



FACTORS INFLUENCING ON THE HEMOGLOBIN LEVEL OF PREGNANT WOMEN-A CROSS SECTIONAL STUDY IN RURAL AREA OF LATUR DISTRICT.

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ABSTRACT

Background: Anaemia is a global public health problem, affecting both developing and developed countries. WHO estimates that prevalence of anaemia as 65-75% in India. Most common form of anaemia in pregnant women is iron deficiency anaemia. The etiology of anaemia during pregnancy among women in developing countries is multifactorial. Hence this study was done to assess factors affecting haemoglobin level in pregnant women in rural area. **Objectives :** To study the prevalence of anaemia among pregnant women and various sociodemographic, dietary and obstetric factors associated with anaemia in pregnant women in rural area. **Methods:** A community based cross sectional study was done in rural blocks of Latur district. Sociodemographic, obstetric and dietary data was collected from pregnant women. Hemoglobin was calculated by Sahli's method and classified according to the WHO classification for pregnant women. Chi square test and crude Odds ratio were estimated. $p < 0.05$ considered as significant. **Results:** Mean age of study subjects was 22.34 ± 0.498 years. Prevalence of anaemia was 62%. Mild, moderate and severe anaemia contributed 30%, 29% and 3% respectively. A statistical significant association was seen between anaemia and religion (Muslim COR-2.98 and Buddhist COR- 5.81) and Socioeconomic class (COR-3.19). Also, anaemia was significantly associated with age at menarche, gestational age, average spacing, IFA consumption and deworming status during pregnancy. ($p < 0.05$) Prevalence of anaemia was significantly high among vegetarians, pregnant women with deficient daily calories and protein intake and lack of daily Green leafy vegetables and fruits consumption. ($p < 0.05$) **Conclusion:** Anemia continues to be a public health problem. Although iron-folic acid supplementation is available under the national health program to address this issue, it is important for primary care physicians to consider and address other risk factors when designing and implementing target interventions for anemia control in selected populations.

KEYWORDS :

BACKGROUND

Anaemia is a global public health problem, affecting both developing and developed countries. Nutritional anaemia is a condition in which haemoglobin content of blood is lower than the normal as a result of a deficiency of one or more essential nutrients, regardless of the cause of such deficiency¹. As defined by WHO anaemia in pregnancy develops when haemoglobin concentration of blood reduces to less than 11g/dL with haematocrit of less than 0.33/L.²

WHO estimates that prevalence of anaemia is 14% in developed countries, 51% in developing countries and 65-75% in India.³ Global data shows that anaemia in pregnancy among low and middle income countries can be as high as 56%.⁴ with continental variations; sub-Saharan Africa shows 57% prevalence, South-East Asia 48%, and South America at 24.1%.⁵

India contributes to about 80% maternal deaths in South Asia as estimated by WHO.⁶ Most common form of anaemia in pregnant women is iron deficiency anaemia. As per study by Shrilatha J in Hyderabad, prevalence of anaemia among pregnant women is 57%.⁷

Anaemia in pregnancy is associated with increased maternal mortality and morbidity. 16% maternal deaths are attributed to anaemia. Anaemia may worsen by postpartum hemorrhage and anaemic patients are predisposed to puerperal infections. Both anaemia and puerperal infections are leading causes of maternal mortality in developing countries. Anaemia is also associated with adverse fetal outcomes like preterm delivery, Low birth weight, low apgar score at birth, and birth hypoxia.⁷

developing countries is multifactorial. Various sociodemographic factors like age, parity, socioeconomic status, level of education, dietary pattern, and religion are associated with anaemia. There is increased risk of anaemia in illiterate women as compared to educated women.⁸ Certain dietary habits like eating junk food, tea or coffee post meal are associated with increased risk of anaemia. Anaemia is more common in vegetarians than non-vegetarians and among vegetarians more common with predominantly rice based diet.⁹

There are several contributors to the development of anaemia in pregnancy in low-income countries which may include nutritional deficiencies of iron, folate, vitamins A and B12; parasitic infections or chronic infections with Tuberculosis and HIV.^{10,11} These factors contribute to varying degrees in the development and progress of anaemia in pregnancy but low iron intake is seen as the leading cause of anemia in pregnancy.¹²

This study was done to study factors affecting haemoglobin level in pregnant women in rural field practice area.

