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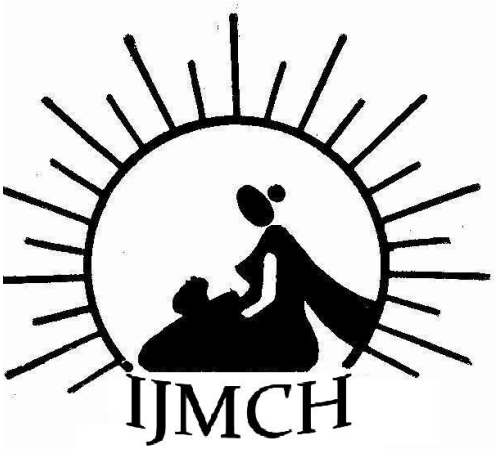

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1) What is the prevalence of clinical VAD amongst preschool going children (9-71 months) in Rural areas of Kancheepuram district of Tamil Nadu?

2) What is the dietary intake of Vit. A in above group?

Prevalance of Clinical Vitamin A Deficiency (VAD) amongst Preschool going Children in Rural Areas of Kancheepuram District (Tamil Nadu)

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ABSTRACT

Research Question: 1) What is the prevalence of clinical VAD amongst preschool going children (9-71 months) in Rural areas of Kancheepuram district of Tamil Nadu?

2) What is the dietary intake of Vit. A in above group?

Methodology: A community-based cross sectional two stage study was conducted in the catchment area of Rural Health Training Centre (RHTC) of SRM Medical College Hospital and Research Centre (SRMMCH&RC) amongst children, 9–71 months of age, attending Anganwadi.

Results: A total of 240 children formed the study population, 8 children were found positive for clinical VAD during screening but were found to be normal during final examination by an ophthalmologist. All the children were found to be consuming inadequate Vit. A in their diet. Dietary Vit A intake had a positive association with Nuclear Family and per capita income of the family.

Key-words: VAD, Bitot's Spot, Vit. A supplementation, Rural Tamil Nadu.

INTRODUCTION

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 deiciency in a population, represented by specific biochemical and clinical indicators of status. The main underlying cause of VAD as a public health problem is a diet that is chronically insufficient in vitamin A that can lead to lower body stores and fail to meet physiologic needs (e.g. support tissue growth, normal metabolism, resistance to infection etc). Deficiency of sufficient duration or severity can lead to disorders that are common in vitamin A deficient populations such as Xeropthalmia, 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.[(1)]

Vitamin A deficiency (VAD) is the leading cause of childhood blindness in the world[(2)] and is a leading cause of morbidity and mortality among pre-school children in developing countries.[(3)] Prevalence of xerophthalmia, the ocular manifestation of VAD, has been considered the primary reference standard for the assessment and determination of VAD as a public health problem.[(4)] Ocular manifestation of VAD has been classified and a detailed description of diagnostic techniques suitable for screening in field surveys including criteria and interpretation is available.[(5)] Bitot's spot, one of the ocular manifestations and most easily recognised, non-blinding signs of VAD usually affecting children aged 3-6 years is a sign of longstanding deficiency, which responds favourably to vitamin A could be a marker to identify those communities with severe and longstanding VAD. Because of the clustering[(6)] nature of VAD, identification of a single case of Bitot's spot may signify a community with VAD as a public health problem.

Provision of vitamin A supplements every four to six months is an inexpensive, quick, and effective way to improve vitamin A status and save children's lives. The Beaton Report concluded that all-cause mortality among children aged 6–59 months was reduced by 23% through vitamin A supplementation in areas where vitamin A deficiency was a public health problem. However, comprehensive control of vitamin A deficiency must include dietary improvement and food fortification in the long term.

Higher food prices increase the risk of vitamin A deficiency among preschool children in poor families, because a larger part of the household food budget is spent on grain foods and less on vitamin A-rich foods. Vitamin A supplementation is an important source of vitamin A for children.

A Vitamin A supplementation programme has been in operation in India since 1970. Under this programme, which is sponsored by the Ministry of Health and Family Welfare (GOI), children between nine months to three years are given six monthly doses of vitamin A. The supplementation programme was started as a short-term measure to prevent blindness in children and has become part of Child survival and safe motherhood program. Under the program 5 doses of Vit A are given to all children under three years of age. The first dose (1 Lakh unit) is given at nine months of age along with measles vaccination. The second dose (2 Lakhs units) is given along with DPT/OPV booster doses. Subsequent three doses (2 Lakh units each) are given at six months interval.[(7)]

Rural people of Tamil Nadu have a dietery habits which are deficient in Vit A. Tamil Nadu Government is implementing the CSSM program across the state. Present study was undertaken to determine provisional estimates of the extent of VAD amongst preschool aged children.

