Cross Sectional Study on Prevalence of Anemia Among Rural Adolescent Girls of Mandya District

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Abstract

Introduction: As per 2011 census, there are about 253.2 million adolescents in India, which accounts to 20.9) of the population. Adolescence is considered as a nutritionally critical period of life and among adolescents; girls constitute a more vulnerable group. They suffer from various nutritional deficiencies among which majority of them suffer from anemia of different severity mainly due to nutrition (inadequate intake/absorption). Improving the haemoglobin status will not only reduce the mortality and morbidity among adolescent but will also have impact on the intergenerational cycle of malnutrition. The objectives of the present study was to determine the prevalence of anemia among rural adolescent girls and to determine the association between anemia and socio demographic variables. *Settings and Design:* This is a cross sectional study, conducted in a rural area of Mandya district from August 2014 to July 2015. *Methods and Materials:* Adolescent girls (10 to 19 years) included in the study were 302 from randomly selected villages under the purview of Rural Health Training center, MIMS Mandya. The data was collected using petested semistuctured questionnaire and hemoglobin estimation was done by using Sahlis method. *Statistical Analysis used:* Descriptive statistics and Chi square test. *Results:* Prevalence of anemia was 87.1% (mild anemia-46.4, moderate anemia-40.7). None of the adolescent girls were having severe anemia. There was significant association between anemia and education level of adolescent girls, socio economic status, mencheal status. *Conclusions:* Prevalence of anemia among adolescent girls was high. Improving their socio economic status/affordability to consume more nutritious diet may improve their haemoglobin status

Keywords: Adolescent Girls; Malnutrition; Anemia; Nutrition.

Introduction

Adolescent girls are prone for different nutritional deficiencies among which majority of them suffer from anemia of different severity due to lack of adequate nutrition. Globally, anaemia affects 1.62 billion people, which corresponds to 24.8% of the population. The lowest prevalence is in men [1].

It is reported that 2170 million people are affected worldwide by nutritional anemia. Out of these 90% live in developing countries, especially South-East Asia. The prevalence of anemia in developing countries as a whole is 36%, whereas it is only 8% in the developed countries. Thus it is disproportionately high in developing countries [2].

World Health Organisation has defined adolescence as a period between the age group of 10 to 19 years. Around 1 in 6 persons in the world is an adolescent: that is 1.2 billion, most of them in the developing countries [3]. As per 2011 census, there are about 253.2 million adolescents in India, which accounts to 20.9% of the population [4]. According to National Health and Family Survey (NHFS-3), the prevalence of anemia among adolescent girls, 15-19 years, is 55.8% and 51.3% in Karnataka [5]. Adolescents are often thought of as a healthy group, nevertheless, many adolescents do die prematurely due to accidents, suicide, violence, pregnancy related complications and other illnesses that are either preventable or treatable [6].

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Nutritional status during adolescence will decide the wellbeing of the present as well as the future generations. Malnutrition including anemia are the major conditions affecting the health of the adolescents, which in turn affect their performance in schools/colleges [7]. Improving the nutritional status among the adolescent girls not only reduces the morbidity and mortality among them but also helps in reducing the intergeneration cycle of malnutrition which in turn helps in reducing the economic burden on the family, on the health sectors and helps in economic and social development of the country.

Objectives

1. To determine the prevalence of anemia among rural adolescent girls.

2. To determine the association between anemia and socio demographic variables.

Material and Methods

The present cross sectional study was conducted in a rural area of the Mandya Taluk, Mandya district. The Rural Health Training Center of the department of Community Medicine, Mandya Institute of Medical Sciences has 18 villages under its purview. The total population of the 18 villages is 14,303. The sample size was calculated considering prevalence of anemia as 57% according to NFHS- 3 data, q is (100–57). The permissible error of the estimate (l) was set at 10. The sample size of this study was 302.

Out of 18 villages, 3 villages were selected randomly. The combined population of the selected villages put together was 7000. The adolescent girls population constitutes about 20.9% and the population of the selected villages fulfilled our required sample size of 302. House to house visit was done in the selected villages. Among the selected villages, house to house visit was done and adolescent girls in the age group of 10 to 19 years were included in the study. Before inclusion in the study adolescents and their parent/guardian were explained about the study and informed written consent was taken. If more than two adolescent girls were found in one house, one of the adolescent was included in the study by a lottery method.

