ORIGINAL ARTICLE
pISSN 0976 3325 | eISSN 2229 6816
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www.njcmindia.org

EPIDEMIOLOGICAL PROFILE OF ANAEMIA AMONG RURAL SCHOOL GOING ADOLESCENTS OF DISTRICT BAREILLY, INDIA

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Financial Support: None declared
Conflict of interest: None declared

How to cite this article:
Agarwal AK, Joshi HS, Mahmood SE, Singh A, Sharma M. Epidemiological Profile of Anaemia among Rural School Going Adolescents of District Bareilly, India. Ntl J of Community Med 2015; 6(4):504-507.

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Date of Submission: 25-08-15
Date of Acceptance: 17-12-15
Date of Publication: 31-12-15

ABSTRACT

Background: WHO estimates that India has highest prevalence of anaemia among the South East Asian Countries. During adolescence anaemia is more prevalent due to growth spurt.

Objectives: To find out the prevalence of anaemia among rural school going adolescents and to identify the associated factors.

Material and Methods: One year cross sectional study was conducted in western Uttar Pradesh among 900 school going adolescents using multistage sampling. A structured schedule was used to collect the information. Chi-square test was applied to analyse data using SPSS software.

Results: The overall prevalence of anaemia was 58.67%. Prevalence of anaemia was significantly higher among the females (65.11%). Higher prevalence of anaemia was found among adolescents aged between 10-14 years (59.58%), Hindus (62.04%), middle socio-economic class (78.89%) and joint families (59.63%). Higher prevalence was also found among those adolescents whose mothers and fathers were educated upto primary level (58.87% and 60.83% respectively).

Conclusion: High prevalence of anaemia was found, especially among the female adolescents. Adequate food consumption and regular intake of iron and vitamin C rich foods during early childhood period, de-worming, food fortification, supplementary feeding and nutrition education of parents can prevent nutritional anaemia in adolescents.

Key words: Anaemia, adolescents, females, rural

INTRODUCTION

About 20.5% of population of India consists of adolescents, comprising one-fifth of the total population of the country. [1, 2] Adolescence (age 10-19 years) is a period of transition from childhood to adulthood. It is characterized by rapid physical, biological and hormonal changes resulting in to psychosocial, behavioural and sexual maturation between the ages of 10-19 years in an individual. [3] Adolescents are at high risk of iron deficiency and anaemia due to accelerated increase in requirements for iron, poor dietary intake of iron, high rate of infection and worm infestation as well as the social norm of early marriage and adolescent preg-

nancy. The primary cause of iron deficiency and iron deficiency anaemia (IDA) is attributed to lack of bioavailable iron from the traditional cereal-based diets and low consumption of foods rich in heme iron.

The importance of anaemia among adolescents as a major public health problem is widely recognized. The National Survey data from India has reported 56% prevalence of anaemia among adolescent girls. [4] Recent reports reveal that anaemia prevalence in adolescent girls is very high ranging from 50 % to >90%. [5]

The data regarding prevalence of anaemia among the rural adolescents was scarce therefore this study was undertaken to find out the prevalence of anaemia among rural school going adolescents of District Bareilly, Uttar Pradesh, India and to identify the associated factors.

MATERIALS & METHODS

A cross sectional study of one year duration from January 2012 to December 2012 was conducted in the rural field practicing area of Department of Community Medicine, Rohilkhand Medical College and Hospital, District Bareilly. Ethical committee approval was taken before the start of the study and informed consent was obtained from the principals of the schools. Multistage sampling design was used. In first stage one block (Bithrichainpur) was randomly selected than in selected block out of 8 schools 5 schools were selected by lottery method, optimum number of adolescents studying in class 6th to 12th were selected randomly, ensuring the representation of all classes. Thus the desired minimum sample size of 900 was achieved. Sample size was calculated on the basis by formula $n=4PQ/L^2$, where P is 33% (prior prevalence rate[6]), Q=100-P=100-33=67, l=10% of P which came out to be 812. 10% non-response rate was added. Thus sample size came to be 893.2 which were rounded up to 900.

The information was collected on socio-demographic characteristics, like age, sex, religion, type of family, socio economic status (Modified Prasad classification)[7], parental education etc. Anaemia was diagnosed on the basis of pallor of conjunctiva. Data were analyzed with SPSS 17.0. Chi-square test was applied to analyse data.

RESULTS

The prevalence of anaemia was higher in adolescents in age group 10-14 years (59.58%) as compare to 15-19 years age group (57.06%). It was significantly higher among females (65.11%) as compare to males (54.67%), (p=0.002). The prevalence of anaemia was found to be higher among Muslims (62.04%), adolescents belonging to socio-economic class III (78.89%) and those belonging to joint families (59.63%). Religion, socio-economic class and type of family had no statistically significant relation with anaemia (p<0.05). (Table 1)

Among 528 anaemic adolescents, mothers of 82.95% and fathers of 46.78% were educated less than or equal to primary level. Association between anaemia and parental education was found statistically insignificant (p>0.05). (Table 2)

Table 1: Distribution of adolescents according to anaemia in relation to socio-demographic profile

