Research Article

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Study of nutritional anaemia amongst non-pregnant women of reproductive age group in an urban slum of Mumbai, Maharashtra, India

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ABSTRACT

Background: Anaemia is rampant in India. Nutritional anaemia is one of the most frequently observed deficiencies throughout the world among the women of reproductive age group particularly during pregnancy and very often contributing to maternal deaths.

Methods: A cross-sectional study was carried out in field practice area of department of community medicine of a tertiary care teaching hospital i.e. Lokmanya Tilak Municipal Medical College and General Hospital, Mumbai during the period of June 1999 to December 2000. A total of 288 non-pregnant women were included and a pre-designed and pre-tested questionnaire was used for the study. Data was analyzed by using statistical package of social sciences (SPSS) version 17.0.

Results: In the present study, out of 288 participants, 134 (46.5%) women were found anaemic. Anaemia was classified into mild 70 (52.2%), moderate 58 (43.3%) and severe 6 (4.5%). Majority 44.1% belongs to the age group of 15 to 24 years and maximum were Hindu i.e. 89.9% and 92% were married and 72.9% belongs to nuclear type of family and 60.4% had primary to secondary level of education followed by 37.2% who were illiterate and 30.5% had marriage below 15 years of age. 62.8% who belong to joint families and 65.4% of illiterate women were anaemic.

Conclusions: In present study, prevalence of nutritional anaemia is widely present in women from 15 to 45 years of age. Occupation and education have a direct effect on socio-economic status thus leading to nutritional anaemia. There is a need to promote, educate and increase the awareness regarding the National health programs at the community level.

Keywords: Nutritional anaemia, Non-pregnant women, Reproductive age group, Urban slum

INTRODUCTION

Nutritional anaemia has been defined by World Health Organization (WHO) as "a condition in which the haemoglobin content of blood is lower than normal as a result of a deficiency of one or more essential nutrients, regardless of the cause of such deficiency." Anaemia is derived from Greek word literally meaning without (an) blood (haem). The Charak Samhita describes fatigue and

pallor due to bloodlessness and means of remedying it using "Lauha Bhasma" or calcinied iron. In the 1800's Anaemia, Hypochromia and lack of iron in the blood was described by Hoefer, Poff and Foedisch respectively. In 1832, Pierre Blaud rightly ascribed the response to his famous pills containing ferrous sulphate. Nutritional Anaemia was thus well known to physicians since ancient times.²

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Nutritional anaemia is a problem of serious public health significance because it has its impact on psychological, physical and work performance of an individual and also since its adverse functional effects have social educational and economic implications especially in developing countries where hard physical labour is dominant form of gainful employment.³

According to the WHO estimates, the prevalence of nutritional anaemia in developing countries is 60% in pregnant women and 49% in non-pregnant women. In view of the above, the present study was carried out to estimate the prevalence of anaemia among non-pregnant women of reproductive age group i.e. 15 to 45 years of age and to find out the various socio-demographic and biological factors associated with it.

METHODS

A cross-sectional study was carried out in the field practice area of department of community medicine of a tertiary care teaching hospital i.e. Lokmanya Tilak Municipal Medical College and General Hospital, Mumbai during the period of June 1999 to December 2000. A total of 288 non-pregnant women were included and a pre-designed and pre-tested questionnaire was used for the study. Study was carried out with appropriate patient consent and the institutional ethics committee approval. Non-pregnant, non-lactating women between 15 to 45 years age group, both married and unmarried were selected.

Women from all classes and who were and are going to reside in the community for atleast four months were included in the study. In all 298 women were identified to be between 15 to 45 years age group. Of these four became pregnant after one month and six refused later to take part in study due to gastric intolerance. Therefore the final sample size became 288 women. All the study women were selected by systematic random sampling method, were visited at their respective houses and were interviewed. Attempts were made to establish good rapport with the study group.

The objectives of the study were explained. A detailed history of the respondents was obtained and clinical examination was done to assess anaemia status. The structured proforma was then used and filled personally by interviewing the women who were suspected to be suffering from nutritional anaemia.

The anaemic status of these women was determined by Sahali's method of haemoglobin estimation. Every woman was informed regarding her haemoglobin status. Since the possible cause was identified as nutritional in nature, health education regarding the cause, its effect, its treatment and prevention was given individually to each of these women at their home, in their own language.

As per WHO, the degree of anaemia amongst these women were determined and classified as mild, moderate and severe on the basis of haemoglobin levels i.e. mild > 10 gm%; moderate 7 to 10 gm% and severe < 7 gm%.

Statistical analysis

The statistical analysis was performed by using SPSS software (version 17.0). All values are expressed in the form of percentages, proportions, mean and standard deviation and the chi-square test was applied wherever necessary. Statistical significance was set at $P \le 0.05$.

