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Prevalence of vitamin A deficiency in primary school children of Taluka Maval, district Pune of India

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KEYWORDS

Primary school children;
Vitamin A deficiency;
Xerophthalmia;
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VAD.

A B S T R A C T

A baseline survey was conducted in 5 villages of Taluka Maval viz. Shivali, Sangawade, Darumbre, Gahunje and Divad for prevalence of vitamin A deficiency in primary school children. Sub-clinical examination for the presence of vitamin A deficiency (Xerophthalmia) was carried out. The survey revealed 46% prevalence of VAD in Maval Taluka, out of which, 4% night blindness, 33% conjunctival xerosis and 9% Bitot spot found. The prevalence of VAD was well above the WHO cut off level. The prevalence of VAD was higher among boys than girls i.e. 21% & 12% respectively.

Introduction

Under-nutrition continues to be one of the major public health problems in the developing countries including India. Young children are considered, as the most vulnerable group to under-nutrition (NNMB, 2002). In recent years, micronutrient malnutrition has been attracting attention of the scientific community as well as policy makers. Micronutrients are essential to ensure proper growth, development and maintenance of health. They also play a critical role in a host of physiological, biochemical and immunological functions of the body. The consequences of

micronutrient malnutrition are wide ranging and include increased risk of childhood mortality, nutritional blindness physical disability mental retardation, lowered physical work capacity etc. leading to lowered productivity at household, community as well as at the National level (NNMB, 2002). Although large scale data on subclinical VAD are not available, yet, it has been estimated that 35.3 million sub clinical vitamin A-deficient preschoolers live in India (West Jr. 2002).

Vitamin A deficiency is a significant public health problem, affecting a large population

all over the country. The deficiency of other vitamins and trace elements are known to affect the health adversely. However, there is paucity of information and large scale studies are yet to be carried out in India to assess their prevalence in terms of magnitude and distribution in different communities. Though the dietary inadequacy, in terms of both quality and quantity is the primary cause, a host of other socio-economic, socio-cultural and environmental factors like poverty, illiteracy, ignorance, faulty food habits, food fads, and even customs contribute significantly to the problem of micronutrient deficiencies (Indian Council of Medical Research, 2004). Inadequate health care delivery, lack of community participation in the preventive programmes and undesirable health seeking behaviour of the community further aggravate the problem of undernutrition (NNMB, 2002). The general objective of the study was to assess the prevalence of VAD and the health index including BMI among primary school children of the village.

Materials and Methods

A baseline survey was conducted in 5 villages of Taluka Maval *viz.* Shivali, Sangawade, Darumbre, Gahunje and Divad for prevalence of vitamin A deficiency in primary school children. The survey was done in the Primary School of the villages, 486 children of age group 6 to 13 years were covered for the survey. Sub-clinical examination for the presence of vitamin A deficiency (Xerophthalmia) was carried out by the trained surveyors.

Result and Discussion

A total of 486 students of age group 6 to 13 years were covered for the survey of prevalence of sub-clinical signs of vitamin

A deficiency. Out of which, 251 were boys and 235 were girls. The children were from 1st to 6th standard. The survey revealed 46% prevalence of VAD in Taluka Maval, out of which, 4% night blindness, 33% conjunctival xerosis and 9% Bitot spot found. The prevalence of VAD was well above the WHO cut off level of 1%, 10% and 0.5% respectively, indicating that VAD was a significant public health problem in the taluka surveyed. The prevalence of VAD was higher among boys than girls (21% & 12% respectively).

In India although, severe forms of vitamin A deficiency (VAD) has declined in the past two decades, yet clinical VAD exists as a public health problem in many pockets (WHO and UNICEF, 1996) and data on serum retinol levels is scant to assess the extent of sub clinical deficiency (Toteja and Singh, 2004). In the present study baseline prevalence of VAD was 46%. No case of corneal scar or keratomalacia was found. Sub clinical vitamin A deficiency was present in primary school children. A study conducted in a slum area of Delhi in late nineties revealed 1.2% prevalence of night blindness among 2-5 year old children (Kapil et al., 1996). Various individual studies from different regions of India have reported sub clinical VAD (serum retinol <20 Kg/dl) ranging from 26-80% among urban preschoolers (NNMB, 2002; Indian Council of Medical Research, 2004; Gopalan et al., 1960). NNMB (2006) micronutrient survey revealed 62% sub clinical VAD among 1-5 year old preschoolers. This data, however, is for rural population (NNMB, 2002).

