SHORT ARTICLE

Prevalence of anaemia among women of reproductive age group in a rural block of Northern India

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Abstract	Introduction	Methodology	Results	Conclusion	References	Citation	Tables / Figures

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Abstract

Background: Nutritional anaemia is a major public health problem in India and is primarily due to iron deficiency. The National Family Health Survey-3 (NFHS-3) data suggests that anaemia is widely prevalent among all age groups, and is particularly high nearly 55.3% amongst the most vulnerable in all women (15-49 years) **Aims & Objectives:** 1. To determine prevalence of Anaemia among women of reproductive age group in rural block of Haryana. 2. Effects of anaemia on mean height and weight of women of reproductive age group. **Material Methods:** Cross-sectional, descriptive. All the women of reproductive age group (15-45 years) of CHC Sample block were included as study participants. **Results:** The overall prevalence of anaemia was 48.9%. 4302 out of 8590 females had varying severity of anaemia while anaemia was absent in 51.1% of the study participants. Out of the 8590 females, 1612 (18.8%) were mildly anaemic, 2374 (27.6%) were moderately anaemic and 217 (2.5%) were severely anaemic. The study revealed that mean weight and mean height in non anaemic females was more than that of varying degree (severe, moderate, mild) of anaemic females. **Conclusion:** the present study revealed anaemia to be a major health problem among the women of reproductive age group in rural areas in Haryana affecting their health status.

Key Words

Prevalence; Women of reproductive age; anaemia

Introduction

The WHO Global Database on Anaemia for 1993–2005, covering almost half the world's population, estimated the prevalence of anaemia worldwide at 25 per cent (1). Although the prevalence of anaemia is estimated at 9 per cent in countries with high development, in countries with low development the prevalence is 43 per cent. Women of reproductive age are most at risk, with global anaemia prevalence estimates of 42 per cent in pregnant women, and 30 per cent in non-pregnant women aged 15–49 years (2).

Indian scenario: India is one of the countries with very high prevalence of anaemia in the world. Nutritional anaemia is a major public health problem in India and is primarily due to iron deficiency. The National Family Health Survey-3 (NFHS-3) data suggests that anaemia is widely prevalent among all age groups, and is particularly high nearly 55.3% amongst the most vulnerable in all women (15-49 years) (3).

Impact of anaemia on health outcomes: Anaemia has major consequences on human health as well as social and economic development. Anaemia is the world's second leading cause of disability and is responsible for about more than 115,000 maternal deaths and 591,000 perinatal deaths globally per year, of which three-quarters occur in Africa and South-east Asia(4).

Aims & Objectives

1. To determine prevalence of Anaemia among women of reproductive age group in rural block of Haryana. 2. Effects of anaemia on mean height and weight of women of reproductive age group.

Material and Methods

The present study is descriptive type of community based study with cross-sectional design, Study period: January 2014 to March 2014

Methodology: The study was conducted in Sampla Block which is located in the southeastern part of the District Rohtak having population of 122686 (2011 census). The study was done among all the females of age group 15-45 years in Sampla block. A total of 18402 women of 15-45 years age group were registered from ASHAs eligible couple survey register done in November 2013. Village wise roster was prepared and information regarding this aspect was already given through ASHA workers/ANMs by distributing pamphlets. Prior information was given to PRI members, school teachers of that village. ASHA workers helped in social mobilization during the day of activity. After Hemoglobin estimation; nutritional advice was given and IFA tablets were distributed to the anaemic females.

Source of the Data: Inclusion criteria: All the females of the age group 15-45 years in the study area. Exclusion criteria: females after calling/ contacting three times did not report for examination on the designated day and not given consent for Hb estimation. Females found to be pregnant during study period were excluded from the study due to different cut off value of haemoglobin for detecting anaemia among pregnant females. Selection of the participants: The participants were informed about the study and informed consent was obtained. A pre-designed and pre-tested proforma was used to collect the information about the participants. A brief, relevant clinical examination was also done of the study participants. Data collection: Test Principle (Blood test for anaemia): The International Committee for Standardization in Hematology (ICSH) recommends the cyanmethoglobin (CMG) method as a standard method for estimation of Hemoglobin. This method is simple, rapid and reliable and measures all types of hemoglobin except sulfhemoglobin (5). The cyanmethoglobin standard complies with the specification defined by ICHS which is based on molecular weight of Hb (64,458 daltons) and a millimolar extinction coefficient of 44. Cyanmethoglobin Standard is used for direct comparison with blood. Drabkin's solution on mixing with whole blood converts Hemoglobin to Cyanmethoglobin is proportional to the Hemoglobin concentration (6, 7).