AIM AND OBJECTIVES

AIM :

To study factors affecting haemoglobin level in pregnant women in rural area of Latur district.

OBJECTIVES:

- 1) To study the prevalence of anaemia among pregnant women in rural area.
- 2) To study sociodemographic, dietary and obstetric factors associated with anaemia in pregnant women.

MATERIAL AND METHODS

The etiology of anaemia during pregnancy among women in

This was a Community Based Cross Sectional study among 100 Pregnant women during the study period of 6 months irrespective of gestational age. in Rural Latur block. RHTC serves population of 30000. total population is divided into 15 wards .Out of 15 wards 6 wards were randomly selected by lottery method ..House to house survey was done in these 6 wards periodically and participants were enrolled consecutively till desired sample size was achieved. The data collected was entered in Microsoft excel and analyzed using SPSS software. Mean, standard deviation and percentages were estimated. Associations between sociodemographic, dietary and obstetric factors and anaemia were studied by chi square test. Independent sample t test was used to compare means of two samples. P<0.05 was considered significant.

Inclusion criteria-

Pregnant women in rural area during the study period irrespective of gestational age.

Exclusion criteria-

- 1) Pregnant women not willing to participate in the study.
- 2) Pregnant women with h/o any major surgery, recent blood transfusion, on immunosuppressive therapy and with known chronic medical conditions like malignancies, haemoglobinopathies and renal diseases.

Ethical clearance was obtained from institutional ethics committee. Eligible pregnant women from these selected localities were enrolled through house to house visit till desired sample size was achieved. Once the subject satisfied inclusion criteria, was explained in detail about study procedure, in language she understands. Written consent was obtained from the study participant.

Pre tested questionnaire was used as a tool for data collection. The questionnaire included identification data of study subjects, sociodemographic profile and detail dietary history. Literacy status and occupation of the subjects was determined as per Kuppuswamy scale.¹³ Socioeconomic status was decided by Modified BG Prasad classification.¹⁴ Obstetric parameters like age at menarche, gestational age¹⁵ and gravid status¹⁵ were recorded.

WHO criteria for Anaemia in pregnant women¹⁶

- No Anaemia - Hemoglobin more than 11 gm/dl
- Mild anaemia - Hemoglobin 10 to 10.9 g/dl
- Moderate anaemia - Hemoglobin 7 to 9.9 g/dl
- Severe anaemia --Hemoglobin less than 7 g/dl

Data Analysis

The data collected was entered in Microsoft excel and analyzed using SPSS software. Mean, standard deviation and percentages were estimated. Associations between sociodemographic, dietary and obstetric factors and anaemia were studied by chi square test. Independent sample t test was used to compare means of two samples. P<0.05 was considered significant.

RESULTS AND OBSERVATIONS

Mean age of study subjects was 22.34 ± 0.498 years. Most of subjects were belonging from > 20 yrs of age.(84%).Majority of participants were Muslims (58%) followed by Hindu (27%) and Buddhists (15%).Most of the study subjects were housewives (84%) from joint families (62%), educated upto ≥ High school level (72%) and belonging to lower Socioeconomic class (75%). [Table 1].

Prevalence of anaemia was 62%. Mild, moderate and severe anaemia contributed 30%,29% and 3% respectively. Mean Hb of study subjects was 10.488 ±0.309 gm%. [Fig no. 1] A statistical significant association was seen between anaemia and religion (Muslim COR-2.98 and Buddhist COR- 5.81) and Socioeconomic class (COR-3.19).[Table No.2]

Association between anaemia and obstetric factors was studied in present study It was observed that, anaemia was significantly associated with age at menarche ≤ 13 years Vs > 13 yrs (69.84% Vs 48.64%) gestational age of III rd trimester Vs I st trimester (70.83% Vs 43.33%), average spacing ≤ 3 Yrs Vs > 3 yrs (72% Vs 25%) , IFA consumption No Vs yes (91.66% Vs 58.69%) and deworming status No Vs yes (89.47 % Vs 62.74%) during pregnancy. (p<0.05) [Table No.3]

