

Original Research Article

Assessment of Anemia status among school going adolescent of Raipur and Jashpur district of Chhattisgarh

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ABSTRACT

Background: According to WHO, adolescence is the population of 10-19 years of age. According to NFHS III, in Chhattisgarh, 58.7% adolescent girls and 34.6% adolescent boys aged between 15-19 years were anemic. So, to combat anemia MoHFW launched weekly iron and folic acid supplementation (WIFS) programme with the objectives to reduce the prevalence. Thus the present study was in attempts with the objective to assess anemia status among school going adolescent of Raipur and Jashpur districts of Chhattisgarh.

Methods: It was a school based cross-sectional study conducted in the two districts of Chhattisgarh during 2017-18 among the students aged between 12-19 years and the sample size was 480. By using simple random sampling method, four schools from each district and from each school total 60 students i.e. 10 students from each class 7th - 12th were selected by using systematic random sampling method. Permission from DEO of the respective district followed by permission from the principal of each schools and consent from parents of the student was taken and then study was proceeded.

Results: In the present study, the mean age of the students in Raipur and Jashpur district was 15.1 ± 1.8 years and 15.2 ± 1.8 years respectively. Out of all the students, in Raipur district, 101 (42.1%) students were found to be anemic and mean Hemoglobin level was 12.5 ± 1.9 gm/dl. In Jashpur district about two third 147 (61.2%) of the students were anemic and mean Hemoglobin level was 11.9 ± 1.9 gm/dl.

Conclusions: This study concluded that anemia is still high among adolescent boys and girls.

Keywords: Anemia, Adolescents, WIFS programme

INTRODUCTION

Anemia is one of the most important global public health problem, affecting both developing and developed countries.¹

It is generally assumed that iron deficiency is the one of the major cause of anemia. The low iron content of a typical Indian diet, along with the high prevalence of worm infestation, is the cause of the high prevalence of anemia in India.^{1,2}

Iron deficiency anemia as a major preventable public health problem, mostly affecting the pregnant women, young children and adolescents, particularly girls, especially during menarche.³

According to World Health Organization (WHO), adolescence is the population of 10 to 19 years of age.⁴ It is the period of life spanning and transition from childhood to adulthood.^{2,5} It is a period of rapid growth with increased iron requirement. Therefore, Iron deficiency anemia in adolescent can result in impaired

physical growth, poor cognitive development, reduced physical fitness and work performance and lower concentration on their daily tasks.

According to National Family Health Survey- III (NFHS III), in India over 55% adolescent girls aged between 15 to 19 years and 30% adolescent boys aged between 15 to 19 years were anemic and in Chhattisgarh, 58.7% adolescent girls aged between 15 to 19 years and 34.6% adolescent boys aged between 15 to 19 years were anemic.⁶

So, to combat iron deficiency anemia in India especially among adolescents in the year 2013, the Ministry of Health and Family Welfare (MoHFW), Government of India (GoI), has launched Weekly Iron and Folic Acid Supplementation (WIFS) Programme with the objectives to reduce the prevalence and severity of nutritional anemia in adolescent population between the age of 10 to 19 years age group.⁷ In Chhattisgarh, WIFS programme is running in all the government, government aided and municipal schools since 1st July 2013.

In spite of implementation of the WIFS programme, in India anemia among adolescent girls aged between 15 to 19 years is 54.0% while in boys aged between 15 to 19 years is 29.2. In Chhattisgarh anemia among adolescent girls and boys aged between 15 to 19 years is 45.5% and 27.4% respectively as per NFHS IV.⁸

Very few studies have been done in the area of adolescent anemia especially among both sexes. Thus the present study was in attempts with the objective to assess anemia status among school going adolescent of Raipur and Jashpur districts of Chhattisgarh.

METHODS

It was a School based Cross-sectional study conducted in the selected government schools of two districts of Chhattisgarh during 2017-18 academic year among the students aged between 12 to 19 years. By considering the compliance of IFA tablets 67.7% among school adolescents under WIFS programme, alpha (α) 0.05, and margin of error of 5%, the sample size was 336.² Considering 20% non-response rate, sample size was 420 and the final sample size was rounded off to 480 for equal distribution of boys and girls. By using simple random sampling method, four schools from each district were selected and from each school total 60 students i.e. 10 students (5 boys and 5 girls) from each class 7th to 12th were selected by using systematic random sampling method.

