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Assessment of Vitamin A supplementation coverage and factors affecting it in an urban slum of Mumbai.

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Abstract:
Background*: Vitamin A is necessary not only for prevention of xerophthalmia but also for preserving integrity and maintaining the function of several organs in the body. Available evidence has established the role of vitamin A in preventing childhood morbidity and mortality[1,2]. Vitamin A deficiency is a major cause of morbidity and mortality in India and other developing countries [3]. An estimated 5.7% children in India suffer from eye signs of vitamin A deficiency [4]. Although, vitamin A deficiency can occur in any age group, the most serious effects are usually seen in the preschool children[5]. So this study was done to assess vitamin A coverage and factors influencing it.*
Materials and Methods*: This study was done in an urban slum using WHO 30 cluster sampling method from January 2011 to November 2012. Total 210 children in the age of 2-3 years were selected. Preformed, pre-tested, semi-structured questionnaire was devised to collect information from a mother-child unit after obtaining consent. Household were selected randomly. Data was analyzed by appropriate statistical tests*
Results*: The vitamin A coverage was 38%. In 34.76% of children vitamin A coverage status was complete while it was incomplete in 3.34 % and 61.95% of women were not aware of the status. Coverage of vitamin A was statistically significant with education of mother and socioeconomic status of family(p value < 0.05), while it was insignificant in relation to gender, religion and birth order of the child.*
Conclusion: *Vitamin A coverage was poor in study area and education of mother & socioeconomic status of family adversly affect it. .*
Key Word*: Vitamin A, Coverage, Urban Slum*

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I. Introduction

Vitamin A is necessary not only for prevention of xerophthalmia but also for preserving integrity and maintaining the function of several organs in the body. Available evidence has established the role of vitamin A in preventing childhood morbidity and mortality[1, 2]. Vitamin A deficiency is a major cause of morbidity and mortality in India and other developing countries [3]. An estimated 5.7% children in India suffer from eye signs of vitamin A deficiency [4]. Although, vitamin A deficiency can occur in any age group, the most serious effects are usually seen in the preschool children[5].Vitamin A requirement in the fast-growing age group of two to four years is the greatest since dietary intake is precarious and illnesses such as diarrhea, acute respiratory tract infection and measles, which deplete vitamin A reserves, are common. Currently, vitamin A deficiency is considered to be a public health problem in selected geographical areas in India with superimposed wide variations within the regions.

Under vitamin A supplementation program that is integrated through Reproductive and Child Health (RCH) program and now National Rural Health Mission (NRHM), children between 9 and 36 months of age are to be provided with vitamin A solution every six months starting with 1, 00,000 IU at nine months of age with measles vaccination and subsequently 2, 00,000 IU every six months till 36 months of age[6].

With rapid urbanization in India and one of the highest growth rates in the world, around 93.06 million (7.75 %) of the total population is forced to reside in urban slums (Census 2011).

II. Material And Methods

This community based descriptive epidemiological study was carried out in an urban slum field practice area of Urban health training center of a tertiary care teaching hospital in Mumbai. WHO 30 cluster sampling was used to collect data from January 2011 to November 2012. A total 210 children (both male and females) of aged 2-3 years were selected for this study.

Study Design: Community based descriptive epidemiological study.

Study Location: Study was conducted in Cheetah Camp community which is a resettlement colony since 1977, in north eastern part of Mumbai. It is a field practice area under department of Community Medicine of a Municipal Medical College.

Study Duration: January 2011 to November 2012.
Sample size: 210 children.
Sample size calculation: According to the WHO 30 cluster sampling method, the 30 clusters in the community were demarcated. From each cluster, 7 respondents from the age group 2-3 years were selected. So, 30 * 7 = 210 was the sample size.
In order to decide clusters, sampling interval is calculated as follows.

Sampling interval = Total population / total no. Clusters
= 79,783 / 30
= 2659.5 = 2660

Sectors	Total Population	Cumulative Population	Clusters
A	7650	7650	1, 2
B	10378	18028	3,4,5,6
C	10957	28985	7,8,9,10
D	12812	41797	11,12,13,14,15
E	11374	53171	16,17,18,19
F	7020	60191	20,21,22
G	9350	69541	23,24,25,26
H	1900	71441	
I	943	72384	27
J	5437	77821	28,29
K	1962	79783	30

Subjects & selection method: Ethics committee approval was obtained from parent institution. Preformed, pre-tested, semi-structured questionnaire was devised to collect information from a mother-child unit. Household were selected randomly. In one household only one child was selected. When more than one eligible child was found in a single household then one out of them was selected randomly.

Inclusion criteria:
1) All children between 1 to 2 years of age were included, in accordance with NFHS 3.
2) All children whose parents are staying for at least 6 months in study area

Exclusion criteria:
All children whose parents not willing to give consent.

Statistical analysis
The collected data was numerically coded and entered in Microsoft Excel 2007, and then transferred to the SPSS (version 16). Data was analyzed by applying percentages, chi square test. For all the statistical tests, a "p value of < 0.05" was considered as statistically significant

III. Result

Table 1: Vitamin A coverage status

Vitamin A coverage status	Percent	Frequency
Complete	34.76	73
Do not know	61.9	130
Incomplete	3.34	7
Total	100	210

In 34.76% of children vitamin A coverage status was complete while it was incomplete in 3.34 % and 61.95 of women were not aware of the status.

Table 2– Association between vitamin A coverage status and gender of the children.

