

## PREVALENCE OF XEROPHTHALMIA AMONGST UNDER FIVES IN URBAN SLUMS AND RURAL AREAS OF KANPUR

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### Abstract:

Research Question:- What is the prevalence of xerophthalmia & is there any difference in the occurrence in urban slums and rural area

- Objectives:- 1.To assess overall prevalence of xerophthalmia in urban slums and rural area  
2. To identify the association of breast feeding and weaning with the development of xerophthalmia  
3. To identify association of xerophthalmia and immunization status of children.

Study Design:- Cross sectional study

Setting:- The study was performed in five urban slums and two rural areas of Kanpur.

Statistical Analysis:- Chi-square test, Relative risk

Results:- Overall prevalence of xerophthalmia was observed 6.66%, in urban slums it was found to be 7.28% and in rural area 6.08%. Maximum no.(50.60%) of xerophthalmic children belonged to age group 4-5 years. Higher prevalence was observed in children who were not breast fed (45.45%) and not immunized (38.7%).

### Introduction :

Vitamin A deficiency in the words of 'Edward De Mayer' was once considered as the "Cindrela" of diseases. Nutritionist ignored it as a problem of blindness prevention while those involved with blindness prevention ignored it as problem of malnutrition. However, it has currently been recognised as one of the most important micronutrient deficiencies of public health significance leading to irreversible blindness in young children. The most vulnerable group is infants and pre school children.

This is one of the four most important types of malnutrition prevalent in developing countries; the other being protein energy malnutrition, iodine deficiency disorders and iron deficiency anaemias

According to an estimates 30,000 to 40,000 children may loose their eye sight due to Vitamin A deficiency in India every year. In India milder forms affecting conjunctiva like Bitot's spot are observed in about 1-5% of preschool children (1-5 year).

It is now estimated that Vitamin A deficiency, including subclinical and clinical forms of severe and moderate degrees of public health significance, exists in more than 60 countries. Worldwide, an estimated 2.8 million children 0-4 years of age are clinically affected by Vitamin

A deficiency, and 251 million more are severely or moderately subclinically deficient. Thus, at least 254 million preschool children are 'at risk' in terms of their health and survival.

In the view of above, the present study was carried out to find out the prevalence of xerophthalmia amongst under five children in urban slums and rural area of Kanpur and to identify association of xerophthalmia with breast feeding and timing of weaning and immunization status.

**Material & Methods:-** The present study was conducted amongst all the children of under 5 years age group. In order to determine prevalence of Vitamin A deficiency in less than 5 years children a total of about 10,000 population out of which 5000 from rural area, surrounding Kanpur and 5000 from urban slums has been considered for the study.

Unit of study were all children aged under 5 years. Vitamin A deficiency was identified after house to house survey of all house holds in the study population with the help of local health worker in the area.

Informations were recorded in a predesigned and pretested proforma regarding all children under 5 years of age. After taking family into confidence the purpose of study was explained to them. All the bio-social factors were studied. General information like type of the

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area, name, age, sex of child, name of father, religion, type of family, total family numbers, parents' occupation and education, monthly income, type of house, ventilation, presence of overcrowding etc. were noted.

To determine the socio - economic class, modified **B.G. Prasad's** classification (1991) as suggested by **P. Kumar** was used. History of illness in preceding 3 months was also elicited from the parents and special emphasis was given to episodes of diarrhoea, respiratory illness, worm infestation and measles. For diarrhoea and respiratory illness, more emphasis was given if any episode in last 15 days has occurred.

A detailed dietic history was also taken with special reference to consumption of Vitamin A rich foods as green leafy vegetables, yellow fruits, milk etc. Also noted that whether these things were taken regularly or irregularly.

Immunization status of child at the time of survey was enquired, verification were made by checking immunization cards if available. Otherwise mother's statement was taken to be true. Immunization was considered complete, if child has received 3 doses of DPT, OPV, one dose of BCG and measles with an interval of not less than 4 weeks between 2 doses, and partial if either doses were missed or interval between 2 doses being less than 4 weeks. The child was considered not immunized who has not received any of vaccines .

History of breast-feeding and age at which weaning was started also taken.

Vitamin A deficiency was mainly assessed by clinical examination of eye following WHO criteria (1982).