To combat and prevent VAD, Government of India, in 1970, initiated National Prophylaxis Program against Nutritional Blindness. The program involves supplementation with massive dose of

Table.1 Table showing age group of children

Age (in yrs)	No. of children
6	3
7	7
8	8
9	15
10	8
11	23
12	14
13	19

Fig.1 Graph showing number of children per age group

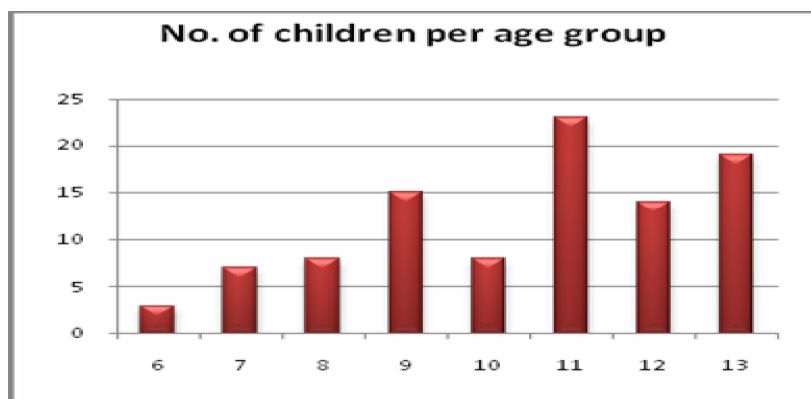


Table.2 Table showing children per class

Class	No. of children
1	7
2	7
3	17
4	12
5	15
6	23

Fig.2 Graph showing children per class

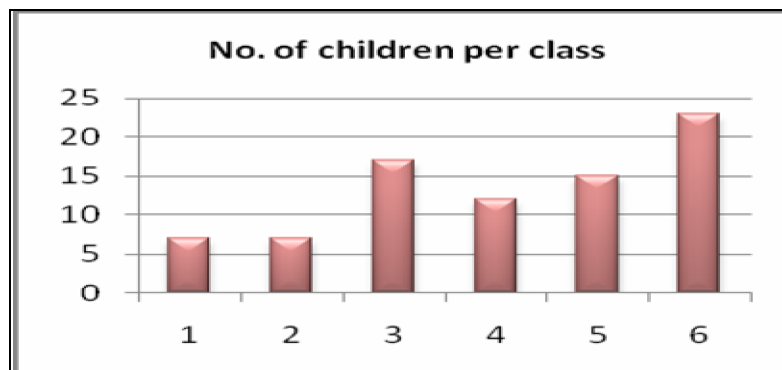


Table.3 Table showing percentage prevalence of VAD in Taluka Maval with respect to WHO cut off level

Clinical Symptom	% Prevalence	WHO cut off level
Night Blindness (XN)	4%	1.00%
Conjunctival Xerosis (X1A)	33%	10.00%
Bitot Spots (X1B)	9%	0.50%
Corneal Xerosis (X2)	Nil	0.01%
Corneal Ulcer (X3A)	Nil	0.01%
Keratomalacia (X3B)	Nil	0.01%
Corneal Scar (XS)	Nil	0.05%

Fig.3 %Prevalence of Vit A deficiency in Primary School Children of Taluka Maval

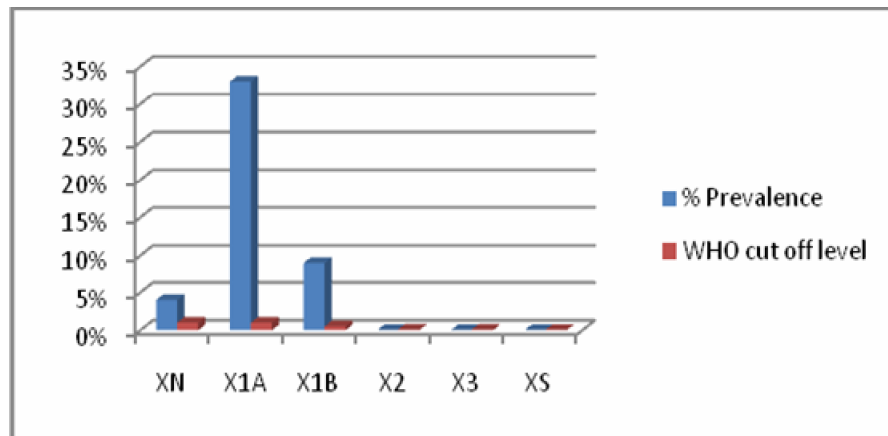


Fig.4 Village girl with Bitot Spot



Fig.5 Village girl with prominent Bitot Spot



vitamin A as a direct strategy and nutrition education as an indirect long term strategy to combat VAD. After more than three decades of operation, the program however suffers from poor compliance ((NNMB, 2002; Toteja and Singh, 2004). Lack of awareness in the community about the program is one of the possible factors for poor compliance.

The intervention model was successful in improving knowledge, attitude and practices. There was an indication of change in prevalence of sub clinical VAD. However, sub-clinical deficiency should be assessed at a larger scale to ascertain impact. Moreover, nutrition education interventions should be strengthened by logistic support.

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