Data regarding socio-demographic characteristics was obtained by interview method using a predesigned and pretested semi structured questionnaire. Estimation of hemoglobin level was done by Sahli's method [8]. Adolescent girls included in the study were interviewed and Sahli's test for hemoglobin levels was carried out at the rural health and training centre of MIMS Mandya by taking all aseptic precautions. Determination of association between hemoglobin level and socio-demographic characteristics was done by applying chi square test. P value of less than 0.05 was considered statistically significant. Institutional ethics committee clearance was taken before initiating the study.

Results

Table 1 shows, out of 302 adolescent girl's maximum number of adolescent girls were in the group of 13 to 15 years (45.3%), followed 16-19 years (37.1%) and 10-12years (17.6%). Most of the adolescent girls very hindu by religion (97.4%). Maximum number of adolescent girls belonged to nuclear family (58.9%).

Socio economic status (SES) was assessed by modified B G Prasad's classification. Three fourth of the adolescent girls belonged to SES class III and IV i.e. 126 (41.7%) and 101 (33.7%) respectively. Less than 10% belonged to SES class II (7.6%) and SES class I (0.3%). Half of the adolescent girls were in their high school 152 (50.3%). Out of 302 adolescent girls, all of them were either doing or had completed primary schooling, 4 (1.3%) of the adolescent girls had discontinued high school and had rejoined after a year or more. 7 (1.9%) who were in college had similarly discontinued their studies in between. 15 (5.1%) adolescent girls were presently not pursuing their studies.

Figure 1 shows, As per WHO classification of adolescents girls were classified as having normal (>12gm%), mild (10-11.9%), moderate (7 - 9.9gm%) and severe anemia (<7gm%). In our study only 12.9% (39) adolescent girls were having haemoglobin ≥12gm%. Almost half of the adolescent girls had mild and moderate anaemia (46.4% and 40.7%). The total prevelance of anemia was 87.1%. None of the adolescents were severely anemic.

Table 2 shows, In the age group of 10-12years half of the adolescent girls were having anemia, either mild/moderate anaemia and 40.0% and 38.2% were having mild and moderate anemia. More than half of the adolescents had mild and moderate anemia in the age group of 13-15years & 16-19 years i.e 60.8% and 61.1% respectively. Overall the prevalence of anemia was more in the age group of 10 – 12 years (103) followed by 13-15years (81) and 16-19years (79) respectively.

Table 3 shows, Prevalence of anaemia was assessed for its association with Socio demographic variables by using chi square test. There was significant association between haemoglobin levels and education level of adolescent girls, socio economic status (p< 0.05). There was no significant association between haemoglobin status and education of their parents, type of family, religion, birth order &total family members (p>0.05).

Table 1: Socio demographic characteristics of study subjects

Socio demographic Variables		Number	Percentage
Age group in years	10-12	53	17.6
	13-15	137	45.3
	16-19	112	37.1
Education	Primary school	61	20.2
	High school	152	50.3
	College	89	29.5
Socio-economic status	Class II	23	7.6
	Class III	126	41.7
	Class IV	101	33.7
	Class V	51	16.7
Type of family	Nuclear	178	58.9
	Joint	38	12.6
	Three generation	86	28.5
Total family members	3 - 4	120	39.7
	5 or 6	136	45.0
	≥ 7	46	15.2

Table 2: Distribution of adolescent girls according to haemoglobin levels

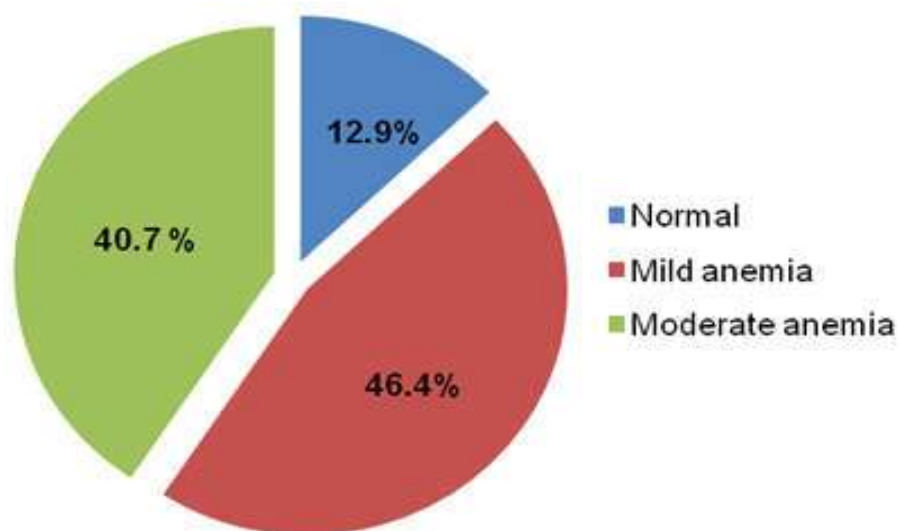| Age group in years	Haemoglobin status		
	Normal	Mild anaemia	Moderate anaemia
10-12	5 (12.8)	56 (40.0)	47 (38.2)
13-15	16 (41.0)	51 (36.4)	30 (24.4)
16-19	18 (46.2)	33 (23.6)	46 (37.4)
Total	39 (12.9)	140 (46.4)	123 (40.7)