Socio demography	Anaemic (n=372) (%)	Non Anaemic (n=528) (%)	Total (n=900) (%)	χ2 (P-value)
Age group (years)				
10-14	232 (40.42)	342 (59.58)	574 (63.77)	0.547, (0.459)
15-19	140 (42.94)	186 (57.06)	326 (36.22%)	
Gender				
Male	252 (45.33)	304 (54.67)	556 (61.78)	9.552, (0.002)
Female	120 (34.89)	224 (65.11)	344 (38.22)	
Religion				
Hindus	268 (42.82)	358 (57.18)	626 (69.56)	1.853, (0.173)
Muslims	104 (37.96)	170 (62.04)	274 (30.44)	
Socio-economic class				
II	3 (37.50)	5 (62.50)	8 (0.89)	4.855, (0.183)
III	6 (25.00)	18 (75.00)	24 (2.67)	
IV	58 (36.71)	100 (63.29)	158 (17.56)	
V	305 (42.96%)	405 (57.04)	710 (78.89)	
Type of family				
Nuclear	129 (43.29)	169 (56.71)	298 (33.11)	0.702, (0.402)
Joint	243 (40.37)	359 (59.63)	602 (66.89)	

Table 2: Distribution of adolescents according to anaemia in relation to parent's education

Characteristics	Anaemic (n=372) (%)	Non Anaemic (n=528) (%)	Total (n=900) (%)	χ2 (P-value)
Mother's education				
Primary or below	306 (41.13)	438 (58.87)	744 (82.67)	0.074 (0.786)
Above primary school	66 (42.31)	90 (57.69)	156 (17.33)	
Father's education				
Primary or below	159 (39.17)	247 (60.83)	406 (45.11)	1.437 (0.231)
Above primary school	213 (43.12)	281 (56.88)	494 (54.89)	

DISCUSSION

In the present study anaemia was found in 59.58% adolescents. The prevalence of anaemia reported among rural female adolescents in some recent studies is between 40-43%. [8-12] In our study Prevalence of anaemia in females (65.11%) was significantly higher than males (54.67%) (p= 0.002). Similar finding has been observed by Mane et al. [13] in 2012 in their study where prevalence among girls was (51%) significantly higher as compared to boys (13%). In present study anaemia was observed more in Hindus (67.8%) as compare to Muslims (32.2%) in this study, this may be due to the fact that majority of adolescents were Hindus. Most of the anaemic adolescents were of socioeconomic class V (78.89) followed by class IV (18.94%), 3.41% adolescent were from socioeconomic class III and only 0.95% were from class II. But association between socioeconomic status of adolescents and anaemia was not significant. Majority of anaemic adolescents were from joint families (67.99%) as compare to nuclear families (32.01%). Similar findings were observed by Rawat et al. [14] (2001), in their study done on rural adolescent girls of Meerut, the prevalence of anaemia observed by them in adolescent girls was 34.5% and it was highest in socioeconomic class V (50%), 45.2% anaemic adolescent were from joint families as compare to 28.3% from nuclear families . The prevalence of anaemia was also reported to be higher among girls as compared to boys by other authors [15-17.] The findings of Srinivasan et al. [18], were different than present study as they found higher prevalence of anaemia in both boys (80.4%) and girls (72%). In the current study, the prevalence of anaemia was higher in adolescents in age group 10-14 years (59.58%) as compared to 15-19 years age group (57.06%). On the contrary, Biradar et al.[1] (2012), observed higher prevalence of anaemia in 15-19 years age group girls as compare to girls in age group 10-14 years. Anand K et al. (1999) [19] also found prevalence of anaemia was higher in older boys as compared to younger ones, these findings were also different than those of present study. Our study reveals higher prevalence of anaemia among adolescents whose mothers were educated less than or up to primary level (58.67%). A significant association was reported between the adolescent girl's haemoglobin concentration and her mother's educational status by Rajaratnam et al and Pattnaik et al [20-21].

Our study limitation is we did not do any laboratory investigation to diagnose anemia. As our study was conducted among rural adolescents it was difficult for us to include laboratory investigation. However a further study using laboratory investigation should be conducted for better reliability of results.

CONCLUSION

Higher prevalence of anaemia among adolescents was observed in present study. The prevalence of anaemia was higher among females as compared to males. Anaemia has important implication in terms of physical work capacity and adverse reproduction outcome. Ensuring adequate food consumption and regular intake of iron rich and vitamin C rich foods , de-worming periodically, food fortification, supplementary feeding and nutrition education of parents are some of the strategies that can prevent nutritional anaemia in adolescents. Association of anaemia with socio-economic status and parents education stresses the need to develop strategies for intensive adult education, nutrition education and dietary supplementation including anaemia prophylaxis.

School based mid day meal programme and iron supplementation should receive priority in rural areas. A beginning has been made by inclusion of adolescent girls as beneficiaries of iron tablets (once a week) under the Integrated Child Development Services (ICDS) scheme. A periodical and regular health check-up (including anthropometry) with concerted efforts towards their nutrition along with focused health education will improve the health and nutritional status of these school going adolescents. The school health services might provide an ideal platform to detect the health problems early and treat them. Early detection of the morbidities through regular survey helps in prompt treatment and prevention of serious health complications.

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