The ethical clearance from the Institutional Ethics Committee, Pt. J. N. M. Medical College, Raipur was taken. Then, list of Government schools of each district was obtained and permission regarding study in the selected schools were taken from respective District Education Officer (DEO) from each district. After

reaching the school, permission taken from the principals for conducting the study in their school and sampling of students was proceeded. Meanwhile with the help of school principals, parent/guardian of selected students were called and briefed about the study and its purpose and then written consent form, which is developed by the World Health Organization (WHO) for participation of minor was adapted to study and local situation was distributed to them prior to the day of survey. Then filled consent form was collected from their children and those given consent were included in the study.

In addition, with the help of School Nodal Teachers all study participants were briefed about the study purpose and procedures required for the study was explained to them in local language and selected students from 7th to 12th standard in the eight sampled schools, were interviewed and hemoglobin estimation was done using Hemocue 201+ system. According to Anemia Mukat Bharat criteria for anemia based on hemoglobin level for girls aged between 12 to 19 years was <12.0 gm/dl while in boys <12.0 gm/dl for aged between 12 to 14 years and <13.0 gm/dl for boys aged ≥ 15 years.

Statistical analysis

Data collected was entered and compiled in Microsoft excel 2007. After checking its completeness and correctness data were analyzed using SPSS software version 17.0. Results on continuous measurements were presented on Mean \pm SD and Categorical variables were interpreted using frequencies and percentages.

RESULTS

In the present study, the mean age of the students in Raipur district was 15.1 \pm 1.8 years and in Jashpur district it was 15.2 \pm 1.8 years. Most of the students (57.9%) in Raipur district were belonging to 15 to 19 years of age groups and 42.1% students were belonging to 10 to 14 years of age groups. Similarly, in Jashpur district 60% students were belonging to 15 to 19 years of age groups and 40% students were belonging to 10 to 14 years of age groups.

Furthermore, in Raipur district 75% students were belonged to rural area while in Jashpur district 100% students were belonged to rural area.

Out of 240 students in Raipur district, 99.6% students were Hindu, 0.4% were Christian and in Jashpur district 82% students were Hindu, 11.7% were Christian 6.3% belonged to Muslim by religion.

With respect to category wise distribution, in Raipur district 72.9% of students were belonging to OBC category followed by Scheduled caste (20.8%), Scheduled tribe (4.6%) and unreserved (1.7%) while in Jashpur district 55.4% of students were belonging to

OBC category followed by Scheduled tribe (35%), Scheduled caste (6.3%) and unreserved (3.3%)

Likewise, 80.8% students in Raipur district and 93.3% students in Jashpur district reported their food preference as mixed diet (Table 1).

Out of all the students, in Raipur district, 101(42.1%) students were found to be anemic and mean hemoglobin level was found to be 12.5 ± 1.9 gm/dl. In Jashpur District about two third 147 (61.2%) of the students were anemic and mean Hemoglobin level was found to be 11.9 ± 1.9 gm/dl (Table 2).

Table 1: Distribution of Students according to their socio demographic characteristics.

Variables	Raipur district (n=240)		Jashpur district (n=240)		Total (n=480)	
	No.	%	No.	%	No.	%
Age group (in years)						
Early adolescents (10-14)	101	42.1	96	40	197	41
Late adolescents (15-19)	139	57.9	144	60	283	59
Place of residence						
Urban	60	25	0	0	60	12.5
Rural	180	75	240	100	420	87.5
Religion						
Hindu	239	99.6	197	82	436	90.9
Muslim	0	0	15	6.3	15	3.1
Christian	1	0.4	28	11.7	29	6
Category						
Non-tribal	229	95.4	156	65	385	80.2
Tribal	11	4.6	84	35	95	19.8
Food preference						
Vegetarian diet	46	19.2	16	6.7	62	12.9
Mixed diet	194	80.8	224	93.3	418	87.1

Table 2: District wise distribution of anemia status among students.

Variable	Raipur district (n=240)		Jashpur district (n=240)		Total (n=480)	
	No.	%	No.	%	No.	%
Anemia						
Non-anemic	139	57.9	93	38.8	232	48.3
Anemic	101	42.1	147	61.2	248	51.7

Raipur: Mean Hb= 12.47 ± 1.90 gm/dl, Jashpur: Mean Hb= 11.92 ± 1.87 gm/dl.

