

A study to assess prevalence of anaemia among beneficiaries of Anaemia Mukht Bharat Campaign in Uttarakhand

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ABSTRACT

Context: Anaemia is defined as a decreased concentration of blood haemoglobin. It is one of the most common nutritional deficiency diseases observed globally affecting both developing and developed countries. **Aims:** To find out the prevalence of anaemia among the beneficiaries of Anaemia Mukht Bharat and its association with age and gender. **Settings and Design:** A cross-sectional study was conducted in Uttarakhand by AIIMS Rishikesh in a month-long campaign including 5,776 beneficiaries. Camps were organized at the hospital campus, schools, district hospitals, Community Health Centre (CHC), Primary Health Centre (PHC), subcentres (SC), Anganwadi Centres (AWCs), slum areas, adolescent health day celebration sites and Village Health and Nutrition Day (VHND) sites. **Methods and Material:** Data on age and gender along with haemoglobin level using HemoCue Haemoglobinometer was collected. **Statistical Analysis Used:** These data were entered into Microsoft Excel and analysed to calculate the prevalence of anaemia and its association with age and gender using Epi Info software version 7. Pearson's Chi-square test was applied. *P*value <0.05 was considered as significant. **Results:** Out of 5,776 participants 53.2% were anaemic. Females (54.6%) were more anaemic than males (45.1%). 33.5% of pregnant females were found to be anaemic. **Conclusions:** Prevalence of anaemia was very high among the study participants. It shows that anaemia is a major public health problem so efforts should be taken to reduce the prevalence of anaemia and promote the health of an individual, community as well as the country.

Keywords: Anaemia, haemoglobin testing, prevalence

Introduction

Anaemia is defined as a decreased concentration of blood haemoglobin. It is a condition in which the number of red blood cells or their oxygen-carrying capacity is insufficient to meet the body's physiological requirements, which vary by age, sex, altitude, smoking habits, and during pregnancy.^[1] Its prevalence is inordinately higher among developing nations, because of low socioeconomic status and indigent access to healthcare services.^[2]

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Anaemia affects an estimated 2.36 billion individuals globally, especially women and children.^[3] The prevalence of anaemia is estimated to be higher in India when compared to all other developing countries.^[4] Also, it is the second leading cause of maternal deaths in the country.^[5] According to the National Family Health Survey 4 (NFHS-4), 58.4% of children aged 6–59 months, 53.1% of nonpregnant women aged 15–49 years, 50.3% of pregnant women aged 15–49 years, 53% of all women aged 15–49 years, 22.7% of men aged 15–49 years, 54% of adolescent girls and 29% of adolescent boys were anaemic in India.^[6]

In the short run, anaemia leads to tiredness, heart palpitations and difficulty in breathing.^[7] Children, women of reproductive

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age and pregnant women are at high risk of developing anaemia. Maternal anaemia is associated with maternal and child morbidity and mortality such as increased risk of miscarriage, stillbirth, prematurity and low birth weight of the baby.^[8] About 20% of perinatal mortality and 10% of maternal mortality in developing countries is attributed to iron deficiency.^[9]

To achieve the targets of the World Health Assembly of 50% reduction of anaemia in women of. This has been built upon the existing framework of NIPI with a special focus on intensive behaviour change communication, vulnerable geographies, procurement and supply chain management issues and others.

The primary care physician who is the backbone of the health care system and also the first contact point for a patient plays a crucial role in the identification and management of anaemia. ASHA, ANM and Anganwadi workers present at Subcentres, Anganwadi centres and PHCs should be trained and well equipped for early identification and management of anaemia in the community as in the public sector, majority of the anaemic cases can be handled at the level of primary health care level only. Also, data collected about the prevalence of anaemia will help the policymakers to further implement policies and programmes to decrease the burden of anaemia. The present study was conducted under this programme with an aim and objective to determine the prevalence of anaemia and its relationship with age and gender among the beneficiaries of Anaemia Mukh Bharat in Uttarakhand.

