

Prevalence of Night Blindness among Children in Elhag Yousif Area, Khartoum, Sudan

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Abstract: A cross-sectional community-based study was conducted in El-Hag Yousif area, Khartoum, Sudan to measure the prevalence of night blindness in children. A total of 272 children were selected from four clusters in the study area using simple random sample technique. The diagnosis of night blindness was based on World Health Organization criterion which is identifying the blind children by lack of vision or inability to see well at night or in dim light. The prevalence of night blindness among children was 2.6%. The prevalence in females was 1.5%, males 1.1%, and in children less than 4 years was 4.2%. No statistical association found between night blindness and child sex and age. There was statistical significance of lack of vitamin A supplementation on prevalence of night blindness (Relative Risk = 4.732, 95% Confidence Interval from 1.337 to 16.749). The study concluded that the prevalence of night blindness was high and application of vitamin A supplementary was rapidly needed to prevent increasing of the problem.

Key Words: prevalence, night, blindness, vitamin A, children, Sudan.

I. Introduction

Night blindness is one of the earliest signs of vitamin A deficiency [1]. The physical symptoms of night blindness are xerophthalmia, Pinot spots, karatomalacia and Cornea ulceration [2]. Vitamin A is an essential nutrient needed in small amounts for the normal functioning of the visual system [3]. Childhood blindness in developing countries is a result of many factors such as measles; one of these factors is vitamin A deficiency [4]. Approximately 250,000–500,000 children in the developing countries become blind each year due to vitamin A deficiency, with highest prevalence in Africa and South East Asia [1]. In areas where VAD is common there is usually one or more phrase in the local language for the inability to see well at night [5].

Health consequences of vitamin A deficiency include mild to severe systemic effects on innate and acquired mechanisms of host resistance to infection and growth, increased burden of infectious morbidity, mild to severe (blinding) stages of xerophthalmia, and increased risk of mortality [6]. Prevalence of vitamin A deficiency was found to be 8.3% as indicated by conjunctival and corneal xerosis, while 0.9% had night blindness [7]. The incidence of night blindness was to be 0.9% in a study conducted among khalwa students which is a non-governmental boarding school specialized in teaching Quran to Sudanese children [1].

II. Materials And Methods

2.1. Study Area

El-Hag Yousif area is located in Sharg Al-Nil locality, Khartoum capital of the Sudan. It is populated by 542289 persons. The number of children in the area is 125257. It is divided into 12 clusters. The socio-economic status of population in the area is poor compared to other areas in Khartoum. It lacks necessary health services such sufficient safe water, sanitary disposal of sewage, equipped hospitals and others.

2.2. Study Population and Sampling

The study population was children up to 15 years in the area. About 272 of them were determined as a sample size according to statistical equation. Four clusters out of the twelfth clusters were selected randomly to be included in the study. The study group was selected from studied clusters equally. Inside cluster, simple random sample technique was used.

2.3. Ethical Clearance

Ethical clearance was obtained from Khartoum State Ministry of Health. Informed consents were given by families of studied children.

2.4. Data Collection and Analysis

A questionnaire was used to collect data from study group. Most of children mothers have participated in answering the questions. The diagnosis of night blindness based on World Health Organization diagnostic

criterion which is lack of vision or inability to see well at night or in dim light. Statistical tests i.e. odds ratio, p value and relative risk were used to measure the association between different variables.

III. Results

The prevalence of night blindness among children in Elhag Yousif Area, Khartoum, Sudan was 2.6% (table 1). The prevalence among females was 1.5% while in males was 1.1% (table 2). In table 3, prevalence of night blindness in children less than 4 years was 4.2%, in age group 4 – 7 was 2.3%, in age group 8 – 11 was 1.3% and in age group 12 – 15 was 2.8%. The prevalence of night blindness in children who were not receiving vitamin A dose was 11.1% while among those receiving vitamin A supplementary the prevalence was 0.8% (Relative Risk = 4.732, 95% Confidence Interval from 1.337 to 16.749) as shown in table 4.

Table (1) Prevalence of night blindness among children in Elhag Yousif Area, Khartoum, Sudan (n = 272)

Night blindness	No	%
Blind	7	2.6%
Not blind	265	97.4%
Total	272	100%

Table (2) Sex distribution of night blindness among children in Elhag Yousif Area, Khartoum, Sudan (n=272)

Sex	Blind		Not blind		Total		OR	95% CI
	No	%	No	%	No	%		
Male	3	1.1%	130	47.9%	133	48.9%	0.7788	0.171 - 3.5476
Female	4	1.5%	135	49.5%	139	51.1%		
Total	7	2.6%	265	97.4%	272	100%		

OR = Odds Ratio, CI = Confidence Interval

Table (3) Age distribution of night blindness among children in Elhag Yousif Area, Khartoum, Sudan (n=272)

Age (years)	Blind		Not blind		Total		Chi square	P value
	No	%	No	%	No	%		
>4	3	4.2%	69	95.8%	72	26.5%	1.26	0.74
4 – 7	2	2.3%	85	97.7%	87	32%		
8 – 11	1	1.3%	76	98.7%	77	28.3%		
12 – 15	1	2.8%	35	97.2%	36	13.2%		
Total	7	2.6%	265	97.4%	272	100%		

Table (4) Relationship between Vitamin A supplementary and night blindness among children in Elhag Yousif Area, Khartoum, Sudan (n = 272)

Vitamin A dose	Blind		Not blind		Total		RR	95% CI
	No	%	No	%	No	%		
Not received	2	11.1%	16	88.9%	18	6.6%	4.732	1.337 - 16.749
Received	5	0.8%	249	99.2%	254	93.4%		
Total	7	2.6%	265	97.4%	272	100%		

RR = Relative Risk, CI = Confidence Interval

IV. Discussion

Night blindness among children is a serious public health problem due to its effect on their health and daily activities. The problem is due to several factors, however the main reasons is vitamin A deficiency (VAD). The present study measured the prevalence of night blindness in children as a community-based study, and it was found to be 2.6%. Although, it is high prevalence compared with other regions, Abdelmoneim et al (2012) in a survey conducted in Sudan at Umm-dawanban Maseed, a traditional boarding school, where the Quran is taught, found that the prevalence of night blindness was 23.6%. Also Mohammed et al (2014) reported that the incidence of night blindness was to be 0.9% In a study conducted among khalwa students which is a non-governmental boarding school specialized in teaching Quran to Sudanese children [1].

In the present study it has been observed that night blindness has no association neither with child sex (odds ratio = 0.7788, 95% confidence interval = 0.171 - 3.5476) nor with child age ($\chi^2 = 1.26$, p value = 0.74) in developing night blindness. Also it was found that no significant association was observed between the differences in mean age and development of night blindness (P = 0.657) [8].

Vitamin A was associated with night blindness; the prevalence of night blindness was low in children who received doses of vitamin A supplementation (Relative Risk = 4.732, 95% Confidence Interval from 1.337 to 16.749). Despite the small amount of vitamin A that the human body needs and the availability of the vitamin in different types of cheap vegetables, many children suffering vitamin A deficiency. It might be attributed to metabolic disturbance or loss of the vitamin in diarrhea. Vitamin A supplementation is required to improve the vitamin status. Periodic delivery of high-potency supplements of vitamin A to children is one of night blindness control [3].

V. Conclusion

The study concluded that the prevalence of night blindness was high and application of vitamin A supplementary was rapidly needed to prevent increasing of the problem.

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