Assessment of Nutritional Anaemia and its Predisposing Factors among Women of Reproductive Age Group in a Slum of Kolkata, West Bengal, India

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ABSTRACT

Introduction: Anaemia is a major public health problem affecting women of reproductive age groups all over the world. As per NFHS-IV data, prevalence of anaemia in India is 53% and in urban areas of West Bengal is 58.2%. Studies conducted among women of reproductive age in slums of Mumbai and Bhubaneswar, the prevalence of anaemia was 49.5% and 60.8% respectively.

Aim: To assess the nutritional anaemia and its predisposing factors among women of reproductive age group in a slum of Kolkata, West Bengal, India.

Materials and Methods: A community based cross-sectional study was carried out in a slum of Kolkata, West Bengal, India. Total study participants enrolled were 122 women of the reproductive age group (15-49 years). The surveyed women were gathered in three days through three different camps organised in the field service area of Urban Health Unit and Training Center, Chetla. All the respondents were interviewed and anthropometric measurement and blood examination were carried out. Data was analysed using SPSS version 16 and chi-square test was used to find out the association between variables.

Results: Among all women, 112 (91.8%) had anaemia with proportion of mild and moderate anaemia being 67.2% and 24.6%, respectively. No woman was suffering from severe anaemia. The factors associated with anaemia were age, education, socio-economic status, parity, abortion, interval between two successive pregnancies less than three years, menorrhagia, BMI and dietary habits.

Conclusion: The current study noted that education level, socio-economic status, consumption of iron rich food, increased order of pregnancies and abortion, interval between successive pregnancies affect the blood haemoglobin level successively. To increase the health awareness and decrease the prevalence of anaemia, community awareness about iron folic acid supplementation and schooling of girls, decreasing school dropout are to be addressed.

INTRODUCTION

Anaemia is a major public health problem worldwide particularly in developing countries affecting all age groups. Anaemia is a sign of an underlying disorder not a specific disease and is the commonest haematological condition. WHO defines anaemia as a condition where the number or oxygen-carrying capacity of red blood cells is not sufficient to conduct the normal daily activity of human being, which may vary according to age, sex, pregnancy status, smoking habit and altitude [1].

One of the priority target groups is women of reproductive age due to excessive loss of iron or increased demand of iron during menstruation and child birth. Due to anaemia, women face enormous consequences as the condition affects their productive as well as reproductive capabilities. It is one of the main causes of morbidity, mortality in reproductive age and foetal wastage, low birth weight babies, high perinatal mortality. The common causes of anaemia include: the iron deficiency anaemia; folate, vitamin B12 and vitamin A deficiency; chronic inflammation; parasitic infections; and inherited disorders [1]. Iron deficiency may impair cellular immunity leading to increased susceptibility of infection.

National Family Health Survey-IV data shows that more than half of the women (53.0%) in India in reproductive age group (15-49 years) are anaemic [2]. In West Bengal 62.5% of women in reproductive age group is anaemic and 58.2% among urban population [2]. Poverty, inadequate diet, pregnancy, lactation, poor educational level and poor access to health services are the predominant social factors responsible for this condition among

women [3]. Women living in slums are more prone to suffer from this disorder as all the above mentioned factors are part and parcel of their lives. There is no significant decline in anaemia as in NFHS-3 (2005-2006) it was 55.3% [4], while in NFHS-4 (2015-2016) it is 53.0% [2]. In spite of various programmes conducted by Government of India, anaemia is still prevailing in mainly the women of reproductive age group. With this, the study was undertaken to assess proportion of Nutritional Anaemia and its predisposing factors among women of reproductive age group in an urban slum of Kolkata, West Bengal, India.

MATERIALS AND METHODS

This cross-sectional community based observational study conducted for three months from January to March, 2018 in a slum in South Kolkata under Urban Health Unit and Training Center (UHU & TC), Chetla, which is the urban field practice area of All India Institute of Hygiene and Public Health, Kolkata, West Bengal, India. This slum is about 2 km away from the Health Unit. The study area was chosen by the researcher for the convenience and easy accessibility of the study participants. The study was approved by Institutional Ethics Committee, AIIH & PH, Kolkata and procedure for biomedical waste management was maintained.

