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DIETARY PRACTICES AND XEROPHTHALMIA IN UNDER-FIVES IN JIMMA TOWN, SOUTHWEST ETHIOPIA.
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ABSTRACT

Objectives: **To assess parent's knowledge about children's need for plant sources of vitamin A; to determine the dietary practice with regard to vitamin A intake; to estimate the prevalence of xerophthalmia and; to forward appropriate recommendations.**
Design: A **cross-sectional study.**
Setting: **The study was conducted in Jimma town, southwest Ethiopia, with a total population of about 88,867 from February to April 1995.**
Participants: **Eight hundred and thirty one randomly selected children between the ages of six and 59 months formed the study population.**
Main outcome measures: **The dietary intake of cheap and easily available vitamin A rich foods is assessed and prevalence of xerophthalmlia determined.**
Results: **Only eighty per cent of the children were getting green vegetables, fruits or carrots once weekly or more. The major reasons given for not including vegetables, fruits and carrots in the diet were "cannot afford" (39%), "not available" (33%), and "child too young" (16%). Out of 628 children examined, four (0.6%) were found to have xerophthalmia; three (0.48%) classified as XlB and one (0.16%) as X2.**
Conclusion: **The dietary intake of plant sources of vitamin A in the studied community is far from adequate. Moreover, vitamin A deficiency is found to be a significant public health problem in young children in Jimma town. Periodic vitamin A supplementation, preferably combined with immunisation, should be a priority action, and parents need to be educated about vitamin A deficiency and its prevention.**

INTRODUCTION

Xerophthalmia, which results from vitamin A deficiency, ranges from the mildest form, night blindness, through reversible signs in the eye, to ulceration and destruction of the cornea, eventually leading to blindness(1). Furthermore, there is a body of evidence implicating vitamin A deficiency in increased morbidity and mortality in children(1-5). According to a study conducted in Ghana, vitamin A supplementation in children appeared to decrease severity of illness. The same study also documented a nineteen per cent reduction in all-cause mortality with vitamin A supplementation(2). These effects are observed in children who do not necessarily have eye signs, but may have sub-clinical deficiency(1). However, it is worth noting that some workers have failed to document beneficial effects of massive dose vitamin A on morbidity and mortality(6).

An estimated 2.8 million children aged less than five years are clinically affected by vitamin A deficiency in the world and 258 million are sub-clinically affected(5). Vitamin A deficiency is prevalent in much of Ethiopia. In a nationwide survey, Wolde-Gebriel *et al*(7), found Bitot's spots in one per cent of children six to 72 months of age and serum retinol level determination showed vitamin A deficiency in sixteen per cent. Xerophthalmia prevalence rates of about six per cent have been reported in children from south and southwest parts of the country(8,9), and the prevalence appears to vary in association with cropping and settlement patterns(7,10).

In the developing regions of the world more than 70% of vitamin A is derived from plant sources. These include green leafy vegetables, carrots, various fruits, sweet potatoes and palm oil. The proportion coming from animal products tend to be more in higher income countries(1). Information on local dietary practices is useful in order to select appropriate preventive strategies.

This study was conducted as part of a nutritional survey in Jimma town, southwest Ethiopia. The objectives of the study were: (i) to assess parent's knowledge about children's need for plant sources of vitamin A; (ii) to determine the dietary practice with regard to vitamin A intake; (iii) to estimate the prevalence of xerophthalmia and; (iv) to forward appropriate recommendations.

MATERIALS AND METHODS

The study was conducted between February and April 1995 in Jimma town, southwest Ethiopia. The town is divided into 19 small administrative units known as *kebeles* and has a population

of about 88,867(11). The xerophthalmia survey was conducted during a nutritional survey. The sample size was set at 831(12).

Six *kebeles* were randomly selected and a census of children six to 59 months of age was done. Eight hundred and thirty one households where children in the specified age group lived were randomly selected from the six clusters with probability proportional to size using computer generated random numbers. Where more than one under-five children live in the same household the youngest was selected for the study.

A pretested questionnaire was administered to parents (guardians) at their homes. The data collected included child' s and parents' particulars, and the knowledge of parents about the need for vegetables and fruits in child feeding. The dietary history of the child was also collected by asking the parent (guardian) about the food the child was given in the preceding 24 hours. If green vegetables, fruits, or carrots are mentioned in the 24-hour dietary recall, the frequency of intake was inquired. On the other hand when the history did not include all or any of these plant sources of vitamin A, the parent was directly asked as to whether the child ever got vegetables, fruits, or carrots and how frequently. History of night blindness was also asked.

The sampled children were given appointment to come to the examination sites for anthropometric measurements and eye examination. Weight and height were measured by trained medical students. Three paediatricians, including two of the authors did clinical examination for xerophthalmia. Six hundred and sixty nine children (out of 831) were brought to the examination sites and data on xerophthalmia were complete in 628. Children who were found to have xerophthalmia were referred to Jimma hospital for treatment.

In this study, xerophthalmia was diagnosed clinically in the presence of night blindness, conjunctival xerosis, Bitot's spots or corneal lesions (xerosis, ulceration or keratomalacia) and the World Health Organisation (WHO) classification for xerophthalmia was used(13). Bitot's spots with conjunctival xerosis were classified as XlB and corneal xerosis as X2.

