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Overestimation of Prevalence of Vitamin A Deficiency among Rural Preschool Children of West Bengal, India

We read with interest the recent communication on the prevalence of Vitamin A deficiency (VAD) among rural preschool children of West Bengal [1], and urge caution in extrapolating the VAD burden because the survey methodology was prone to overestimating the magnitude of deficiency.

Night blindness was also assessed between 12 and 24 months of age: The presence of night blindness cannot be reliably identified among children between the ages of 12 and 24 months. The World Health Organization (WHO) has therefore recommended that the age group of 24-71 mo should only be included for assessment of night blindness amongst children [2].

Conjunctival xerosis (X1A) as an independent indicator of VAD: VAD is only one of the several causes of conjunctival xerosis; thus the reliability of this sign (X1A) for independent assessment of VAD in field conditions is questionable [3,4]. Conjunctival xerosis is clinically expressed as marked dryness or unwettability; the affected area appears roughened, with fine droplets or bubbles on the surface, rather than smooth and glistening. These changes are best detected in oblique illumination and the abnormalities are often overlooked or, in apparent overcompensation, over-diagnosed. Thus, changes in the conjunctival xerosis by themselves are not an accurate basis for estimating prevalence of clinical xerophthalmia [2,3].

Interpreting serum retinol estimates: According to WHO [2], a major disadvantage of using serum retinol concentration as an indicator of vitamin A status is that retinol concentrations are decreased by acute and underlying chronic infections. The authors did not report simultaneous serum C reactive protein levels to detect overt or subclinical infections for an apt interpretation. Serum retinol concentrations are under homeostatic control over a broad range of body stores and may reflect body stores content only when it is very low or very high. Further, the WHO concludes that there is no direct evidence of the serum cut-off value where functional consequences including morbidity and mortality effects, begin to occur [3]. No data has been provided to reassure that the dried blood spot on filter paper did not underestimate the serum retinol levels due to transport conditions.

In view of the declining trend of VAD in several regions of the country, it would have been pertinent to state the year of the survey to put the findings in true perspective. It would also be prudent to caution that these overestimates from the poorest segment of population are not inadvertently extrapolated to the entire state for programmatic purposes.

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REPLY

As the author stated, we have not assessed the night blindness, the early symptom of VAD in 12-24 month children. Only four children (0.1%) had night blindness among 3932 children of 1-2+ years i.e. 12-36 months. However, the four children are in the age group of 24-36

months. Since we divided the pre-school children into two age groups, we analyzed and presented the data accordingly.

Similarly, we have not presented the prevalence of conjunctival xerosis as an independent indicator of VAD, since it is the subjective sign of VAD. Thus, we just presented the prevalence of night blindness and conjunctival xerosis, as these are also the manifestations of VAD. Similarly, we neither mentioned them as sole indicators of VAD nor related them with socioeconomic status in text. Our entire focus in this communication is only on Bitot's spot, an objective sign of VAD and blood vitamin A levels.

The author rightly pointed out that the blood retinol would decrease if the particular children were suffering from acute/chronic infections. In the present study, we have not estimated the C-reactive proteins to indicate acute/chronic infections. However, de pee and Omar reported that populations with a high prevalence of infection are also more likely to suffer from VAD [1]. Even if we estimated the C-reactive proteins and deleted the subjects with high C-reactive proteins, the prevalence of sub-clinical VAD may not differed have lot as NNMB reported the prevalence of fever and acute respiratory infections as 2.7% and 1%, a respectively for the corresponding period [2]. Similarly, the diets of rural pre-school children were grossly deficit in terms of vitamin A, where the median intakes were deficient by 66-81% as against the RDA of 400 µg. The median vitamin A intakes of 84% of pre-school children were not even 50% of their RDA [3].

Serum retinol is the preferred indicator for population level assessment of VAD, and it is the best-established biochemical indicator of vitamin A status [1]. Similarly, estimation of Serum retinol from dried blood spot (DBS) is a validated and established method [4-6].

The DBS methodology has been validated before it was operationalized. We have had external validation of the DBS and the conventional methodologies with Craft

Technologies, Wilson, USA and currently taking part in the external VitalEQ programme of CDC, Atlanta, USA. We don't believe that the methodology underestimates vitamin A value. There are limited studies to cite the subclinical deficiency of vitamin A. Using the conventional method, the subclinical deficiency of vitamin A was reported to be 55% in school children 6-18 years from a middle-income residential school near Hyderabad [6].

This survey was carried out during the year 2003.As, we are asked to submit the manuscript as "Short communication" we condensed the original manuscript to meet the word count.

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