Ever married women aged between 15 and 49 years was the inclusion criteria and while those not willing to participate in the study, pregnant, postmenopausal and those suffering from chronic illness, infection, mental disorder were excluded from the study. Pretesting was carried out among 10 women of reproductive age in different area of that urban slum. Camp based approach was

adopted for data collection as well as blood collection which were then sent to the laboratory of UHU & TC, Chetla for further evaluation of haemoglobin status. After sensitisation of the women of reproductive age living in the area by Health Workers of UHU&TC, Chetla, were informed to attend the camp on three prefixed dates. Data collection could be done of 124 women out of 128 who attended the camps; two women further referred to undergo blood testing and were therefore exempted from data analysis finally. Total 122 study subjects were included in the study.

All relevant information including socio-demographic characteristics, reproductive history, dietary habits etc., were gathered using the predesigned and pretested schedule. Socio-economic status was estimated according to the modified BG Prasad scale (January 2017). For dietary history, intake of the non-vegetarian like fish, meat, egg etc., green leafy vegetables, pulses, milk and milk products by the respondents during the last week by Dietary Diversity Score (DDS) and food group wise for last 24 hours from morning after waking up to night before going to bed using Minimum Dietary Diversity for Women (MDDW) were obtained. Adequate intake was considered in terms of consumption for more than median number of days for each food item Green Leafy Vegetable (GLV) (<5 days), non-vegetarian food items {fish/meat/egg(<4days)}, pulses (<2 days) during the last week. Adequacy of diet for last 24 hours was considered for consumption of more than five food groups: 1) Grains, white root and tuber; 2) Pulses like peas, beans and lentils; 3) Nuts and seed; 4) Dairy; 5) Meat, poultry and fish; 6) Eggs; 7) Dark GLV; 8) Vitamin A rich fruits and vegetables; 9) Other vegetables; 10) Other fruits and food group consumption >15 gram to be counted.

Anthropometric measurement of height and weight of the study subjects was carried out following Standard Operating Procedure (SOP) using portable analogue weighing machine, non-stretchable measuring tape and to calculate BMI, WHO classification was used. For haematological investigations, 2 mL of venous blood from each study participant was collected in a labelled vacutainer containing EDTA (anticoagulant). All the sample containers were sent to laboratory, where the haemoglobin estimation was done by the cyanmethaemoglobin method. For interpretation of anaemia, cut-off point for haemoglobin level taken was <12 g/dL [5]. The severity of anaemia was graded as mild (10 - <12 g/dL), moderate (7 - <10 g/dL) and severe (<7g/dL) [6].

For RBC morphology, a thin blood smear was prepared on a labelled clean glass slide and allowed to dry. Smear was stained with Leishman's stain and examined under the high power of the microscope. Opinion of a pathologist was taken while doing RBC morphology. The peripheral smear examination showed microcytic hypochromic anaemia indicative of iron deficiency, early stages of iron deficiency by normocytic hypochromic picture, dimorphic for the presence of iron deficiency anaemia and folic acid/vitamin B12 deficiency (relevant figures provided later).

STATISTICAL ANALYSIS

All information collected was compiled and data were analysed using SPSS Software programme (version 16.0). Descriptive and analytical results are presented through tables and association between variables was stated by Chi-square test.

RESULTS

Among the surveyed women, 112 (91.8%) had anaemia and only 10 (8.2%) had normal haemoglobin level (>12 mg/dL) [Table/Fig-1]. The mean (±SD) age of women of reproductive age group was found to be 30.54 (±8.09) years ranging from 15 years to 49 years. All the women of 15 to 19 years and 45 to 49 years age group were anaemic. The characteristic peripheral smears are provided [Table/Fig-2a-d].