MATERIAL & METHODS

A cross sectional two stage study was conducted in the catchment area of Rural Health Training Centre (RHTC) of SRM Medical College Hospital and Research Centre (SRMMCH&RC) amongst children 9–71 months of age. RHTC of SRMMCH&RC is located at Mamandur in Kancheepuram district, Tamil Nadu. It has 9 villages in its catchment area and caters to a population of a little over 11500.

In the first stage a semi structured schedule was used. The schedule was pre-tested in the classroom by role-play method. 8 interns assisted by Field staff of the RHTC constituted the screening team and it was supervised by the faculty of the Community Medicine department. Briefing for the survey team was done from 1st July to 5th July 2010. The briefing session consisted of schedule's review, role-play in the classroom and WHO criteria about Vit A deficiency (VAD). Guidelines were given to the survey teams by the principal investigator. An ophthalmologist briefed them on classification of exophthalmia and how to detect them in field conditions.

In the second stage all the children found positive during screening were examined by an ophthalmologist to confirm the diagnosis.

Data collection in the field: Survey was carried out in all the anganwadis located in the catchment area of RHTC of SRMMCH&RC by four teams, each team comprised of 2 interns and one field (paramedical) staff from the department of Community Medicine. Each team was supervised and guided by a faculty of department of Community Medicine SRMMCH&RC. All the anganwadis were intimated about the schedule of visit by the team one week in advance. The mothers of the children present in the anganwadi on the day of visit were contacted and briefed about the objectives of the study. Those who consented to participate in the study were included in the study. Information as per pre-tested schedule was collected by interviewing mothers of children attending Anganwadi. Then all these children were screened for the Bitot's spot or any other conjunctival or corneal changes. The study continued till all the anganwadis were covered.

Children who were found positive by the screening team were brought to RHTC a week after the screening was over for final diagnosis by SRMMCH&RC vehicle. The mothers of concerned children were informed in advance about the date & time. At RHTC an Ophthalmologist checked them and gave a final diagnosis.

The information collected was transferred to 'Master Sheets' and analysis was done using SPSS.

RESULTS

270 children and their mothers from all the anganwadis located in the catchment area of RHTC were contacted, 240 amongst them gave consent to be part of study, of these 125 (52%) were boys and 115 (48%) were girls. There was no child less than 1 yr of age and none

who have completed 6 yrs. Only 7% were less than 2 yrs and 25% were above 5 yrs. Mean age is 3.21±1.02 (Table I). Nearly three fourths (77%) of them belonged to Nuclear families. Though the dietary intake of Vit A was substantially lower than the recommended daily allowance of 400 µg for all the age groups and all the children in study population it is observed that there was increase in the intake of vitamin A with the increase in age which is found to be statistically significant (Table II). It was observed that dietary intake of Vit A was slightly better amongst female children but it was not statistically significant (Table III). The dietary intake was calculated on the basis of the mother's last 24 hrs recall of the diet taken by the child.

Table I: Distribution of Age and Sex in the study population

AGE GROUP	MALE No. (%)	FEMALE No. (%)	TOTAL No. (%)
1 yr to <2	4(57.1)	3(42.9)	7(100)
2 to <3yr	36(61.0)	23(39)	59(100)
3 to <4yr	40(52.6)	36(47.4)	76(100)
4 to <5yr	33(45.2)	40(54.8)	73(100)
5 to <6yr	12(48)	13(52)	25(100)
TOTAL	125(52.1)	115(47.9)	240(100)

Table II: Relationship of Age with Dietary intake of Vitamin A

AGE GROUP OF CHILD	Number	Percentage	INTAKE OF VITAMIN A PER DAY (µg)
			MEAN ± S.E
1 yr to <2	7	100	128.57 ± 26.134
2 to <3yr	59	100	203.39 ± 5.890
3 to <4yr	76	100	250.13 ± 5.665
4 to <5yr	73	100	271.64 ± 7.291
5 to <6yr	25	100	276.00 ± 11.832
TOTAL	240	100	*ANOVA F = 23.27 df=4 P=0.000*

Table III: Relationship of Sex with the dietary intake of Vit A

SEX OF THE BABY	INTAKE OF VITAMIN A PER DAY(µg) MEAN ± S.E
MALE	243.08 ± 5.94
FEMALE	245.7 ± 5.67
t=-0.317 df=238 p=0.751	

Table IV: Relationship of Educational status of the mother with the dietary intake of Vitamin A