**OBSERVATIONS :**

**TABLE - I**  
**AGE AND SEX WISE DISTRIBUTION OF CHILDREN SUFFERING FROM VITAMIN A DEFICIENCY**

Age group (years)	Urban						Rural						Grand Total	
	Male		Female		Total		Male		Female		Total		No.	%
0 - 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 - 2	1	4	-	-	1	2.27	1	4.55	-	-	1	2.56	2	2.40
2 - 3	3	12	2	10.53	5	11.35	5	22.73	3	11.65	8	20.51	13	15.66
3 - 4	9	36	7	38.04	16	36.36	4	18.18	6	35.24	10	25.64	26	31.34
4 - 5	12	48	10	52.63	22	50.00	12	54.55	8	47.06	20	51.29	42	50.60
Total	25	56.82	19	43.18	44	100.0	22	65.41	17	43.59	39	100.0	83	100.0
Mean	3.78	3.92			3.72 ± 0.97		4.02 ± 0.82							
± S.D.	± 0.83	± 0.68												

Vitamin A deficiency is a public health problem. The maximum no. of children suffering from xerophthalmia were in age group of 4-5 years both in u

rban slums (50.0%) and in rural areas also(51.29%)while no child was seen with any symptomatic of Vitamin A deficiency amongst 0 - 1 year age group.(Table I)

**TABLE-II**  
**SEX WISE OCCURRENCE OF SIGNS AND SYMPTOMS OF XEROPHTHALMIA AMONGST UNDER FIVE CHILDREN (MULTIPLE RESPONSE)**

Ocular signs and Symptoms	Urban slum			Rural area			Grand Total		
	Male (n= 316)	Female (n = 228)	Total (n = 604)	Male (n = 338)	Female (n = 303)	Total (641)	Male (n = 654)	Female (n = 591)	Total (1245)
Nightblindness	6 (1.90)	2 (0.69)	8 (1.32)	3 (0.89)	1 (0.33)	4 (0.62)	9 (1.38)	3 (0.51)	12 (0.96)
Conjunctival xerosis	13 (4.11)	9 (3.13)	22 (3.64)	8 (2.37)	9 (2.97)	17 (2.65)	21 (3.21)	18 (3.05)	29 (2.33)
Bitot's spot	12 (3.79)	9 (3.13)	21 (3.48)	10 (2.96)	12 (3.96)	22 (3.43)	22 (3.36)	21 (3.55)	43 (3.45)
Corneal	2 (0.63)	1 (0.35)	3 (0.51)	-	2 (0.66)	2 (0.31)	2 (0.31)	3 (0.51)	5 (0.41)

Problem of xerophthalmia is occurring amongst both sexes in under 5 children. Occurrence of xerophthalmia was observed equally amongst male and female children

of urban and rural communities (table II) . No case of corneal ulceration or sequaleae was found.

**TABLE-III**  
**DISTRIBUTION OF CHILDREN ACCORDING TO HISTORY OF BREAST FEEDING**

History of Breast feeding	Urban slum			Rural area			Grand Total		
	Total No. (n = 604)	Xerophthalmic children (n = 44)	%	Total No. (n = 641)	Xerophthalmic children (n = 39)	%	Total No. (n = 1245)	Xerophthalmic children (n = 83)	%
Breast fed	425	12	2.82	512	12	2.34	937	24	2.56
Top fed + Breast fed	169	27	15.91	110	22	20.0	279	49	17.56
Not breast fed	10	5	50	12	5	41.66	22	10	45.45

$\chi^2 = 17.23$ , d.f. = 2, H S, p < 0.05  
 $\chi^2 = 11.23$ , d.f. = 2, H S, p < 0.05

Breast milk is the main source of Vitamin A for 6 months of age.

Present study reveals that only 2.56% of children were suffering from xerophthalmia who were dependent

on breast feeding while 45.45% children were suffering from xerophthalmia who were not taking breast feeding. (Table III)

**TABLE-IV**  
**WEANING AGE WISE DISTRIBUTION OF UNDER 5 CHILDREN**

Age of weaning	Urban slum			Rural area			Grand Total		
	Total No.	Xerophthalmic children (n = 44)		Total No.	Xerophthalmic children (n = 39)		Total No.	Xerophthalmic children (n = 83)	
	(n = 604)	No.	%	(n = 641)	No.	%	(n = 1245)	No.	%
≤ 4 mths	153	9	5.88	114	7	6.14	267	16	5.99
> 4 mths	451	35	7.76	527	32	6.12	978	67	6.89

In this study too much variation has not been observed among the children who had weaning below four months or after four months. (Table IV).

**TABLE-V**  
**IMMUNIZATION STATUS OF UNDER 5 CHILDREN IN STUDY AREA**

Immunization status	Urban slum			Rural area			Grand Total		
	Total No.	Xerophthalmic children (n = 44)		Total No.	Xerophthalmic children (n = 39)		Total No.	Xerophthalmic children (n = 83)	
	(n = 604)	No.	%	(n = 641)	No.	%	(n = 1245)	No.	%
Fully immunized	547	14	3.06	360	7	1.94	817	21	2.57
Partially immunized	128	22	17.18	251	21	8.36	379	43	11.35
Not immunized	19	8	42.10	30	11	36.67	49	19	38.78
Relative risk		2.14			4.57				

Table V shows only 2.57% fully immunized children were suffering from vitamin A deficiency in contrast to 38.78% non immunized children.

