Vitamin D Level in Slum Children of Delhi

Sharma and Virmani(1) have looked at *X*-ray and blood biochemistry (serum calcium, phosphorus and Alkaline phos-phatase levels) in 100 infants and children with clinical rickets in Delhi and found that 35% children had low calcium and 35.5% children had raised alkaline phosphatase. However, to diagnose vitamin D deficiency with rickets, it is best that vitamin D metabolites are measured. 25 Hydroxy-cholecalciferol (25 (OH) D) is the most reliable measure of an individual's vitamin D status(2). We have recently conducted a study looking at the 25 (OH) D levels in slum children from three areas in Delhi and found evidence of widespread vitamin D deficiency. This study was funded by Department of Science and Technology of the Government of India.

We measured 25 (OH) D levels in blood of 196 children between the age of 9 months to 30 months residing in three different areas of Delhi using ELISA kit of Immune Diagnostik Germany. *Table* shows the number of children sampled in each area and their vitamin D levels. In Rajiv Colony, 82.9 % children were vitamin D deficient with levels below 35nmol/L (mean level 23.76 nmol/L SD 27.03). In Gurgaon 82% children were vitamin D deficient with mean level 19.2 nmol/L (SD 20.2)

A previous study by us has shown that vitamin D levels were related to Ultra Violet B (UVB) light reaching ground level and that UV Light is inversely related to the amount of pollution and smog(2). In temperate regions vitamin D level is increased during summer(3,4). In this study we studied samples taken in February and August in Rajiv Colony to see if there was an improvement in the post summer level of vitamin D. We found vitamin D deficiency in 84% children with mean vitamin D level 17.8 n mol/L (S D 22.4), even in the samples taken in August.

In contrast to the levels in the two other areas, most samples taken from Sundernagari however had normal levels of vitamin D. Only 2% children were vitamin D deficient and the mean vitamin D level was 96.3 nmol/L (SD 25.7). Sundernagari and Rajiv colony are adjoining colonies and have the same amount of pollution and UV light. This suggests that the low levels of vitamin D in Rajiv colony cannot be explained entirely on the basis of

TABLE–*Vitamin D Levels in Slum Children*

Time of sampling	Area studied	Number of children sampled	Mean vitamin D level (SD)	Percentage of children with vitamin D levels below 35 nmol/L
January 2001	Sundernagari	47	96.3 n mol/L (25.7)	2.00%
February 2001	Rajiv Colony	49	23.76 n mol/L (27.03)	82.90%
August 2001	Rajiv Colony	48	17.8 n mol/L (22.4)	84.00%
August 2001	Gurgaon	52	19.2 n mol/L (20.2)	82.00%

pollution. Enquiries with community health service workers in Sundernagari have suggested that the health workers in this area have been involved in a campaign of diet advice, unrelated to the study undertaken by us. Most of the diet fed to children-under-30-months in the area, is vegetarian. Vegetarian diet is poor source of vitamin D(5). The better vitamin D levels seen in children from this area are therefore difficult to explain on the basis of good diet advice either.

Our study shows that vitamin D deficiency is widespread in some parts of Delhi. The findings of our study make us suspect that other facts may be involved and the poor vitamin D levels may not be explained fully on the basis of pollution and poor UV light. The data from Sundernagari is intriguing and further study is called for, to look at the reasons for the better vitamin D levels seen in this area, as it may provide a clue to tackle the problem of vitamin D deficiency in Delhi.

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