EDUCATIONAL STATUS OF MOTHER	Percentage (%)	INTAKE OF VITAMIN A PER DAY(µg) MEAN ± S.E.
ILLITERATE	20.0	255.94 ± 11.181
PRIMARY	45.0	246.57 ± 6.035
SECONDARY	33.8	236.60 ± 6.093
GRADUATE	1.3	186.67 ± 23.333
TOTAL	100	-
ANOVA F=1.183 df=3 p=0.145		

Table V: Relationship of type of family with the dietary intake of Vitamin A

TYPE OF THE FAMILY	INTAKE OF VITAMIN A PER DAY(µg) Mean ± S.E.
NUCLEAR	249.08 ± 4.649
JOINT	228.36 ± 8.503
t=2.135 df=238 p=0.034	

Table VI: Relationship of per capita income of family with the dietary intake of Vitamin A

PER CAPITA INCOME OF THE FAMILY (IN RUPESS)	INTAKE OF VITAMIN A PER DAY(µg) Mean ± S.E.
LESS THAN 570	199.92 ± 5.948
571 TO 750	241.40 ± 7.086
751 TO 1000	269.31 ± 7.472
MORE THAN 1000	273.27 ± 9.082
ANOVA F=20.809 df=3 p=0.000	

Table VII: Prevalence of Vitamin A deficiency

AGE GROUP	NO.	C/O NIGHT BLINDNESS	CORNEAL/ CONJUCTIVAL CHANGES	
			SCREENING	FINAL
1 yr to <2	7	NIL	NIL	NIL
2 to <3yr	59	NIL	1	NIL
3 to <4yr	76	NIL	3	NIL
4 to <5yr	73	NIL	4	NIL
5 to <6yr	25	NIL	NIL	NIL
TOTAL	240	NIL	8	NIL

Approximately one third (35.1%) had mothers with education level of secondary and above. 20% of the mothers were illiterate but in this study it was observed that better education level of mother leads to reduced dietary intake of Vit A, however this association was not found to be statistically significant (Table IV). The dietary intake of Vit A is better amongst the children belonging to nuclear families which are statistically significant (Table V). Mean per-capita income of the families of the study population is Rupees 871 ± 60, as expected dietary intake of Vit A increases with the increase in per capita Income and this association is found to be statistically significant (Table VI).

Though 8 children (3.33%) were suspected to be having corneal/conjunctival changes during screening, during final diagnosis by an Ophthalmologist, it was found to be normal. No child complained of night blindness (Table VII).

DISCUSSION

Present study shows that the Prevalence of Clinical VAD is Zero in study population in rural Tamil Nadu. Prevalence of clinical VAD observed in the present study is lowest amongst those recorded so far from India.[8.9.10.11.12.13] Prevalence of clinical and sub clinical VAD in India is among the highest in the world.[9] Though prevalence of clinical vitamin A deficiency is less than 1% in India, it remains the home of more than a third of the preschool children with exophthalmia in the world as reported. A survey conducted by National Nutrition Monitoring Bureau in 2006 reported the prevalence of Bitot's spot to be less than 0.5% in India, prevalence in the state of Tamil Nadu was also found to be similar.[11] The same survey also reported an association of Bitot's spot with female literacy and family size. However prevalence of clinical VAD in study population in current study was found to be Zero.

As per NHFS -3, around 50% of the children in the age group of 12 to 35 months received Vit A supplementation in last six months, whereas in the present study, we found that 100% of the children in the age group received Vit A supplementation in last 6 months. We also found that all the children in the study group received the Vit A supplementation when due to them.

Dietary intake of Vit A was found to be good in North & North- East region but was found to be inadequate across the South Indian States. The average consumption was found to be 199 µgm in Tamil Nadu, 178 µgm in Karnataka, 245 µgm in AP and 162 µgm in Kerala.[14] In the present study we found that average intake of dietary Vit A was 244.3 µgm against the recommended daily allowance of 400 µgm. We also found that the intake was better amongst female child though it was not found to be statistically significant. We also found that it has a statistically significant association with per capita income and type of the family. The dietary intake was calculated on the basis of the mother's last 24 hrs recall of the diet taken by the child.

CONCLUSION

We may conclude that prevalence of clinical VAD is Zero in the study area of rural Tamil Nadu. The main reason for it is the Implementation of Vit A supplementation program. It is universally accessible resulting in excellent utilization. This study observed that dietary intake of Vit A is poor amongst the children. There is need for a bigger study comprising districts from all parts of Tamil Nadu to make a more definitive conclusion. A sustained and focussed IEC campaign to improve the awareness amongst community about micronutrient requirement and problems due to its deficiency will help in improving community participation leading to improving the dietary intake of micronutrient rich food especially Vit A rich food. People may also be educated and encouraged to grow Vit A rich vegetable leading to its improved consumption.

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