RESULTS

It was observed from Table 1 that, out of the total 288 women, 44.1% belong to age group of 15-24 years and 43.4% belong to 25-34 years age group. Maximum were Hindu i.e. 89.9%, and 9.4% were Muslim and only 0.7% were Christian. 92% were married and 72.9% belongs to nuclear type of family and 76.4% were housewives or unemployed and 60.4% had primary to secondary level education followed by 37.2% who were illiterate and 47.6% had their marriage at 16 to 18 years followed by

30.5% had marriage below 15 years of age. Out of 288 women, 134 (46.5%) women were found anaemic. Anaemia was classified into mild 70 (52.2%), moderate 58 (43.3%) and severe 6 (4.5%). Majority 47.6% women had their marriage at 16 to 18 years followed by 30.5% below 15 years of age. 40.5% women were having more than or equal to 3 children followed by 33.8% had 2 children and remaining 17.5% were having one child.

It was seen from Table 2 that, 59.8% women who belong to 15-24 years age group were anaemic which is significantly higher than the 39.2% amongst 25-34 years age group. 62.8% women who belong to joint families were anaemic which is significantly higher as compared to 40.5% among nuclear families. Socio-economic status of women is highly correlated with percentage of anaemia i.e. the women who belong to class V had 70.4% of anaemia which is significantly very high as compared to 22.6% of those who belonged to class II. Majority 53.6% of unemployed women were anaemic compared to 44.6% of women who were doing unskilled and semiskilled work.

Education of women has significant association with percentage of anaemia i.e. 65.4% of illiterate women were anaemic which is significantly higher as compared to 43.1% amongst secondary and higher educated women. 29.8% and 41.7% of total women who had one and two children were anaemic, which was significantly less as compared to those who have 3 and 4 or more than 4 children's. 61% of total women who had marriage below 15 years of age were anaemic which is significantly very high as compared to 32.2% who had marriage at more than 18 years of age.

Table 1: Socio-demographic characteristics of the study population.

Socio-demographic	Number	Donocutore		
profile	Number	Percentage		
Age (in years)	(n=288)			
15 – 24	127	44.1		
25 – 34	125	43.4		
35 – 45	36	12.5		
Education	(n=288)			
Illiterate	107	37.2		
Primary	115	39.9		
Secondary	59	20.5		
Higher secondary	07	2.4		
Graduate	00	0.00		
Occupation	(n=288)			
Unemployed	220	76.4		
Unskilled	33	11.5		
Semiskilled	07	2.4		
Petty business	28	9.7		
Socio-economic status	(n=288)			
Class i (upper)	01	0.34		
Class ii (upper middle)	31	10.76		
Class iii (lower middle)	84	29.16		
Class iv (upper lower)	145	50.35		
Class v (lower)	27	9.4		
Type of family	(n=288)			
Nuclear	210	72.9		
Joint	78	27.1		
Extended	00	0.00		
Marital status	(n=288)	0.00		
Unmarried	19	6.6		
Married	265	92.0		
Widow	04	1.4		
Divorce/separate	00	0.00		
Religion	(n=288)	0.00		
Hindu	259	89.9		
Muslim	27	9.4		
Christian	02	0.7		
Hb level (gm%)	(n=134)	0.7		
Mild (10-12 gm%)	70	52.2		
Moderate (7-10 gm%)	58	43.3		
Severe (<7 gm%)	06	4.5		
Age at marriage	(n=269)	T.J		
Age at marriage ≤ 5 years	82	30.5		
16-18 years	128	47.6		
>18 years	59	21.9		
		41.7		
No. of living children	(n=269) 22	0.2		
1	47	8.2		
2		17.5		
3	91	33.8		
	61	22.7		
≥4 D: .	48	17.8		
Diet	(n=288)	21.0		
Vegetarian	92	31.9		
Non-vegetarian	196	68.1		

Table 2: Association between socio-demographic profile and nutritional anaemia.

Socio-	No. of	Anaemia		p-
demographic profile	Women	Yes	No (%)	value
prome		(%)	140 (70)	
Age (in years)	(n=288)	(n=134)	(n=154)	$X^2 =$
15-24	127	76 (59.8)	51 (40.2)	18.45
25-34	125	49 (39.2)	76 (60.8)	P <
35-45	38	09 (25.0)	27 (75.0)	0.001
Type of Family	(n=288)	(n=134)	(n=154)	$X^2 =$
Nuclear	210	85 (40.5)	125 (59.5)	10.54 P <
Joint	78	49 (62.8)	29 (37.2)	0.05
Extended	00	00	00	
Socio-economic status	(n=288)	(n=134)	(n=154)	
Class I	01	00 (0.00)	01 (100)	$X^2 =$
Class II	31	07 (22.6)	24 (77.4)	17.33
Class III	84	33 (39.3)	51 (60.7)	P <
Class IV	145	75 (51.7)		0.0006
Class V	27	19 (70.4)	08 (29.6)	
Occupational				
status	(n=288)	(n=134)	(n=154)	$X^2 =$
Unemployed	220	118 (53.4)	102 (46.6)	X = 20.10
Unskilled	33	10 (30.3)	23 (69.7)	P <
Semi-skilled	07	01 (14.3)	06 (85.7)	0.05
Petty business	28	05 (17.8)	23 (82.2)	
Educational	26	03 (17.6)	23 (62.2)	
status	(n=288)	(n=134)	(n=154)	
Illiterate	107	70 (65.4)	37 (34.6)	$X^2 =$
Primary	115	46 (40.0)	69 (60.0)	27.15
Secondary	59	17 (28.8)	42 (71.2)	P <
Higher Secondary	07	01 (14.3)	06 (85.7)	0.001
Graduate	00	00 (0.00)	00 (0.00)	
No. of living children	(n=269)	(n=127)	(n=142)	2
0	22	03 (15.6)	19 (84.4)	$X^2 =$
1	47	14 (29.8)	33 (70.2)	0.742 P <
2	91	38 (41.7)	53 (58.3)	0.05
3	61	37 (60.6)	24 (39.4)	0.03
≥4	48	35 (72.9)	13 (27.1)	
Age at	(n=269)	(n=127)	(n=142)	$X^2 =$
Marriage	(H-207)	(11-121)	(11-174)	X = 11.75
<15 yrs	82	50 (61.0)	32 (39.0)	P <
15-18 yrs	128	58 (45.3)	70 (54.7)	0.002
>18 yrs	59	19 (32.2)	40 (67.8)	
Diet	(n=288)	(n=134)	(n=154)	$X^2 =$
Vegetarian	92	51 (55.4)	41 (44.6)	3.80
Non-	196	83 (42.3)	113	P <
vegetarian		(.2.5)	(57.7)	0.512

