Original Research Article

Study of magnitude of anaemic problem in rural tertiary care centre in outpatient department

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ABSTRACT

Background: Prevalence of anaemia is very high in rural tertiary care hospital O.P.D patients. Anemia is the most common morbidity among micronutrients and affects health, education, economy, and productivity of the entire nation. Anemia, like fever, is a manifestation and not a disease per se. The most common group among the causes for anemia is malnutrition and among that group, iron deficiency makes up the bulk of it. Girls are more likely to be a victim due to various reasons. In a family with limited resources, the female child is more likely to be neglected. She is deprived of good food and education and is utilized as an extra working hand to carry out the household chores. The added burden of menstrual blood loss, normal or abnormal, precipitates the crises too often. Anemia can usually be prevented at a low cost, and the benefit/cost ratio of implementing preventive programs is recognized as one of the highest in the realm of public health. This information has equipped everyone in public health to take action against this long-standing problem and to do whatever is needed to be done.
Methods: In our study 200 people attending medical outpatient department at a tertiary care centre were enrolled. Assessment of the anaemic problem is worked out.
Results: Out of 200 patients, 107 were females and 93 were males. 49 females out of 107 had haemoglobin less than 10 and 9 males out of 93 are having haemoglobin less than 10. Among people with hemoglobin less than 10, 84.5% are females. Significant p value was observed in females (<0.0001).
Conclusions: Anemia continues to be a major health problem in developing countries like India, particularly rural India. Despite different strategies and programs have been taken by government of India the growing menace of anaemia is not solved. So newer strategies must be taken.

Keywords: Anemia, Females, Iron, India, Nutrition, Programmes

INTRODUCTION

According to WHO anaemia is the qualitative and or quantitative diminution of haemoglobin or RBC or both in respect to the age and sex of the individual anaemia is defined as a reduction of the total circulating red cell mass below normal limits.[1]

Anemia is a widespread public health problem associated with an increased risk of morbidity and mortality. It is a major problem in India spatially in pregnant women but young adult women between the ages 15 to 25 where who are non-pregnant are also especially vulnerable to anaemia. Though anaemia is less common among male but they also suffer from anaemia in a considerable extent to their counterpart in developed countries.

Iron is an important micronutrient which is essential for various functions in human body. It is essential for cellular growth and differentiation, oxygen binding, transport and storage, enzymatic reactions, immune function, cognitive function, mental and physical growth etc.[2]

Iron deficiency in women

Women tend to have substantially lower iron stores than men (one eighth of total body iron in women compared to one third in men), making them more vulnerable to iron deficiency when iron intake is lowered or need increases. Women of reproductive age lose iron during menses and have a substantially higher need for iron during pregnancy, because of the increase in red cell volume of the mother and placental and fetal growth. This substantially increases their risk of iron deficiency anemia. Women with severe anemia can experience difficulty meeting oxygen transport requirements near and at delivery, especially if significant hemorrhage occurs. This may be an underlying cause of maternal death and antenatal and perinatal infant loss.

Iron demand in adolescence

Adolescence is an important period of nutritional vulnerability due to the increased nutritional demands for growth and development during this phase. Iron requirement is high because of intense growth and muscle development, resulting in an increase in blood volume.[3]

Another important aspect that should be taken into consideration is current lifestyles, with the increasing dependence on food that can be prepared rapidly and simply. Fast food is potentially harmful, since there are often important nutritional limitations with this type of food, including its high energy, fat and sodium content in conjunction with its poor fiber, vitamin, calcium and iron content.[4] Deficiency of iron due to either physiological or pathological reason can affect mental and physical growth resulting in decreased learning capacity and work productivity. IDA is characterized by a defect in haemoglobin synthesis, resulting in hypochromic and microcytic red blood cells. Iron deficiency can result either due to less nutritional supply, increased demand or blood loss due to any reason.[5] These may be deficient intake or absorption of iron, increased demand during adolescence, heavy blood loss during menstruation, parasitic infestation etc.[6] More than half of the world's undernourished population lives in India.[7]

In India, a recent national survey showed that the daily dietary intake of iron was about 25mg among nonpregnant, nonlactating women.[8] This figure is more than 80% of the recommended dietary allowance (RDA) of 30mg of iron for Indian women.[9] This suggests that the cause of iron deficiency and anemia among Indian women may not be inadequate intake of iron. The poor bioavailability of nonheme iron present in local diets that

are largely plant-based, with rice, pulses, and vegetables that are high in phytic acid and fiber, could inhibit iron absorption and is likely to be an important factor in the development of anemia and iron deficiency.[10-12]

Deficiencies of other micronutrients, such as vitamin A and riboflavin, can also synergistically affect the process of erythropoiesis by their vital role in either the absorption or the utilization of iron or in the differentiation and maturation processes of red cells.[13-15] Despite of different programmes taken by the government for primary and primordial prevention of anaemia among vulnerable groups the prevalence is on the rise, so we want to focus on the prevalence so that newer innovative and effective methods can be taken against this growing menace.[16]

The aim of the present study was to assess the magnitude of anaemia in a rural tertiary care centre and find out the magnitude of anaemia in rural India at our place.