Subjects and Methods

Anaemia Mukh Bharat test and treat campaign

Anaemia Mukh Bharat Campaign was conducted by the Ministry of Health and Family Welfare, Government of India, in the month of September 2018 named as (Poshan Maah 2018). All India Institute of Medical Sciences (AIIMS), New Delhi was the nodal agency for its smooth functioning. A month-long campaign would be undertaken at all six new AIIMS (namely AIIMS Bhopal, Bhubaneswar, Jodhpur, Patna, Raipur and Rishikesh).^[10]

Campaign at AIIMS Rishikesh

A month-long campaign was also undertaken in Uttarakhand by AIIMS Rishikesh in the urban and rural areas through various outreach camps. Camps were organized at the hospital campus, schools, District Hospitals, CHC, PHC, SC, AWCs, slum areas, Adolescent health day celebration sites, and VHND sites. Haemoglobin testing was done. Banners, posters, pamphlets were displayed at places such as schools, AWCs, hospital campus etc., A total of 5,776 beneficiaries were screened. All male and female of age groups <5 years, 5-14 years and ≥15 years were included. The beneficiaries were tested for haemoglobin level using HemoCue Hemoglobinometer. Cut off values of Haemoglobin to diagnose anemia was taken from Table 1.^[11]

HemoCue haemoglobinometer

The HemoCue Hb 301 System (Kit) is a safe and convenient solution when performing mobile anaemia screening programmes. The robust HemoCue Hb 301 System is an accurate and effective tool for anaemia screening also in a demanding climate with high temperature and humidity. It is optimized for use in primary care and blood donation settings – in urban as well as in rural settings.

Inclusion criteria

1. All male and female of age groups <5 years, 5–14 years and ≥15 years were included.
2. All those who gave consent to participate in the study.

Exclusion criteria

1. All those who did not give consent to participate in the study or showed hostile behaviour.
2. All those who were critically and terminally ill.

Data analysis

Haemoglobin level along with information on age and gender was collected and entered into Microsoft excel. Then data were analysed to calculate the prevalence of anaemia and its association with age and gender using Epi Info software version 7. Pearson's Chi-square test was applied. *P* value <0.05 was considered as significant.

Ethical clearance

The study was ethically approved by the ethical committee of the institute (29/11/2019). The protocol and importance of the study were explained to the participants before recruitment into the study, followed by a signed informed consent by them.

Results

A total of 5,776 participants were screened for anaemia comprising 834 (14.4%) males and 4,942 (85.6%) females. Out of 4,942 females, 164 (3.3%) females were pregnant and 4,778 (96.7%) nonpregnant.

As shown in Table 2 overall prevalence of anaemia was found to be 53.2% and out of which 45.1% were anaemic males and 54.6% anaemic females. Similarly, out of 4,942 females nonpregnant females were more anaemic (55.3%) than pregnant females (33.5%).

Males were more anaemic (53.2%) in the age group less than five years whereas females were more anaemic in the age group 5–14 years (51.1%) and 15–49 (57.1%) years.

Table 3 shows the distribution of participants in various age groups depending on the severity of anaemia. Mild moderate and severe anaemia was more in the participants belonging to 15–49 years of age group. Females in each age group were moderately and severely more anaemic than males.

Figure 1 shows that out of 164 ANC females 55 (33.5%) were anaemic. Out of these anaemic 32 (19.5%) had mild anaemia whereas 18 (11.0%) and 5 (3.0%) had moderate and severe anaemia, respectively.

Discussion

In the present study, overall 53.2% beneficiaries were anaemic out of which 45.1% were anaemic males and 54.9% anaemic females. It is similar to the study done by Malhotra *et al.* in North India^[12] in which the overall prevalence of anaemia was 47.9% being 50% among females and 44.3% among males. As seen in the present study, total anaemic children of the age group <5 years is 46.9% which is lower than the values (59.8%) seen in the NFHS 4 data of Uttarakhand.^[13] A study was done by Nanjunda *et al.* in

South Karnataka^[14] showed that 62% of under 5 children were anaemic which is also higher than the present study. Similarly in the present study in the age group 15–49 years the anaemic males were (45.4%) and females (57.1%) which is quite high than the NFHS 4 data of Uttarakhand,^[13] male (15.5%) and females (46.2%) In the present study, anaemia in pregnancy was 33.5%, out of which 19.5% had mild anaemia whereas 11.0% and 3.0% had moderate and severe anaemia, respectively. In a study done by Bara *et al.* in Jharkhand,^[15] 76% of pregnant women were anaemic and out of the 20% of cases were mild anaemia, 44% of moderate anaemia and 31% of severe anaemia. Similarly, a study done by Alene *et al.* in eastern Ethiopia^[16] anaemia in pregnancy was 56.8%, out of them 1.2% of them were severely anaemic, 26.7% were moderately, and 28.9% were mildly anaemic. According to the NFHS 4 report of Uttarakhand^[13] anaemia in pregnancy is 46.5%.