Collection of the blood samples: 0.02ml of capillary blood was drawn by puncture in micropipette under aseptic precautions and collected in dry test tube containing Drabkin's solution (5.0 ml). The collected blood sample was mixed well and kept for 5 minutes and analyzed by expert laboratory technicians. Analysis of the blood samples: The samples were analyzed by using photoelectric colorimeter (Digital).Haemoglobin levels to diagnose anaemia (g/dl): For non-pregnant women (15 years of age and above) more than and equal to 12 gm/dl taken as no anaemia, 11-11.9 gm/dl as mild anaemia while 8-10.9 gm/dl moderate anaemia and less than 8 gm/dl as severe anaemia (1). Data analysis: Codes prepared for the options of the proforma. The master chart prepared by using the EXCEL 2010 software and SPSS version 17.0 used for the analysis of the data with appropriate statistical tests

Results

The present cross-sectional study was conducted in Sampla block of Dist. Rohtak. A total of 18402 females of age group 15-45 years registered from eligible couple survey register done by ASHA workers in November 2013 were enrolled as study participants. 9033 females after calling/ contacting three times did not report for examination on the designated day. Out of the remaining 9369 women, 9270 had given consent for Haemoglobin estimation hence the overall response rate was 50.37 %. Out of total 9270 females, 8590 females (non-pregnant) of reproductive age group (15-45 years) were analyzed for this research paper. (680 pregnant females excluded as per exclusion criteria).

Socio-demographic profile of study participants is mentioned in (Table-1).

The present study revealed that overall prevalence of anaemia was found to be 48.9% **(Figure- 1, 2).**

The present study explored that association of Anemia in relation to age of study participants was found to be statistically significant (p value <0.05) (Table- 2).

The present study demonstrated that association of Anemia in relation to caste of study participants was found to be statistically non-significant (p value >0.05) (Table- 3). Table– 4 depicts that mean weight for severely anaemic females was 48.525 ± 9.361, for moderate anaemic 51.349 ± 11.090, for mild anaemic 52.651 ± 11.001 while for non anaemic study participants mean weight was 53.147 ± 11.315. One factor ANOVA having F value 22.485 accepted the Null hypothesis meaning thereby mean weight in non anaemic women of reproductive age group was more than that of varying degree (severe, moderate, mild) of anaemic females. A statistical significant difference in mean weight was found between two groups even at <1% level of significance. On the other hand mean height for severely anaemic females was 153.21 ± 6.857, for moderate anaemic 154.5 ± 6.577, for mild anaemic 154.6 ± 6.194 while for non anaemic females mean height was 154.8 ± 6.166. One factor ANOVA having F value 4.956 accepted the Null hypothesis meaning thereby mean height in non anaemic females was more than that of varying degree (severe, moderate, mild) of anaemic females. A statistical significant difference in mean height was found between two groups even at <1% level of significance.

Discussion

Anaemia has major consequences on human health as well as social and economic development. National Nutritional Anaemia Control Programme (NACP) was launched in the country in 1970 to tackle the problem of anaemia but failed to make any impact (8).

In the present study, it was found that out of 8590 women of reproductive age group, 4203 (48.9%) were suffering from varying degrees of anaemia and that 4387 (51.1%) were non-anaemic. This indicated that it was a public health problem of high magnitude as per the WHO guidelines (1).

In a multi-country study on the nutritional status of adolescents, which was carried out by the International Centre for Research on Women (ICRW), anaemia was found to be the widest spread nutritional problem and its prevalence ranged from 32-55% (9). In our study prevalence of anaemia among 15-19 years age was found to be 46.8% while among 20-24 years and 25-29 years age group it was 55.7% and 52.7% respectively. A study conducted by Verma R et al (2013) recorded that overall prevalence of anemia among youths (15-24 years) under rural settings was 43.76% (10).