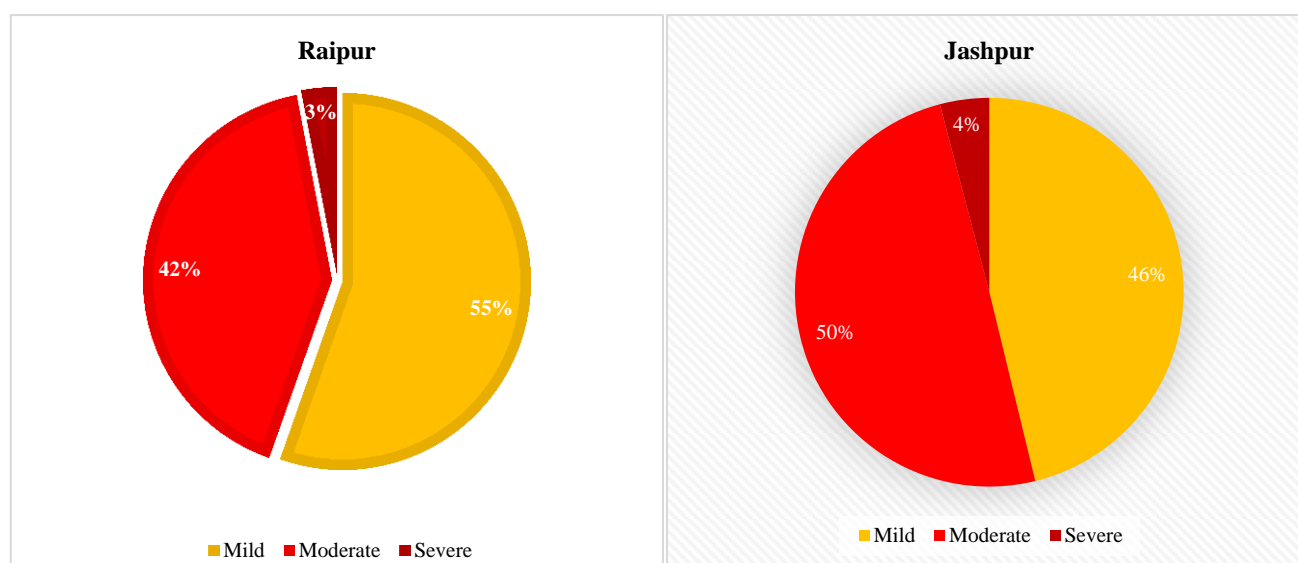


Figure 1: District wise distribution of anemic students according to degree of anemia.

It was seen that among the anemic students (n=101), in Raipur district, 55.4% and 41.6% were mild and moderate anemic, respectively and very few (3%) students had severe anemia where as in Jashpur district among the anemic students (n=147), 46.2% had mild anemia, 49.7% were moderate anemic and 4.1% students had severe anemia. So in Raipur district, mild anemic among students was found to be more however, in Jashpur district, moderate anemic among students was found to be more (Figure 1).

DISCUSSION

In our study, the mean age of the students in Raipur district was 15.1 ± 1.8 years and in Jashpur district it was 15.2 ± 1.8 years. The finding regarding mean age is in agreement with study done by Sarada et al in that mean age of the students was 14.5 ± 1.8 years but contradicts the studies done by Dhikale et al where the mean age of boys was 13.07 ± 1.42 years and for girls, 13.51 ± 1.81 and study by Sajna et al showed in their study that mean age of the population was 13.01 ± 1.3 years.⁹⁻¹¹

In the present study, most of the students were belonging to Hindu in both the district. On the contrary study done by Chauhan et al in Delhi showed that most of the participants were Muslims.¹²

Out of all the students, in Raipur district, 101(42.1%) students were found to be anemic and mean Hb level was found to be 12.5 ± 1.9 gm/dl. In Jashpur district about two third 147 (61.2%) of the students were anemic and mean Hemoglobin level was found to be 11.9 ± 1.9 gm/dl. (Table 2) In a study done by Chauhan et al in Delhi among 10 to 19 years females found that 71.7% subjects were found to be anemic with mean Hemoglobin level was found to be 10.6 ± 1.7 gm/dl.¹² Study done by Divakar at Bengaluru done their study among adolescent girls aged 11 to 18 years old showed that most of the adolescent girls 19.8% had mild anemia.¹³ Study done by Rakesh in school children from class V to IX in Kollam district showed that mean Hb level was 12.4 ± 1.26 gm/dl.¹⁴