Characteristics	No (%)
1. Blood haemoglobin level	
No anaemia	10 (8.2)
Mild anaemia	82 (67.2)
Moderate anaemia	30 (24.6)
2. RBC morphology	
Normocytic normochromic	10 (8.2)
Normocytic hypochromic	62 (50.8)
Microcytic hypochromic	45 (36.9)
Macrocytic hypochromic	5 (4.1)

[Table/Fig-1]: Distribution of study subjects according to type of Anaemia (n=122).
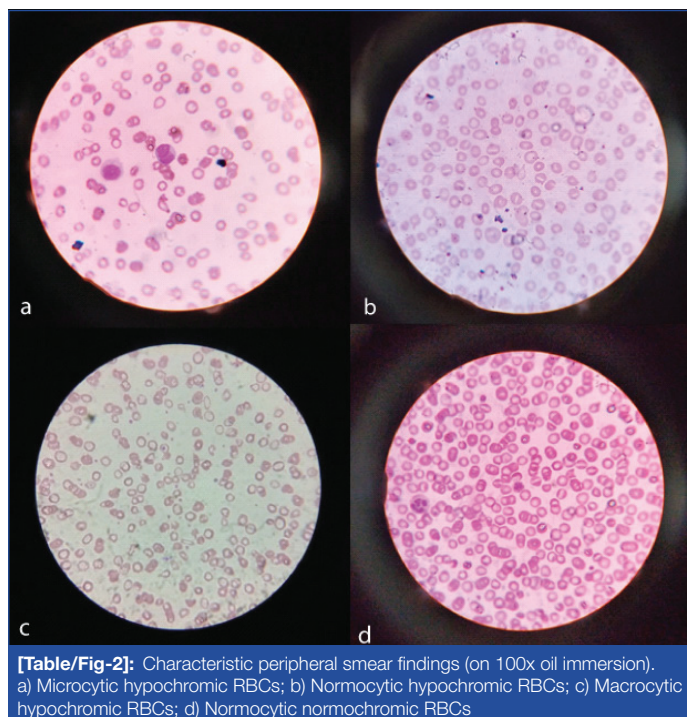
[Table/Fig-2]: Characteristic peripheral smear findings (on 100x oil immersion). a) Microcytic hypochromic RBCs; b) Normocytic hypochromic RBCs; c) Macrocytic hypochromic RBCs; d) Normocytic normochromic RBCs

Among them 35 (28.7%) were illiterate. A total of 119 (97.5%) study participants were currently married. Approximately, 75% of the women worked for pay. The husbands of 31.9% of the study participants studied up to middle level of school, while 22 (18%) were illiterate and majority of them (74.6%) were unskilled labour. Seventy (57.4%) of the females were from nuclear and 52 (42.6%) from joint family. About half of the study participants belonged to Lower middle class (53.2%), followed by Middle class (43.4%), Upper middle class (2.4%) and Lower class (0.8%), respectively. Among the study participants 61 (50%) had menarche in 13-14 years of age and 26 (21.3%) of them had irregular menstrual cycle. Among women 10 (8.2%) had excessive menstrual bleeding and 50 (41%) had scanty menstruation. Among all women 8.2% had one, 38.5% with two, 19.7% with three and 12.3% with four or more pregnancies. 88.39% of study participants had 1st pregnancy before 19 years of age while 79.5% had 1st child birth before the age of 20 years. A total of 53 (43.4%) of women had two and 25 (19.6%) had three living children. Majority (54.1%) of them had interval between last two pregnancies was 2-6 years. A 22.32% of women reported history of abortion. Among them were 28% with spontaneous and 72% with induced abortion. Majority of women who had the practice of temporary family planning method and Oral Contraceptive Pill usage was 68%.

All of the women used to take mixed diet. Among the study participants, 71 (58.1%), 96 (78.7%), 84 (68.9%) had adequate intake of GLV, non-veg., pulse respectively. Nobody had the habit of taking of milk and milk product and dietary diversity according to food group. They used to walk outside barefooted and no one among the study participants had deworming within last six months. They did not wash before having food with soap and water.