Prevalence of anaemia was significantly high among vegetarians (76.92%), pregnant women with deficient daily calories (82.5%) and protein intake (75%) and lack of daily Green leafy vegetables (72.5%) and fruits consumption.(76.81) (p<0.05)[Table No.4]

Table No.1 : Socio-demographic characteristics of study participants (N=100)

Variable	Subgroup	Frequency	Percentage
Age(Yrs)	≤20	16	16
	>20	84	84
Religion	Hindu	27	27
	Muslim	58	58
	Buddhist	15	15
Occupation	House wife	84	84
	Working	16	16
Type of family	Nuclear	24	24
	Joint	62	62
	Three generation	14	14
Education	≥ High school	72	72
	< high school	28	28
SES	Upper class (I,II)	25	25
	Lower class (III,IV,V)	75	75

Grades of anaemia

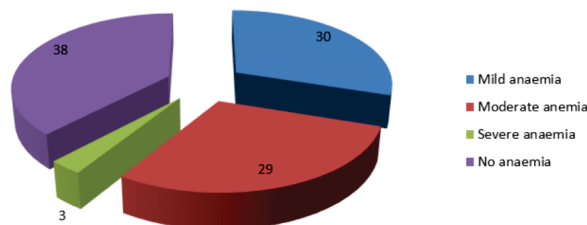


Figure No.1 : Grades of anemia among the pregnant women (N=100)

Prevalence of anemia among the pregnant women was 62%. Mild, moderate and severe anaemia contributed 30%,29% and 3% respectively

Table No.2: Association of anemia with socio-demographic factors (N=100)

Variable	Subgroup	Anaemic (N=68)	Non anaemic (N=32)	COR	P	95% CI
Age (Yrs)	>20	51	33	1		[0.439 , 4.341]
	≤20	11	5	1.38	0.29	
Religion	Hindu	11	16	1		
	Muslim	39	19	2.98	0.011	[1.162 , 7.669]
	Buddhist	12	3	5.81	0.009	[1.325 , 25.555]
Occupation	House wife	54	30	1		
	Working	8	8	0.55	0.142	[0.189 , 1.631]
Type of family	Nuclear	14	10	1		

	Joint	39	23	1.21	0.348	[0.463 , 3.167]
	Three generation	9	5	1.28	0.358	[0.330 , 5.017]
Education	≥ High school	46	26	1		
	< high school	16	12	0.75	0.266	[0.310 , 1.835]
SES	Upper class (I,II)	12	13	1		
	Lower class (III,IV,V)	56	19	3.19	0.007	[1.245 , 8.186]

Table No.3: Obstetric factors associated with anaemia among pregnant women (N= 100)

Variable	Subgroup	Anaemic (N=62)	Non anaemic (N=38)	P
Age at menarche	≤ 13 Yrs	44(69.84)	19(30.15)	.035*
	> 13 yrs	18(48.64)	19(51.35)	
Trimester	I st	13(43.33)	17(56.66)	.041*
	II nd	32(69.56)	14(30.43)	
	III rd	17(70.83)	7(29.16)	
Gravid status	Primi	41(65.07)	22(34.92)	.407
	Multi	21(56.75)	16(43.24)	
Average Spacing (n=37)	<3 yrs	18(72)	7(28)	.018*
	>3 yrs	3(25)	9(75)	
IFA consumption (n=70)	Yes	27(58.69)	19(41.30)	.004*
	No	22(91.66)	2(8.33)	
Albendazole (n=70)	Yes	32(62.74)	19(37.25)	.029*
	No	17(89.47)	2(10.52)	

P* = Significant, Chi square test

Table No.4 : Dietary factors associated with anaemia among pregnant women (N= 100)