Various studies conducted in India and other developing countries have shown a high prevalence of anemia in women of reproductive age group. i.e. between 35 to 88% (11, 12, 13, and 14). Thus, the results of various studies which have been mentioned above, demonstrated that the prevalence of anaemia in this study was high as in other parts of the country.

This indicated the importance of including adolescents and child bearing age in the risk group to improve their iron status and the need for planning intervention programs that would increase the haemoglobin levels among women of this age group through prophylaxis treatment, dietary modification and helminth control.

In our study, the prevalence of severe anaemia was 2.5%, moderate anaemia was 27.6% and that of mild anaemia was 18.8%.

In a study carried out among youths in a rural block of Haryana by Verma R et al recorded that 44.38% females were mildly anaemic, 13.9% were moderately anaemic and 2.67% were severely anaemic (15). Bulliyy et al. found 96.5% prevalence among non-school going adolescent girls in three districts of Orissa, of which, 45.2%, 46.9%, and 4.4% had mild, moderate, and severe anemia (16). The high prevalence of mild and moderate anaemia demands due emphasis on iron and folic acid supplementation and health education on the consumption of iron rich foods, so as to bring down the total prevalence of anaemia among women of reproductive age group.

Conclusion

The present study revealed that anaemia to be a major public health problem among the Women of reproductive age group of rural settings. In the present study, we found that mean weight and mean height in non anaemic females was more than that of varying degree (severe, moderate, mild) of anaemic females and found statistical significant difference. The study also added that anaemia was more prevalent in child bearing age.

Recommendation

There is need to include iron rich food in the diet of females. Grams, maize, Mustard leaf, powder milk and red meat has high iron component so at least once in a week it should be recommended to improve iron stores. Mustard leaf is affordable for all so easily and should be included twice or thrice in a week. Females are taking food twice a day, they can increase food intake thrice a day. Thrice in a day having food can help them to increase the iron content in their body. At the time of preparing vegetables females can use iron pot so that it will also increase iron mineral in the body.

IFA tablets is another thing, women should take IFA tablets after consulting the doctor or ANM of the village. Once the adolescent girls get married they should start taking IFA tablets before being pregnant because at the time of pregnancy there is need of more iron and nutrition food.

We can go for policy advocacy because government have special program of ICDS to give enhanced ration to adolescent girls and women of child bearing age.

Information Communication Technology (ICT) to create knowledge and awareness among people and basically to females on various health and hygiene issue. This program should have integrated approach to combat anaemia. Proper knowledge should be given on menstruation for better understanding the cause of anaemia.

New innovative and cost effective method should be developed for the fortification of common people food. This will help to increase the iron in the food for long term in a sustainable manner. Training program should be organized to make people aware about fortification of food as well as importance of iron for females

Limitation of the study

In this community based study we can further explore the factors responsible for anaemia.

Relevance of the study

The study gives the ground reality and exact picture that prevalence of anaemia is still very high and draw the attention of the policy makers to review the gaps in existing policies for correcting anaemia among women of reproductive age group to improve their health status

Authors Contribution

VR: design and manuscript writing, KM: Monitoring and supervision of the activity and advisor, DS: participated during study actively, AV: Review the article, KR: Coordinated the activity and necessary arrangements

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Tables

TABLE 1 DISTRIBUTION OF THE STUDY PARTICIPANTS BY SOCIO-DEMOGRAPHIC CHARACTERISTICS (N=8590

Attributes		No. of study participants N= 8590(%)
Age	15-19 years	2233 (26.0)
	20-24 years	1462 (17.0)
	25-29 years	1286 (15.0)
	30-34 years	942 (11.0)
	35-39 years	843 (9.8)
	40-45 years	1824 (21.2)
Caste	SC	1775 (20.6)
	OBC	1587 (18.5)
	General	5228 (60.9)
Education Status	Illiterate	1249 (14.5)
	Primary	2639 (30.8)
	High School	3002 (34.9)
	Senior Secondary and More	1700 (19.8)
Marital status	Married	6174 (71.9)
	Unmarried	2416 (28.1)

