note that the fluoride distribution shows distinct localization. Thus the fluoride contents of 2 wells situated opposite each other on either side of the road sometimes show widely different fluoride levels. Such variations in fluoride levels are also manifested in the extent of dental fluorosis amongst villagers using such water for drinking purposes.