METHODS

This cross-sectional study was done in haematology departmental laboratory for a period of 3 months. All the patients were informed about the work and written informed consent was taken from each patient.

Inclusion criteria

- Males of age group 17-85,
- Females of age group 17-85.

Exclusion criteria

- Females of age below 17 years,
- Males of age below 17 years,
- Pregnant women,
- Chronic kidney disease, Chronic liver disease and known cases of various types of anaemia on treatment.

A total of 200 patients attending the medical outpatient department were taken as cases. All patients were categorized into two groups. One group comprised 107 females of age group 17-85 years and another group of 93 males of 17-85 years. Estimation of blood haemoglobin level was done. For estimation of blood haemoglobin, 1ml of venous blood was collected with all aseptic measures in vacutainer containing EDTA. After collection, blood was gently mixed with the anticoagulant. Haemoglobin estimation was done by Sahli's method.

Statistical analysis

Mean value and standard deviation of all the parameter were calculated using Graph Pad software. Significance of p value was below 0.005.

RESULTS

Out of total 200 people, 107(53.5%) constitutes females and 93 (46.5 %) constitutes males. Most of the females in our study are of age group 31-50 i.e., 45.8% which constitutes the productive age group of the nation and 23.4% of females (25) are above age 60 years. Males above 60 years are more in number i.e., 29 (31.2%) among which 11 are anemic. Present study shows 34.5% (69) of total population have hemoglobin 10 and less than 10gm and 65.5% (131) have more than 10gm of hemoglobin.

Table 1: Sex, age and hemoglobin distribution.

| Hb% 10 or <10 | Hb% >10 | Distribution | | | Hb% 10 or <10 | Hb% >10 |
		Males no.	Age	Females no.		
0	1	1	16 - 20	4	1	3
0	11	11	21 - 30	13	9	4
0	20	20	31 - 40	23	14	9
0	12	12	41 - 50	26	12	14
2	18	20	51 - 60	16	1	15
11	18	29	>60	25	19	8
13	80	93	200	107	56	51
		46.5%	%	53.5%		
6.5%		Hb% 10 or <10			28%	
	40%	Hb% >10				25.5%

In present study population of females, hemoglobin <10, 52.3% (56) out of 107 (p value <0.005). In present study population of females, hemoglobin >10, 47.6% (51) out of 107 (p value <0.005). In present study population of males, hemoglobin <10, 13.9% (13) out of 93.

Table 2: Severity of anemia in females and males.

| Hb value | Females | | Males | |
	No.	%	No.	%
<6	1	0.99	0	0
6.1-6.9	2	1.9	0	0
7.0-7.9	7	6.5	0	0
8.0-8.9	18	16.8	3	3.2
9.0-9.9	25	23.3	6	6.45
10	3	2.8	4	4.3
10.1-10.9	28	26.1	65	69.8
>11	23	21.4	15	16.1

In present study population of males, hemoglobin >10, 86.1% (80) out of 93. In present study, number of females with hemoglobin <7 (severe anemia) are 3 and there are no males. 53 females in present study are moderately anemic. i.e., hemoglobin between 7-10gm% and out of which 14 are in the age group of 31-40 and 19 are in the age >60.

There are no females in our study whose hemoglobin is above 13 gm% Within hemoglobin of 7-10 gm%, there are 13 males and with hemoglobin of 10-13gm% there are 65 males and with hemoglobin of 13-15gm% there are 15 males and no males above 15gm%.

Table 1 showed out of total 200 people, 107(53.5%) constitutes females and 93 (46.5 %) constitutes males. Out of 107 females, 26 belongs to 41-50, 25 belongs to >60, 23 belongs to 31-40 age groups. Among the age groups 12 of 26 (41-50), 19 of 25 (>60), 14 of 23 (31-40) showed the Hb% 10 or <10. Out of 93 males, 20 belongs to 51 – 60, 29 belongs to >60, 20 belongs to 31-40 age groups. Among the age groups 2 of 20 (51-60) and 11 of 29 (>60) showed the Hb% 10 or <10. The percentages of Hb% 10 or <10 are 25.5% in females and 6.5% in male population.

