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Original Research Article.

Prevalence of Vitamin A Deficiency and Clinico – Demographic Profile of Primary School Going Children in Rural Area of Moradabad

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ABSTRACT

Introduction: Vitamin A deficiency has long been recognized as a serious and widespread yet preventable nutritional deficiency in the world. Our aim was to estimate the prevalence of Vitamin A deficiency and clinico – demographic profile of primary school going children in rural area of Moradabad.

Materials and Methods: Socio demographic information was collected from the family. Assessment of Vitamin A deficiency was done according to 'WHO' classification. Children were examined for ophthalmic and dermatological signs of Vitamin A deficiency, overall nutritional assessment done with anthropometric and systemic examination and recorded as per preformed proforma.

Results: Total 48 children are suffering from Vitamin A deficiency out of which males were 60.4% and females were 39.6%. Prevalence of Vitamin A deficiency was observed more in male children than females in present study. Vitamin A deficiency was observed more in Socio economically poor status like in Class V (60%) and IV (30%) while not a single child found to have Vitamin A deficiency in Class I and II. The prevalence of night blindness is 0.04%, prevalence of Conjunctival xerosis is 6.5% and of Bitot's spot is about 0.92%.

Conclusion: Children from lower socioeconomic group should be targeted to improve their diet pattern by educating their parents. Similarly co morbidities like worm infestation, Repeated URTI and LRTI and Diarrhea should be effectively treated along with supplementation of Vitamin A.

Keywords: Vitamin A, Conjunctival Xerosis, Bitot's Spot.

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INTRODUCTION

Vitamin A deficiency (VAD) is a public health problem among preschool children in 118 countries of the world. Approximately 127 million children younger than 5 years are estimated to have VAD (serum retinol concentrations below 0.7 mmol.[1] or abnormalities of conjunctival epithelial differentiation) and about 4.4 million of them are estimated to have xerophthalmia.[1] Vitamin A deficiency (VAD) is a major nutritional concern in poor societies, especially in lower income countries. Its presence as a public health problem is assessed by measuring the prevalence of deficiency in a population, represented by specific biochemical and clinical indicators of status.

One of the earliest manifestations of Vitamin A deficiency is night blindness and more severe deficiencies include ocular changes leading to blindness, particularly in young children. Vitamin A deficiency has long been recognized as a serious and widespread yet preventable nutritional deficiency in the world. Vitamin A boosts the immunity1 as it keep the membranes (surfaces) of the mouth, gut, respiratory tract and eye lids wet and healthy. Healthy membranes help to prevent germs entering the body and Vitamin A is needed for antibody production to fight against infection, thus Vitamin A has therapeutic potential as immune modulator. Recent data indicates that mortality rates are increased among children with Vitamin A deficiency and improvement in Vitamin A status can reduce mortality from childhood infections by 20-30%.[2-4]

In addition to the ingestion of VA below the recommended levels, several factors may be associated, aggravating and/or contributing to VAD, such as protein-calorie malnutrition, low serum zinc levels, iron deficiency anemia and infectious stress. These factors frequently lead to the final common pathway of low ingestion of foods rich in VA.[4-7] Deficiency of sufficient duration or severity can lead to disorders that are common in vitamin A deficient populations such as xerophthalmia, the leading cause of preventable childhood blindness, anaemia, and weakened host resistance to infection, which can increase the severity of infectious diseases and risk of death. A poor diet and infection frequently coexist and interact in populations where VAD is widespread. In such settings, VAD can increase the severity of infection which, in turn, can reduce intake and accelerate body

losses of vitamin A to exacerbate deficiency. Most surveys assess its prevalence in young children and, with increasing frequency, in pregnant or lactating women, as reported here. Although VAD is likely to be widespread following the preschool years, few data exist to reveal the extent of VAD in school-age and young adolescent children.[8] The stages of xerophthalmia are regarded both as disorders and clinical indicators of VAD, and thus can be used to estimate an important aspect of morbidity and blinding disability as well as the prevalence of deficiency. As corneal disease is rare, the most commonly assessed stages are night blindness, obtainable by history, and Bitot's spots, observable by handlight examination of the conjunctival surface. Standard procedures exist for assessing xerophthalmia.[9] Although night blindness and Bitot's spots are considered mild stages of eye disease, both represent moderate-to-severe systemic VAD, as evidenced by low serum retinol concentrations,[10] and increased severity of infectious morbidity (i.e. diarrhea and respiratory infections) and mortality in children and pregnant women.[11] Our aim was to estimate the prevalence of Vitamin A deficiency and clinico – demographic profile of primary school going children in rural area.