Fig. 1: Distribution of adolescent girls according to haemoglobin levels

Table 3: Association between anemia and socio demographic characteristics

Socio demographic variables		Normal N (%)	Haemoglobin status		P value
			Mild anemia N (%)	Moderate anemia N (%)	
Education status	Primary	1 (1.6)	35 (57.3)	25 (40.9)	0.003
	High school	23 (15.1)	79 (51.9)	50 (32.9)	
	college	1 (1.6)	30 (49.2)	30 (49.2)	
Socio economic status	II	6 (26.1)	7 (30.4)	10 (43.5)	0.043
	III	20 (15.9)	59 (46.8)	47 (37.3)	
	IV	11 (10.9)	53 (52.5)	37 (36.6)	
	V	2 (4.0)	20 (40.0)	29 (58.0)	
Fathers Education	Illiterate	14 (15.9)	45 (51.1)	29 (32.9)	0.051
	High school	9 (12.7)	32 (45.1)	30 (42.3)	
	College	2 (2.8)	33 (46.5)	36 (50.7)	
Mothers education	Illiterate	13 (12.9)	47 (46.5)	41 (40.6)	0.297
	Primary	11 (16.2)	37 (54.4)	20 (29.4)	
	High school	11 (11.8)	42 (45.2)	40 (43.0)	
	College	4 (10.0)	14 (35.0)	22 (55.0)	
Total family members	3-4	13 (10.8)	60 (50.0)	47 (39.2)	0.108
	5-6	22 (16.2)	52 (38.2)	62 (45.6)	
	7-8	2 (6.9)	16 (55.2)	11 (37.9)	
	>9	2 (11.8)	12 (70.6)	3 (17.6)	
Type of family	Nuclear	23 (12.9)	82 (46.0)	73 (41.0)	0.390
	Joint	2 (5.3)	22 (57.9)	14 (36.8)	
	3 Generation	14 (16.3)	36 (41.9)	36 (41.9)	

Discussion

Anemia is a known public health problem both in developing and the developed countries mainly affecting the adolescents girls and women of reproductive age group. Prevalence of anemia among adolescents girls ranged from 50-70% with varying severity in different regions of the country. The prevalence of anemia in our study was 87.1% (mild anemia- 46.4% and moderate anemia- 40.7%). None of the study subjects had severe anemia (Hb<7gm).

In a study done by Hanagi C et. al. on nutritional status of rural adolescent girls in Dharwad district, the prevalence of anemia among their study subjects was found to be 72.0%. For diagnosis of anemia by cyanmethhemoglobin method was used in this study [9]. Similar results were seen in study which was conducted in rural Wardha showed the prevalence of severe, moderate and mild anaemia to be 0.6%, 20.8% and 38.4% respectively and a study which was conducted among school going girls in Ahmedabad revealed that 55.2% were mildly anaemic, 44.9% were moderately anaemic and that 0.6% were severely anaemic [10,11].

Among the different causes and types of anemia, nutritional anemia and iron deficiency is most common among Indian adolescent girls. Most of the studies have shown significant association between haemoglobin status and socio demographic characteristics of study subjects especially education status and socio economic status. Similar observations were seen in our study, but there was no association seen between type of family, education status of parents and birth order [12,13,14].

To combat high burden of anemia and malnutrition various programs like ICDS, weekly iron folic acid supplementation, public distribution system etc have been started by Government of India still the burden of anemia continues to be high. It could be due the lack of utilisation of the services provided by the government, lack of awareness or due to associated infections. Improving the knowledge of women of reproductive age and incorporating a portion about importance of nutrition in the school curriculum may improve the nutritional status and the haemoglobin status of the adolescents.

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