Table 2 showed the severity of anemia in females were 2.89% in 6-7gm, 6.5% in 7.0-7.9, 16.8% in 8.0-8.9, 26.1% in 9.0-10.0 and more than 10grams in 46.5% females. Among males 3.2% in 8.0-8.9, 10.75% in 9.0-10.0 and more than 10 grams in 85.9% males. Anemia severity of Hb% 10 or <10 were noticed in 53.5% females and 14.1% males.

Table 3: Hemoglobin comparison in female and male.

	Female	Male	Total	%
Hb% 10 or <10	56	13	69	34.5
Hb% >10	51	80	131	65.5
Total	107	93	200	

Table 3 showed the comparison of Hb% 10 or <10 in females (56) and males (13) with total percentage of 34.5 and Hb% >10 in females (51) and males (80) with total percentage of 65.5.

Significantly Hb% 10 or <10 in female: male ratio 4.3:1 were noticed. In comparison of anemic Vs non-anemic in female were 1.09:1.0, signifies more than 50% were anemic in female population. In contrast males were non-anemic Vs anemic 6.5:1.

DISCUSSION

This study primarily focused on anaemia in rural population in which females are well ahead of males in the population of anemics. Anaemia is almost exclusively prevalent in females from socially active and productive age groups. Bharati et al, observed that non-pregnant females below age 25 years and 15 to 49 age of pregnant females are anaemic.[17] According to Vijaynath et al, iron deficiency anaemia has deleterious effect on mother and fetus.[18]

In present study, severe anemia (<7gm%) is noted in 3 cases in our study who are all females and with hemoglobin (<10gm%) 84.5% are females (p value <0.005) and it is obvious that females are more vulnerable to anemia and its complications due to various reasons like blood losses during menstruation and pregnancy, increased demands during pregnancy and lactation. According to Table 1 in present study, with hemoglobin <10gm% (i.e., 67 people), 28% females (19), 16% males (11) are among geriatric age group which shows increasing prevalence of anemia in geriatric age especially among males in rural India. This is in contrast to studies done in the United States (3rd national health and nutrition examination survey (NHANES III)) to assess the prevalence of anemia in the elderly (aged >65 years), showed the prevalence to be approximately 10%, the rate being much lower to that in developing countries like India.[19]

Geriatric patients should be routinely screened for anaemia and etiological causes of anaemia individually assessed to allow timely initiation of appropriate therapy.[20]

Several studies have demonstrated poorer outcomes in older persons with anemia, including mild anemia, than in nonanemic persons of the same age. It is important that anemia in older persons receive adequate attention in clinical practice and not be considered simply a normal part of aging. In present study 36.3% of females have haemoglobin of 8-10gm%. There is an urgent need for improving overall nutritional status of adolescents through nutrition education, community awareness and supplementation programmes.[21] The need for regular blood tests to check haemoglobin levels is emphasized.

According to Capoor et al, the Government of India has initiated several supplementary nutrition programmes at the central and state level, to improve the nutritional status of the people and eradicate anaemia.[22] But these programmes made very little impact because of they did not take into account the socio-economic and political reasons of anaemia among women.[23] For example, most of the programmes address nutrition during the first six years of life, and then skip directly to pregnancy and lactation. Adolescence, which is the period of additional nutritional requirement, is not addressed through these programmes.[24] In addition to nutritional factors that cause anaemia, chronic iron losses due to parasitic infections such as hookworm and schistosomiasis may cause anemia. In persons of all ages with diseases, amelioration of anemia has been shown to have a beneficial impact on morbidity and mortality.[25-30] A significant association between anaemia and factors like personal hygiene (hand hygiene and footwear usage) and worm infestation shows the area needed to be focused. A programme focusing on improving personal hygiene and periodical deworming is needed.[31]

CONCLUSION

Despite different strategies and programs have been taken by government of India the growing menace of anaemia is not solved. So newer strategies must be taken. Nutrition component needs to be included in the school curriculum. Emphasis is needed for corrective measures of anaemia and iron deficiency in girls before they enter into adolescent age group.

Screening for anaemia, treatment of anaemic women, and availability of food fortification (wheat flour with iron and folic acid), milk sugar and salt with iron to build long term iron stores remains the key to reduce anaemia. Adolescent girls age group should be targeted, and geriatric age group should be screened for aetiologies other than nutritional.

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