Sex	Status			Total
	Complete	Do not know	Incomplete	
F	34(36.56%)	58(62.37%)	1(1.07%)	93(100%)
M	39(33.33%)	72(61.54%)	6(5.13%)	117(100%)
Total	73(34.76%)	130(61.90%)	7(3.33%)	210(100%)

Pearson Chi-square value	Df	P	Significance
2.714	2	0.257	Not significant

According to above table, the gender of child did not significantly affect the vitamin A coverage status of the child.

Table 3 – Association between vitamin A coverage status and religion of the children.

Religion	Status			Total
	Complete	Do not know	Incomplete	
Christian	3(75%)	1(25%)	0(0%)	4(100%)
Hindu	15(40.54%)	20(54.05%)	2(5.40%)	37(100%)
Muslim	55(32.54%)	109(64.50%)	5(2.96%)	169(100%)
Total	73(34.76%)	130(61.90%)	7(3.33%)	210(100%)

Pearson Chi-square value	Df	P	Significance
4.57	4	0.334	Not significant

There was no significant association between vitamin A coverage status and religion of the children.

Table 4– Association between vitamin A coverage status and education of mother.

Education-Mother	Status			Total
	Complete	Do not know	Incomplete	
Graduate	8(88.89%)	1(11.11%)	0(0%)	9(100%)
Higher Secondary	30(88.24%)	2(5.88%)	2(5.88%)	34(100%)
Secondary	0(0%)	30(100%)	0(0%)	30(100%)
Primary	0(0%)	23(100%)	0(0%)	23(100%)
Illiterate	35(30.70%)	74(64.91%)	5(4.39%)	114(100%)
Total		130(61.90%)	7(3.33%)	210(100%)

	73(34.76%)			

Pearson Chi-square value	Df	P	Significance
91.2	8	0	Significant

There was significant association between education of mother and vitamin A coverage status.

Table 5 – Association between vitamin A coverage status and socioeconomic status of family.

Modified Prasad	Status			Total
	Complete	Do not know	Incomplete	
1	0(0%)	2(100%)	0(0%)	2(100%)
2	11(84.62%)	2(15.38%)	0(0%)	13(100%)
3	11(73.33%)	4(26.67%)	0(0%)	15(100%)
4	32(31.37%)	66(64.71%)	4(3.92%)	102(100%)
5	19(24.36%)	56(71.80%)	3(3.85%)	78(100%)
Total	73(34.76%)	130(61.90%)	7(3.33%)	210(100%)

Pearson Chi-square value	Df	P	Significance
29.72	8	0	Significant

This shows that there was significant association between vitamin A coverage status and socioeconomic status of family**.**

Table 6 – Association between vitamin A coverage status and birth order.

Birth order	Status			Total
	Complete	Do not know	Incomplete	
1	22(42.31%)	29(55.77%)	1(1.92%)	52(100%)
2	40(38.84%)	58(56.31%)	5(4.85%)	103(100%)
3	8(22.22%)	27(75%)	1(2.78%)	36(100%)
4	1(10%)	9(90%)	0(0%)	10(100%)
5	2(22.22%)	7(77.78%)	0(0%)	9(100%)
Total	73(34.76%)	130(61.90%)	7(3.33%)	210(100%)

Pearson Chi-square value	Df	P	Significance
10.31	8	0.244	Not significant

There is no significant association between vitamin A coverage status and birth order.

IV. Discussion

Vitamin A coverage status (Table 1)–

In 34.76% of children vitamin A coverage status was complete while it was incomplete in 3.34 % and 61.95 of women were not aware of the status. This means that total 38% of children had received at least one or all the doses of vitamin A according to age.

While a study conducted by Padam Singh and R.J. Yadav [7] on Immunization status of children of India showed 59 % vitamin A coverage status in India. This difference was mainly due to lack of knowledge in mothers about vitamin A schedule.

Association between vitamin A coverage status and gender of the children (Table 2)- According to table, the gender of child did not significantly affect the vitamin A coverage status of the child. The ignorance of the mother about vitamin A was reflected in children of both sexes not receiving the complete schedule of vitamin A doses.

Association between vitamin A coverage status and religion of the children (Table 3)- There was no significant association between vitamin A coverage status and religion of the children.

Association between vitamin A coverage status and education of mother (Table 4) -
There was significant association between education of mother and vitamin A coverage status. This result was similar to the study done in Bangladesh by Richard D. Semba[8] et al which shows significant association between maternal education of ≥10 years with vitamin A prophylaxis. (PR 1.09, 95% CI 1.04-1.13).
Similar study was done by Richard D. Semba[9] et al in India shows maternal education of ≥10 y [odds ratio (OR) 2.22; 95% CI 1.69–2.91], 7–9 y (OR 1.99; 95% CI 1.57–2.53), or 1–6 y (OR 1.65; 95% CI 1.28–2.13) compared with no education was an important factor related to receipt of vitamin A.
This shows that education of females can help to improve coverage of vitamin A as it creates awareness about the vitamin and its importance.

Association between vitamin A coverage status and socioeconomic status of family (Table 5) –
This shows that there was significant association between vitamin A coverage status and socioeconomic status of family**.** This result was similar to the study done in Bangladesh by Richard D. Semba[8] et al which shows significant association between vitamin A coverage status and socioeconomic status of family.

Association between vitamin A coverage status and birth order (Table 6) –
There is no significant association between vitamin A coverage status and birth order. The overall ignorance about vitamin A has been reflected in the coverage without affecting any particular birth order.

V. Conclusion

The vitamin A coverage was 38%. In 34.76% of children vitamin A coverage status was complete while it was incomplete in 3.34 % and 61.95% of women were not aware of the status.
Coverage of vitamin A was statistically significant with education of mother and socioeconomic status of family, while it was insignificant in relation to gender, religion and birth order of the child.

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