DISCUSSION

The present study conducted among 288 women revealed the overall prevalence of anaemia around 46.5% with mild, moderate, and severe anaemia being 52.2%, 43.3%, and 4.5% respectively. National Nutritional Anaemia Prophylaxis Program (NNAPP) was initiated in 1970 during forty five year plan with the aim to reduce the prevalence of anaemia to 25%. Socio-economic status of women is highly correlated with percentage of anaemia i.e. the women who belong to class V had 70.4% of anaemia which is significantly very high as compared to 22.6% of those who belonged to class II. Similarly a study done by Huddle JM et al in Malawian women, 75% fell into the lowest socio-economic status i.e. class V and 19.4% in class II category, and only 4.2% fell into the class I category.5 Another study done by Calvo et al proposed that iron status was significantly associated with socio-economic status, prevalences being 53%, 34.2% and 43.2% for high, middle and low socio-economic groups respectively.

Majority 62.8% women who belong to joint families were anaemic which is significantly higher as compared to 40.5% among nuclear families. Similarly study done by Johnson et al in Guyana, reported a prevalence of 54.8% in women of child bearing age group, number of family members being an important factor.⁷

Education of women has significant association with percentage of anaemia i.e. 65.4% of illiterate women were anaemic which is significantly higher as compared to 27.3% amongst secondary and higher educated women. Similarly a study done by Bharadwaj et al proposed an important relation between educational status of women and anaemic status of women in their study at Shimla in 30 cluster villages. They found that only 2.1% of illiterate women and almost 53.8% of women who had studied SSC and above had completed the full course of iron folic acid supplementation. Another study done by Huddle et al. reported iron deficiency anaemia in 69% of women who had little or no formal education.

In our study, 29.8% and 41.7% of total women who had one and two children were anaemic, which was significantly less as compared to those who have 3 and 4 or more than 4 childrens. Similarly study done by Roysten in Bangkok (Thailand), the prevalence of anaemia doubled after 3rd pregnancy and increased fivefold after 5th pregnancy. Another study done in Singapore by Singh et al proposed that multiparous women were found to have highest risk of anaemia. The prevalence of anaemia is a woman having more than 4 children was found to be 75%.

In our study, only 42.3% of total women who had non-vegetarian diet had anaemia which is less as compared to 55.4% among vegetarian women. Similarly study by Huddle et al revealed the impact of diet on anaemic status

in Malawian women.⁵ They reported that plant-based food contributed to 89% of total dietary iron, flesh foods provided only 9% and 59% of women were found to be anaemic due to low intake of non-vegetarian food. The low status of woman in developing countries limits their access to economic resources and basic education and their ability to make decisions related to their health and nutrition. Lack of decision making power and alternative opportunities consigns many women to a life of repeated childbearing. Parity, thus has found to influence the prevalence of anaemia. Excessive physical work coupled with poor diet causes nutritional anaemia which in turn contributes to poor maternal outcomes.

CONCLUSION

The present study indicates that prevalence of nutritional anaemia is widely present in women from 15 to 45 years of age. Occupation and education have a direct effect on socio-economic status thus leading to nutritional anaemia. Very young age at marriage exerts indirect effect on nutritional status on women of child-bearing age, thus leading to anaemia. Fertility has been found to have a direct influence on anaemia. Less inter-pregnancy interval, repeated child bearing and early age of marriage affects long term nutritional status of the women, thus delaying her growth and development. Low socioeconomic status, educational background, unemployment, dietary pattern, strongly influences the prevalence of anaemia. Thus, Iron-folic supplementation is an important and effective measure to combat the problem of iron deficiency and will definitely prevent complications and morbidity if its administration is undertaken under close supervision and full community participation.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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