In current study, in Raipur district, mild anemia among students was found to be more among the adolescent students and in Jashpur district, moderate anemia among adolescent students was found to be more. In a study done by Chauhan et al in Delhi among 10 to 19 years females found that moderate anemia was found to be more.¹²

According to NFHS IV, In India, anemia among adolescent girls aged between 15 to 19 years is 54% while in boys aged between 15 to 19 years is 29.2. Similarly, in Chhattisgarh, anemia among girls aged between 15 to 19 years and boys aged between 15 to 19 years is 45.5% and 27.4% respectively.⁸

Present study showed that anemia among late adolescent girls (35.1%) in school is less in proportion than prevalence of anemia in India (54%) and Chhattisgarh (45.5%). Similarly, anemia among late adolescent boys (24.6%) in school is less in proportion than prevalence of anemia in India (29.2%) and Chhattisgarh (27.4%) according to NFHS 4 (Figure 2 and 3).

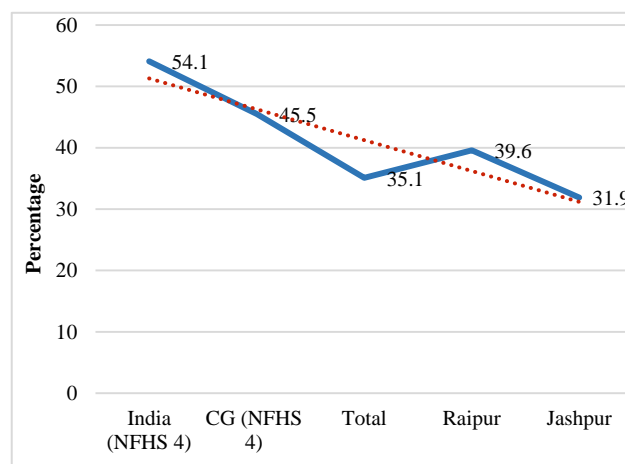


Figure 2: Proportion of late adolescent anemic girls aged between 15-19 years.

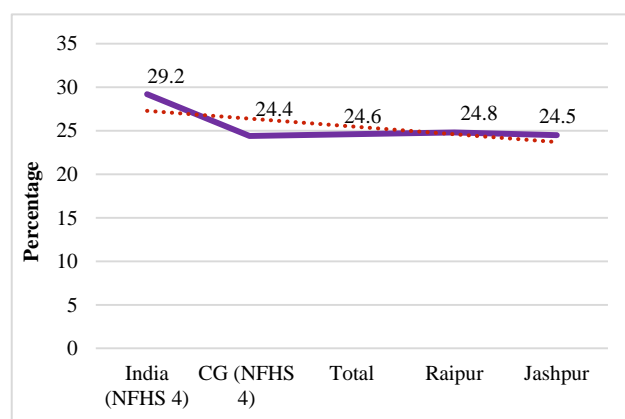


Figure 3: Proportion of late adolescent anemic boys aged between 15-19 years.

However late adolescent girls in Raipur district were more (39.6%) anemic as compare to Jashpur district (31.9%) and the finding in Raipur district is in contrast with district fact sheet of Raipur district (NFHS 4) in which prevalence of anemia for non-pregnant women between 15 to 49 was 50.9% while in Jashpur district it is accordance with the findings of district fact sheet of Jashpur district (NFHS 4) in which prevalence of anemia for non-pregnant women between 15 to 49 years was 35.2% (Figure 2).⁸

Similarly, prevalence of anemia in late adolescent boys is almost equal in proportion for Raipur district (24.8%) and Jashpur district (24.5%). These findings are in agreement with district fact sheet of Raipur district (NFHS 4) where

prevalence of anemia among men age 15 to 49 years is 22.2% where as in disagreement with district fact sheet of Jashpur district (NFHS 4) where it is 17.9% (Figure 3).⁸

CONCLUSION

It is concluded from the present study that anemia is still high among both adolescent boys and girls, in addition, less proportion of late adolescent students were found anemic as compared with NFHS-4 data of India and Chhattisgarh. Hence, WIFS programme can be proved as an efficient way to address anemia among adolescents.

Recommendations

There is need to strengthen the WIFS programme to combat anemia among adolescents.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institute Scientific and Ethical Committee Pt. J.N.M. Medical College, Raipur, Chhattisgarh

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