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SHORT COMMUNICATION

Correlates of vitamin A deficiency among Indian rural preschool-age children

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PURPOSE. *In India, 52,000 children go blind every year on account of vitamin A deficiency. The purpose of the study was to determine the correlates of vitamin A deficiency among 4,205 preschool-age children.*
METHODS. *Case-control study in Bihta Primary Health Center area, Bihar, India. Main outcome measures were dietary habits, maternal literacy, and birth order.*
RESULTS. *Vitamin A deficiency was found to be significantly higher ($p<0.01$) in children on a vegetarian diet (7.14%) (OR 5.32). Children born to a literate mother had a prevalence of only 1.35% in relation to a corresponding value of 4.11% in children born to illiterate mothers ($p<0.01$) (OR 3.15). Birth order of preschool-age children was significantly related to vitamin A deficiency. In birth order less than or equal to three, the prevalence was 2.81%, in comparison to those with birth order four or more, in whom the magnitude was significantly higher ($p<0.01$) at 5.61% (OR 2.08). (Eur J Ophthalmol 2007; 17: 1007-9)*

KEY WORDS. *Vitamin A deficiency, Preschool-age children, Dietary habits, Maternal literacy, Birth order*

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INTRODUCTION

Vitamin A deficiency disorder spectrum has the distinction of being one of the most important causes of preventable blindness worldwide (1), and xerophthalmia remains a problem in developing countries [(Report of a Joint Who/Unicef/Usaid/Helen Keller International/ IVACG Meeting: Control of Vitamin A Deficiency and Xerophthalmia (Tech. Rep. Ser. 672). Geneva: WHO; 1982)]. In India, 52,000 children go blind every year on account of vitamin A deficiency (2, 3). Studies in the recent past have shown that not only does vitamin A deficiency cause blindness but it also has a profound impact on general morbidity, mortality, and growth (3, 4). Correlates of preventable disease were unearthed in the present study among preschool-age children.

MATERIALS AND METHODS

This case-control study, performed among 4205 preschool-age children from 14 villages at the Bihta Primary Health Center, Bihar, India, was performed from 1996 to 1998. Simple random sampling was used. The main outcome measures were correlates of vitamin A deficiency (dietary habits, maternal literacy, and birth order) in cases and controls.

Content validity and reliability of study instruments

The survey module was developed based on information provided in a WHO publication from global experts prior to the study for ensuring feasibility, acceptability, time man-

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TABLE I - CORRELATES OF VITAMIN A DEFICIENCY AMONG INDIAN RURAL PRESCHOOL-AGE CHILDREN

Correlates	No. of observations	Vitamin A deficient	Not vitamin A deficient	Odds ratio
Dietary habit				
Vegetarian	1470	105 (7.14)	1365 (92.86)	5.32
Nonvegetarian	2735	39 (1.42)	2696 (98.58)	
Maternal literacy				
Illiterate	3163	130 (4.11)	3033 (95.89)	3.15
Literate	1042	14 (1.35)	1028 (98.65)	
Birth order				
≥4	899	51 (5.61)	848 (94.39)	2.08
≤3	3306	93 (2.81)	3213 (97.19)	

Values are n (%)

agement, and reliability. Night blindness along with Bitot's spot was taken as case definition. A pilot study was done in the study area to finalize the survey questionnaire.

Data collection procedure

A total of 4205 children were selected by simple random sampling from 24,350 preschool-age children from 14 villages in the Bihta Primary Health Center area. A total of 144 children were diagnosed with vitamin A deficiency among 4205 preschool-age children by ocular signs and symptoms as per WHO guidelines. Dr. Vidyasagar was specially trained at the department of Ophthalmology, Patna Medical College and Hospital, where all the positive cases were referred for confirmation of diagnosis. A pre-tested questionnaire was then administered by him to the caregivers of all these preschool-age children by interview.

Statistical analysis

SPSS 10.0 for windows XP was used.

RESULTS

A total of 144 children younger than 5 years were diagnosed with vitamin A deficiency in a population-based cross-sectional study. In the history taken from caregivers on dietary habits, vitamin A deficiency was found to be significantly higher ($p<0.01$) in children on a vegetarian diet (7.14%) (OR 5.32) (Tab. I). Comparable data on nonvegetarian children were as low as 1.42%. Effect of vegetarian diet on vitamin A deficiency among preschool-age children was not similar to findings of other investigators (4, 5). Maternal literacy had a profound effect on vitamin A deficiency in our study. Children born to a literate mother had a prevalence of only 1.35% in relation to a corresponding value of 4.11% in children born to illiterate mothers ($p<0.01$) (OR 3.15). Researchers in this field found similar findings (6). Birth order of preschool-age children was significantly related to vitamin A deficiency in our study sample. In our study, for preschool-age children of birth order less than or equal to three, the prevalence was 2.81%, in comparison to those with birth order of four or more, in whom the magnitude was significantly higher ($p<0.01$) at 5.61% (OR 2.08) Other authors found comparable observations (6). The general population was counseled through multiple sessions of health education interventions to effect changes in dietary habits by consuming vitamin A–rich, locally available, affordable foods, and they were encouraged to participate in a vitamin A supplementation program.

CONCLUSIONS

Dietary habits, maternal literacy, and birth order of preschool-age children were important correlates of vitamin A deficiency in rural India and a major cause of blind-

ness in childhood, affecting large numbers of children. A multiprong approach consisting of megadosing of vitamin A, primordial preventive school health program, and behavior change communication including dietary modifications at household unit levels is the best strategy to combat vitamin A deficiency in India.

Proprietary interest: None.

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