MATERIALS AND METHODS

The present descriptive study was including Primary schools coming under Health Care Centers of Moradabad district, Uttar Pradesh. Children included in the study are from 5 to 10 yrs of age. Socio demographic information was collected from the family. Research Ethics Committee of the Teerthanker Mahaveer University and Hospital, Assessment of Vitamin A deficiency was done according to 'WHO' classification.[12] Children were examined for ophthalmic and dermatological signs of Vitamin A deficiency, overall nutritional assessment done with anthropometric and systemic examination and recorded as per preformed proforma. Statistical analysis was done with percentages and proportions. Children who had presented at least one episode of axillary temperature 37 degree measured with a thermometer during the preceding 15 days, or children who had evacuated three or more times with the elimination of liquid or semiliquid feces during a period of 24 h or children who had eliminated feces with blood visible by ectoscopy at least once during the 15 days preceding the study were excluded from the investigation. The children underwent ocular inspection by the same physician (VICC) to detect the possible presence of conjunctival and corneal xerosis, Bitot's spots, corneal scars or xerophthalmia at the time of the first blood collection. The height and the weight of fasting children were measured by VICC on the same day of blood collection according to the procedure detailed by other authors.[13]

RESULTS

In our findings; total 48 children are suffering from Vitamin A deficiency out of which males were 60.4% and females were 39.6% details of Age and gender wise distribution of Vitamin A deficient Children were given in table 1.

Prevalence of Vitamin A deficiency was observed more in male children than females in present study. Vitamin A deficiency was observed more in Socio economically poor status like in Class V (60%) and IV (30%) while not a single child found to have Vitamin A deficiency in Class I and II. The prevalence of night blindness is 0.04%, prevalence of Conjunctival xerosis is 6.5% and of Bitot's spot is about 0.92%. Conjunctival xerosis was found more in 5 yrs of age and Bitot's spot was found more in 10 yrs age. Among non-ocular manifestations worm infestations, Dermatological and repeated URTI and LRTI manifestations were more prevalent among primary school going children. Age and gender wise Ocular manifestations in Vitamin A deficient children were given in table 2.

Table 3 shows the Distribution of non - ocular manifestations among Vitamin A deficient children.

Table 1: Age and gender wise distribution of Vitamin A deficient Children.

Age	Male	Female	Total
5 years	11 (22.9)	7 (14.6)	17
6 years	7 (14.6)	5 (10.4)	11
7 years	4 (8.3)	3 (6.25)	6
8 years	4 (8.3)	2 (4.2)	6
9 years	2 (4.2)	1 (2.1)	3
10 years	1 (2.1)	1 (2.1)	2
Total	29 (60.4)	19 (39.6)	48

Table 2: Age and gender wise Ocular manifestations in Vitamin A deficient children

Age Group	Conjunctival xerosis		Bitot's spot	
	Male	Female	Male	Female
5 years	11	7	-	-
6 years	7	5	-	-
7 years	4	3	-	1
8 years	3	2	1	-
9 years	1	1		-
10 years	-	-	2	1

Table 3: Distribution of non - ocular manifestations among Vitamin A deficient children

Clinical manifestation	Male	Female	Total
Worm infestation	4 (8.3)	3 (6.25)	7 (14.6)
Repeated URTI / LRTI	2 (4.2)	1 (2.1)	3 (6.3)
Dermatological	1 (2.1)	2 (4.2)	3 (6.3)
Others	8 (16.7)	6 (12.5)	14 (29.2)

DISCUSSION

Preschool-age children are considered to be populations most at-risk for VAD due to their increased demands for vitamin A and the potential health consequences associated with VAD during these life stages. Earliest signs of vitamin A deficiency are occular. Prevalence ofoccular signs increases with age of the child. Highest incidence is seen in school going children. Several studies have been conducted over the past few years in an attempt to evaluate the prevalence of hypovitaminosis A in the world. The overwhelming majority of reports of this deficiency occur in many developing countries, especially among children and in a subclinical manner.[14-16] In spite of these studies, population data regarding the prevalence of VAD among school-aged children are rare. A pioneering attempt to identify VAD in children in this age range in Southeast Asia suggested that 23.4% of the population aged 5–15 years (83 million)[17] had blood retinol concentrations lower than 0.7 mmol.[1]

Up to the second half of the 1980 decade, VAD was a source of concern only regarding its clinical signs, which range from night blindness to irreversible nutritional blindness. Today, however, cases of xerophthalmia, Bitot's spot and keratomalacia are considered to represent only the tip of the iceberg, with the existence of much larger proportions of populations in less advanced (marginal) stages of deficiency, a fact that may also contribute to morbidity and mortality among children, newborn babies, women of reproductive age, puerperae and nursing mothers, the groups traditionally considered to be at risk. It has been calculated that the total number of children with marginal VAD is 5- to 10-fold higher than the number of children with clinical deficiency.[18,19] The epidemiological observations that relate marginal VAD to collaborate to an increase in the rates of childhood morbidity and mortality have led to the development of increasingly sensitive diagnostic methods and earlier diagnoses. Vitamin A deficiency exists equally in all children, irrespective of grade of malnutrition. To reduce the prevalence of Vitamin A deficiency among school going children all the children should receive Vitamin A prophylaxis as recommended by ICMR.

CONCLUSION

Prevalence of Vitamin A deficiency was observed more in male children than females in present study. Vitamin A deficiency was observed more in Socio economically poor status like in Class V (60%) and IV (30%) while not a single child found to have Vitamin A deficiency in Class I and II. Children from lower socioeconomic group should be targeted to improve their diet pattern by educating their parents. Similarly co morbidities like worm infestation, Repeated URTI and LRTI and Diarrhea should be effectively treated along with supplementation of Vitamin A.

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