The factors with increased number of participants with anaemia were age, occupation, marital status, type of family, level of education, per capita income, menorrhagia, number of pregnancies, interval between two successive pregnancies less than three years, history of abortion, BMI, dietary habits and was not associated significantly expect interval between two successive pregnancies, non-vegetarian food and pulses intake [Table/Fig-3]. Mann-Whitney U test showed no significant difference in haemoglobin level across the groups.

Characteristics	Anaemia	No anaemia	Mean (±SD) Hb	χ^2, df, p-value
1. Age (Years)				
32-49	46 (95.8)	2 (4.2)	10.31 (±0.87)	1.7, 1, 0.19
15-31	66 (89.2)	8 (10.2)	10.67 (±0.90)	
2. Occupation				
Work for pay	85 (93.4)	6 (6.6)	10.66 (±0.94)	1.22, 1, 0.26
Home Maker	27 (87.1)	4 (12.9)	10.49 (±0.89)	
3. Marital status				
Widow	3 (100)	0 (0)	10.40 (±0.20)	0.27, 1, 0.6
Married	109 (91.6)	10 (8.4)	10.53 (±0.91)	
4. Type of family				
Joint	50 (96.2)	2 (3.8)	10.45 (±0.82)	2.28, 1, 0.31
Nuclear	62 (88.6)	8 (11.4)	10.59 (±0.95)	
5. Education level				
Illiterate	33 (94.3)	2 (5.7)	10.36 (±0.90)	0.40, 1, 0.52
Literate	79 (90.8)	8 (9.2)	10.60 (±0.90)	
6. Monthly family income				
PCI ≤Rs.1817	61 (93.8)	4 (6.2)	10.38 (±0.90)	0.77, 1, 0.38
PCI >Rs.1817	51 (89.5)	6 (10.5)	10.69 (±0.88)	
7. Menorrhagia				
Yes	10 (100)	0 (0)	10.27 (±0.84)	0.97, 1, 0.32
No	102 (91.9)	10 (8.9)	10.55 (±0.91)	
8. Number of pregnancy				
More than 2 pregnancies	38 (97.4)	1 (2.6)	10.37 (±0.86)	2.41, 1, 0.12
Up to 2 pregnancy	74 (89.2)	9 (10.8)	10.60 (±0.92)	
9. Interval between pregnancies				
Up to 3 years	47 (100)	0 (0)	10.26 (±0.77)	6.8, 1, 0.009*
More than 3 years	65 (86.7)	10(13.3)	10.69 (±0.94)	
10. History of abortion				
Yes	25 (100.0)	0 (0)	10.25 (±0.92)	2.87, 1, 0.24
No	87 (89.7)	10 (10.3)	10.60 (±0.79)	
11. Dietary habits				
a) GLV				
<5 days/week	48 (94.1)	3 (5.9)	10.44 (±0.84)	0.62, 1, 0.43
≥5 days/week	64 (90.1)	7 (9.9)	10.59 (±0.94)	
b) Non-veg.				
<4 days/week	24 (92.3)	2 (7.7)	10.42 (±0.86)	0.01, 1, 0.91
≤4 days/week	88 (91.7)	8 (8.3)	10.56 (±0.91)	
c) Pulses				
<2 days/week	35 (92.1)	3 (7.9)	10.67 (±0.81)	0.007, 1, 0.93
≥2 days/week	77 (91.7)	7 (8.3)	10.46 (±0.94)	
12. Diet score				
≤9 score	65 (97.0)	2 (3.0)	10.43 (±0.77)	5.364, 1, 0.021*
>9 score	47 (85.5)	8 (14.5)	10.66 (±1.04)	
13. BMI				
Less than normal	10 (100.0)	0 (0)	10.54 (±0.71)	4.29, 1, 0.11
More than normal	60 (95.2)	3 (4.8)	10.54 (±0.81)	
Normal	42 (85.7)	7 (14.3)	10.54 (±1.05)	