Variable	Subgroup	Anaemic (N=62)	Non anaemic (N=38)	P
Type of diet	Vegetarian	40(76.92)	12(23.08)	.001*
	Mixed	22(45.83)	26(54.16)	
Daily Green Leafy Vegetables	≤ 1 time	29(72.5)	11(27.5)	.077
	≥ 2 time	33(55)	27(45)	
Daily Fruits consumption	Yes	9(29.03)	22(70.96)	< .00001*
	No	53(76.81)	16(23.18)	
Dairy products	Yes	37(68.51)	17(31.49)	.925
	No	25(54.34)	21(45.65)	
Daily Calories intake	Sufficient	29(48.33)	31(51.67)	.0005*
	Deficient	33(82.5)	07(17.5)	
Daily Protein Intake	Sufficient	32(53.33)	28(46.67)	.028*
	Deficient	30(75)	10(25)	

P* = Significant, Chi square test

DISCUSSION

This cross sectional study was done in rural area to asses factors affecting anaemia among pregnant women. Overall prevalence of anaemia among pregnant women in present study was 62%. Mild, moderate and severe anaemia contributed 30%,29% and 3% respectively [Fig No.1] A similar study by **Srilatha J (2017)**⁷ at Hyderabad revealed that, the prevalence of anemia among the pregnant women in study population was around 57%. Findings of these studies were consistent with present study. A study was done in Maharashtra by **Lokare PO et al (2012)**¹⁷ shown high prevalence of anemia among the pregnant women (87.21%) in contrast to present study. A study by **Grover K et al (2020)**¹⁸ revealed that mild, moderate and severe anaemia in 80 (19.6%), 244 (59.8%) and 24 (5.9%), respectively.

Mean age of study subjects was 22.34 ± 0.498 years. Most of subjects were belonging from > 20 yrs of age. (84%). A study by **Shwetha and Prasad (2019)**¹⁹ was done among 300 subjects. It was seen that most of subjects were in the age group of 21–35 years with mean age 24.4 ± 4.2 years.

Majority of participants were Muslims (58%) followed by Hindu (27%) and Buddhists (15%).Most of the study subjects were housewives (84%) from joint families (62%), educated upto ≥ High school level (72%) and belonging to lower Socioeconomic class (75%).[Table No.1] High prevalence of anaemia was seen among Muslim (COR -2.98) and Buddhist (COR-5.81) .[Table No.2] This might be due to less affordability of these religion resulting in deficiency of iron.Similar findings were seen in study by **Lokare PO et al (2012)**¹⁷.Low socioeconomic class was associated with anaemia in current study.[COR-3.19].A study by **A Viveki et al (2012)**²⁰ shown consistent findings with current study.

Association between anaemia and obstetric factors was studied in present study It was observed that, anaemia was significantly associated with age at menarche ≤ 13 years Vs > 13 yrs (69.84% Vs 48.64%). A descriptive study done by **Mohite RV et al (2013)**²¹ in Western Maharashtra shown similar findings. High prevalence of anemia in third trimester (III rd trimester Vs I st trimester) (70.83% Vs 43.33%) was seen. This might be due to hemodilution. Average spacing ≤ 3 Yrs lead to anemia in present study (≤ 3 Yrs Vs > 3 yrs) (72% Vs 25%) . Similar finding were seen in study by **Swarnlatha N (2012)**.²² No IFA consumption during pregnancy was associated with anaemia(. No Vs yes) (91.66% Vs 58.69%). A study done by **Singh K et al (1997)**²³ revealed that there was significant association between prophylactic iron supplementation during pregnancy and anaemia. and deworming status No Vs yes (89.47 % Vs 62.74%) pregnancy. (p<0.05) [Table No.3]

Prevalence of anemia was significantly high among vegetarians (76.92%), pregnant women with deficient daily calories (82.5%) and protein intake (75%) and lack of daily Green leafy vegetables (72.5%) and fruits consumption.(76.81) (p<0.05)[Table No.4]. In a similar study by **Mistry R et al (2018)**²⁴ it was observed that consumption of green leafy vegetables (OR = 0.6; 95%CI = 0.4, 0.9) were independently associated with IDA.Another study by **Baig-Ansari N et al (2008)**²⁵ revealed that consumption of fruit two or more times per week was associated with a decreased risk of anemia. Findings of present study are in line with these studies.

CONCLUSION

Our study findings suggest that anemia continues to be a public health problem. Although iron-folic acid supplementation is available under the national health program to address this issue, it is important for primary care physicians to consider and address other risk factors when designing and implementing target interventions for anemia control in selected populations.

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