**Discussions :**

Vitamin A deficiency is one of the most serious public health problems in developing countries, more so in India (Reddy, 1978).

The problem is serious, not only because it leads to various eye signs and symptoms and resultant blindness, but also leads to increased incidence of diarrhoeal and respiratory diseases resulting in high mortality and morbidity in children (Sommer, 1983). Ocular manifestations of hypovitaminosis A are reasonably reliable indicators of Vitamin A status of Indian people as there is poor correlation between ocular signs and symptoms of Vitamin A deficiency and serum levels of Vitamin A (Mclaren, 1966).

A total of 797 households in urban slums and 619 households in rural area were taken for the study. 327 households in urban slums whereas 276 in rural area had children under 5 years of age. Out of 1258 children of under 5 of years, 610 were in urban slums and 648 in rural areas.

The prevalence of Vitamin A deficiency was found to be 7.28% in urban slums where as in rural area it was observed 6.08%. Overall prevalence observed was 6.66%. (Table XI)

Devendra W. Khandit (1996) has reported overall, prevalence of xerophthalmia was 8.7% in under five children.

Very low prevalence rate of 2.6% has been reported by Desai (1977) in a study conducted in Jodhpur. Variation of prevalence rates in different studies signifies the importance of variability of factors i.e. age, sex seasonal

trend, climate, clustering, diet, nutrition, socio-economic status, literacy, health facilities and precipitating conditions like diarrhoea, respiratory infections, exanthems like measles, chicken pox, worm infestations and a host of other infectious disease (Sommer 1984; Mathur, 1987; Sikder, 1988).

In the present study majority of xerophthalmic children (50% in urban slums and 51.29% were from rural area belonging to age group 4-5 years. In the present study, the prevalence of xerophthalmia was significantly higher in 3-5 years age group than children under three years of age. Prevalence of deficiency peaking in this age group is probably due to inadequate Vitamin A intake among these children because of Poverty, ignorance and unavailability of Vitamin A rich food. Moreover, around this age there is maximum incidence of diarrhoeal diseases and worm infestations which impair Vitamin A absorption, increase metabolism and cause PEM. All these factors interfering with storage, transport and utilization of Vitamin A, and hence higher prevalence in this age group.

In the present study occurrence of xerophthalmia was observed equally amongst male and female children or urban and rural communities. Prevalence of night blindness, Bitot's spot, Corneal xerosis was observed 1.32%, 3.48%, and 0.051% respectively in urban slum and 0.62%, 3.43%, and 0.31% respectively in rural area. This signify, it is public health problem according to criteria set by WHO (WHO 1982).

Smaller percentage of night blindness may be attributed to the fact that younger children having signs of Xerophthalmia might not be able to express this symptom conjunctival xerosis was observed in 3.64% in urban slums where as 2.65% in rural area.

In present study Bitot's spots were observed almost equal in urban (3.48%) and rural area (3.45%). Results reported by RCSB (Indira Bai, 1986) from Calcutta, Ranchi and Jodhpur appears to be in close agreement (3.12%, 2.98% and 3.8% respectively) with our observation. More recently a prevalence of 6.2% has been reported by Katiyar (1988).

Present study shows strong relation between xerophthalmia and pattern of breast feeding. Only 2.56%

breast fed children developed xerophthalmia where as 45.45% non breast fed children, ( $c^2=17.23$  df2 HS  $P<0.05$  urban slum and  $c^2=11.23$  df2 HS  $P<0.05$ ). This is probably due to the fact that breast milk is main source of Vitamin A in infants and breast fed children are protected from infections.

As Vitamin A is present in mother's breast milk and weaning food material. In this study much variation has not been observed among children who had weaning at or below 4 months (5.99%) or above 4 months (6.89%).

In present study it was observed that out of 49 non immunized children 19 (38.78%) developed xerophthalmia where as only 21 (2.57%) out of 817 fully immunized children developed xerophthalmia.

Relative risk of xerophthalmia in children who were non immunized was estimated 2.14% in urban slums and 4.57% in rural areas.

According to WHO 2001 (Indicator for assessing Vitamin A deficiency and their application in monitoring and evaluating intervention programmes), the risk of Vitamin A deficiency is increased when coverage rate for complete immunization, particularly measles fall below 50% for 12 - 23 months old children.

**Recommendations:** the present study has shown that the problem of xerophthalmia is equally prevalent in urban slums and rural areas, which shows that the causative factors for the problem are same in both areas. it is recommended that general environmental conditions to be improved which influence health status of children. IEC to strengthen the immunization acceptability, exclusive breast feeding in infants should be promoted. There should be low cost weaning food through community participation.

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**DISEASES ARE BEST TO BE PREVENTED**

***IF NOT***

**SHOULD BE TACKLED PROPERLY.**