TABLE 2 ASSOCIATION OF ANEMIA IN RELATION TO AGE OF STUDY PARTICIPANTS (N=8590)

	Age of study participants (years) N (%)						Total N (%)
	15-19 yrs	20-24 yrs	25-29 yrs	30-34 yrs	35-39 yrs	40-45 yrs	15-45 yrs
No Anaemia	1188 (53.2)	648 (44.3)	608 (47.3)	491 (52.1)	437(51.8)	1015(55.6)	4387 (51.1)
Anaemia	1045 (46.8)	814 (55.7)	678 (52.7)	451(47.9)	406(48.2)	809 (44.4)	4203 (48.9)
Total	2233(100.0)	1462 (100.0)	1286(100.0)	942 (100.0)	843(100.0)	1824 (100.0)	8590 (100.0)

TABLE 3 ASSOCIATION OF ANEMIA IN RELATION TO CASTE OF STUDY PARTICIPANTS (N=8590)

	Caste of study participants			Total N (%)
	General category	Other Backward Class	SC/ST	
No Anaemia	2921 (65.6)	822 (18.7)	644 (14.7)	4387 (100.0)
Anaemia	2307 (54.9)	765 (18.2)	1131 (26.9)	4203 (100.0)
Total	5228 (60.9)	1587 (18.5)	1775 (20.6)	8590 (100.0)

TABLE 4 ASSOCIATION OF LEVEL OF ANAEMIA WITH WEIGHT AND HEIGHT OF STUDY PARTICIPANTS

			N	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Weight	No anaemia		4387	53.1479	11.315	52.81	53.48	30.00	103.40
	Mild Anaemia		1612	52.6510	11.001	52.11	53.18	31.70	93.90
	Moderate Anaemia		2374	51.3492	11.090	50.90	51.79	30.00	102.40
	Severe Anaemia		217	48.5256	9.361	47.26	49.78	32.20	97.00
	Total		8590	52.4408	11.191	52.20	52.67	30.00	103.40
Model		Fixed Effects			11.149	52.20	52.67		
		Random Effects				50.03	54.84		
Height	No anaemia		4387	154.8	6.166	154.64	155.00	136.00	184.00

	Mild Anaemia	1612	154.6	6.194	154.36	154.97	136.00	178.00
	Moderate Anaemia	2374	154.5	6.577	154.27	154.80	136.00	186.00
	Severe Anaemia	217	153.2	6.857	152.31	154.15	137.00	176.00
	Total	8590	154.6	6.310	154.54	154.81	136.00	186.00
Model	Fixed Effects			6.306	154.54	154.81		
	Random Effects				154.06	155.29		

Weight (kgs), height (Cms)

Figures

FIGURE 1 DISTRIBUTION OF STUDY PARTICIPANTS IN RELATION TO ANAEMIA

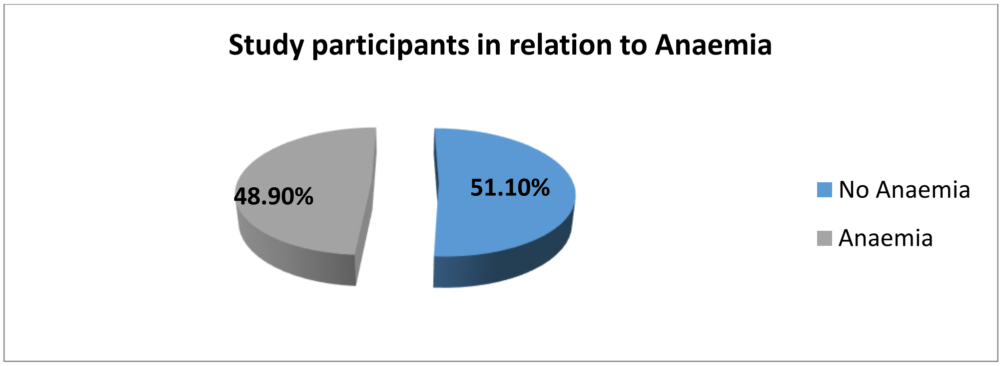

FIGURE 2 DISTRIBUTION OF STUDY PARTICIPANTS IN RELATION TO THE SEVERITY OF THE ANAEMIA