Table 1: Haemoglobin levels to diagnose anaemia (g/dL)^[11]

Population	No Anaemia	Anaemia		
		Mild	Moderate	Severe
Children 6-59 months of age	≥11	10-10.9	7-9.9	<7
Children 5-11 years of age	≥11.5	11-11.4	8-10.9	<8
Children 12-14 years of age	≥12	11-11.9	8-10.9	<8
Non-pregnant women (15 years of age and above)	≥12	11-11.9	8-10.9	<8
Pregnant women	≥11	10-10.9	7-9.9	<7
Men, 15 years of age and above	≥13	11-12.9	8-10.9	<8

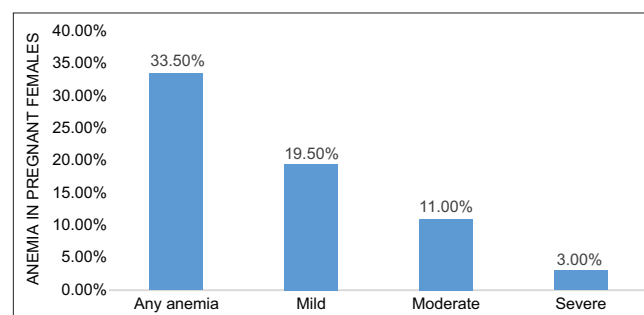


Figure 1: Distribution of pregnant females according to classification of anaemia (N = 164). Attached separately

Table 2: Age and sex-wise prevalence of anaemia among study participants (n=5,612)

Study participants	Number of study participants screened	Number of cases with anaemia No. (%)	Chi-square P
Children (Under 5 years)			
Male	158	84 (53.2%)	Chi-square: 4.671 P: 0.0307
Female	172	71 (41.3%)	
Children (5-14 years)			
Male	401	167 (41.6%)	Chi-square: 10.122 P: 0.0015
Female	977	499 (51.1%)	
Adults (15-49 years)			
Male	275	125 (45.4%)	Chi-square: 14.216 P: 0.0002
Females	3629	2074 (57.1%)	

Table 3: Distribution of study participants according to the classification of anaemia as mild, moderate and severe (n=5612)

Age group	Total	No anaemia		Mild anaemia		Moderate anaemia		Severe anaemia	
		No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
Children (Under 5 years)	330	175	53.0	69	20.9	56	17.0	30	9.1
Male	158	74	46.8	46	29.1	25	15.8	13	8.2
Female	172	101	58.7	23	13.3	31	18.0	17	9.8
Children (5-14 years)	1378	712	51.7	318	23.1	240	17.4	108	7.8
Male	401	234	57.9	79	19.7	59	14.6	29	7.2
Female	977	478	48.9	239	24.4	181	18.5	79	8.1
Adults (15-49 years)	3904	1705	43.7	935	23.9	750	19.2	514	13.2
Male	275	150	54.5	51	18.5	47	17.2	27	9.8
Female	3629	1555	42.8	884	24.3	703	19.3	487	13.4

Conclusion and Recommendation

The present study shows that the prevalence of anaemia was very high among the study participants. Females were more anaemic than males. The prevalence of moderate and severe anaemia was also high among females.

So, it is clearly seen that despite the progress made for anaemia reduction in the last decade especially in children and women, anaemia continues to be a major public health concern in India. To accelerate anaemia reduction health interventions should be targeted at pregnant women together with interventions for women and children during childhood. A holistic approach is needed. Various measures should be taken to combat anaemia such as eating nutritious and iron-rich foods, IFA supplementation during pregnancy and lactation, weekly iron-folic supplements for adolescents, deworming, health education, provision of fortified foods and screening and treatment of nonnutritional causes of anaemia. Improving women's education and empowering them is also important so they can make better dietary choices for themselves and their families.

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Conflicts of interest

There are no conflicts of interest.

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