[Table/Fig-3]: Factors associated with anaemia (Chi-square Test) (n=122).
*p-value < 0.05 was considered statistically significant

DISCUSSION

The community based cross-sectional study described that the prevalence of anaemia among ever married women of reproductive age (15 to 49 years) was 91.8% (112) and 67.2% with mild, 24.6% moderate anaemia. Among all the study participants, 50.8% (62), 36.9% (45), 4.1% (5) were with normocytic hypochromic, microcytic hypochromic, macrocytic hypochromic anaemia respectively. Majority of them had iron deficiency anaemia. Anaemia in women of reproductive age group leads to ill health of the mother and newborn resulting to maternal mortality and low birth weight baby. This is a vicious cycle.

A study by Panigrahi A et al., in an urban slum in Bhubaneswar detected that the prevalence of anaemia among women of reproductive age was 60.8% [5]. The prevalence of anaemia among women of reproductive age was 49.5% in the study conducted by Lilare RR et al., in an urban slum in Mumbai [6]. In a study by Pande D et al., in an urban slum of Indore city where prevalence of anaemia among the women of reproductive age was 61% [7]. Another study among women of reproductive age in Turkey, the prevalence of anaemia was 27.8% which was much lower than this study [8]. In all the studies, the prevalence of anaemia was lower than the current study which might be due to difference in study setting.

In the study by Srivastava S et al., in Gadia Barabanki, Uttar Pradesh, 94.5% of women of reproductive age group (15-49 years) were anaemic and majority of them had mild to moderate anaemia [9], which is similar to the current study though the study setting was different. In the current study, anaemia is more in higher age group 32-49 years in contrary to the finding observed by Lilare RR et al., in an urban slum in Mumbai [6], where 15-25 years age women were affected.

In the present study women with anaemia were noted more in illiterate group which is similar to the study by Panigrahi A et al., in an urban slum in Bhubanrswar, Orissa [5], and the study by Lilare RR et al., in an urban slum in Mumbai [6]. Anaemia was found more in joint and lower income group of families in this study and similarity was observed in the study conducted by Panigrahi A et al., in an urban slum in Bhubaneswar, Orissa [5].

In the current study anaemia was present in women who had more than 2 pregnancies and similar finding was reported among women of reproductive age in the studies by Lilare RR et al., in an urban slum in Mumbai [6], and Viveki RG et al., among pregnant women from second trimester onwards attending the centre for Antenatal check-up for the first time in field practice area of Urban Health Training Centre of Department of Community Medicine, Belgaum Institute of Medical Sciences, Belgaum, Karnataka [10].

In this study, anaemia in women was high with interval of two pregnancies less than three years which is similar to the finding in studies by Lilare RR et al., Raghuram V et al., and Cheema HK et al., [6,11,12]. Prevalence of anaemia was found to be significantly associated with history of excessive menstrual bleeding in the study by Panigrahi A et al., in Orissa [5] which was similar to the current study. In this study, it was noted that anaemia is more among the women with intake of less GLV and similar findings were observed by Panigrahi A et al., in an urban slum in Bhubaneswar, Orissa [5].

LIMITATION

The study was conducted in camp based mode. So, it might have missed some of the women who couldn't attend the camp.

CONCLUSION

Anaemia is a major public health problem among women of reproductive age group of urban slums. Education level, socio-economic status, consumption of iron rich food, increased order of

pregnancies and abortion, interval between successive pregnancies affect the overall blood haemoglobin level later. To increase the health awareness and decrease the prevalence of anaemia, community awareness and schooling of girls, decreasing school dropout are addressed. Certain activities which may improve the haemoglobin status are iron folic acid supplementation, service delivery by grass root level worker to the pregnant and lactating women, women availing family planning services in the regime dose etc. Community participation for mass screening session for anaemia should be conducted. The de-worming and nutritional supplementation activities will further help alleviate the situation at large scale.

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