Data were entered and analysed using EPI-Info version 6 statistical software.

RESULTS

A total of 831 randomly selected children between six and 59 months of age living in Jimma town, southwest Ethiopia, were involved in a nutritional survey. The study was conducted between February and April 1995.

Knowledge and practice: Parents or guardians (589 fathers and 818 mothers) of the surveyed children were asked, "Does a child need vegetables and fruits?". Almost all (95.4% of the fathers and 95.1% of mothers) said children need to get both vegetables and fruits. Only 0.8% of the fathers and 1.1% of the mothers responded by saying vegetables and fruits are not necessary. The remaining few believed that children only need either vegetables or fruits, but not both.

Regarding dietary practice, about a half (49%) of the studied children were getting carrots, though not regularly (data not shown). Overall, about 78% of the children were reportedly getting green vegetables, fruits or carrots. However, most of these children (90%) were given vegetables, fruits or carrots occasionally, that is, less than once per week. In nearly 22% of the children their diet did not include plant sources of vitamin A. The reasons given by parents or guardians for excluding vegetables and fruits from the child's diet included "cannot afford" (39%), "not available" (33%) and "child too young" (16%) (Table 1).

Table 1

Intake of vegetables, fruits or carrots in under-five children

Variable	No. (%)
Child gets vegetables/ fruits/ carrots (n=803):	
Daily	15 (1.9)
At least once/ week*	48 (6.0)
Less than once/ week	566 (70.4)
Not at all	174 (21.7)
Reason for not getting vegetables/ fruits/ carrots (n=174):	
Cannot afford	67 (38.5)
Not available	58 (33.3)
Child too young	28 (16.1)
Child refused	11 (6.3)
Not necessary	6 (3.4)
Others	4 (2.3)

* Less frequent than daily but at least once per week.

Prevalence of xerophthalmia: Out of the 831 children enrolled in the nutritional survey, 669 were brought to examination sites. Information on the clinical signs of vitamin A deficiency was complete in 628 children. Four children were found to have signs of xerophthalmia giving a prevalence of 0.6%; three (0.48%) children were classified as XlB and one (0.16%) as X2. The frequency of clinical signs is shown in Table 2. Night blindness was not reported in any child.

Table 2

Xerophthalmia in 628 children between 6-59 months of age

Signs of vitamin A deficiency/ classification	No. (%)
Signs of xerophthalmia (n=628)	
conjunctival xerosis	3 (0.48)
Bitot's spots	3 (0.48)
Corneal xerosis	1 (0.16)
Classification of xerophthalmia:	
XlB	3 (0.48)
X2	1 (0.16)
Prevalence of xerophthalmia:	4(0.64)

The ages of the four children with xerophthalmia ranged between 41 and 55 months and three of the cases

were males. All were from low socio-economic background and their mothers were either illiterate(2) or had only a primary level education(2). During the survey all were getting the staple diet of the area, called, *injera* (thin bread made from cereal flour) with sauce, and none of them were getting animal food. Vegetables, fruits and carrots were not included in the diet of two of the children. On anthropometric measurements, all were found to have protein-energy malnutrition (PEM): two were stunted, one wasted and one was both wasted and stunted.

DISCUSSION

Vitamin A deficiency is a preventable cause of blindness. Moreover, it is associated with increased morbidity and mortality in children(1-5).

Although almost all of the interviewed parents believed that children need to consume vegetables and fruits, only eight per cent of the children were getting green vegetables, fruits or carrots once per week or more. This finding has serious implications particularly when one considers the fact that plant sources are the major sources of vitamin A in low-income communities(1). The availability of vegetables and fruits can be improved, as vitamin A rich plants can easily be grown in the area. On the other hand, some of the reasons given by parents/guardians for not including vegetables, fruits and carrots in the diet of their children including "child too young", "child refused", and "it is not necessary" indicate a knowledge and/or attitude gap that need to be tackled through health education.

The prevalence of xerophthalmia in children between six and 59 months of age living in Jimma town was found to be 0.6%. Higher prevalence rates have been reported from other parts of the country(8,9). Nevertheless, a corneal xerosis rate of about 0.2% in the current survey is above the level proposed by the WHO for public health significance(13). Furthermore, as xerophthalmia is only the "tip of the iceberg", a large proportion of children will be expected to have sub-clinical vitamin A deficiency, which puts them at increased risk of severe illness and mortality(3).

The number of children with xerophthalmia was too small to allow meaningful analysis. The observation that all four were over three years of age, had PEM, and came from low socio-economic background is striking. Others too (10,14,15) have made similar observations.

Night blindness was not reported in any of the children studied. We observed that most parents were not certain about the presence or absence of night blindness in a child although many are familiar with the symptom. This shows the difficulty in detecting night blindness in young children.

In conclusion, in young children living in Jimma town the dietary intake of green vegetables, fruits and carrots, which are good sources of vitamin A, is found to be far from adequate. Moreover, the xerophthalmia survey documented that vitamin A deficiency is a significant public health problem. Periodic vitamin A supplementation, preferably combined with immunisation, should be a priority action. Along with vitamin A supplementation nutritional education should be conducted, and parents need to be educated about vitamin A deficiency and its prevention.

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