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"PREVALENCE OF ANAEMIA AND FACTORS AFFECTING PREVALENCE OF ANAEMIA AMONG PREGNANT WOMEN PRESENTING IN LABOUR AT TERTIARY CARE HOSPITAL: A CROSS SECTIONAL STUDY"

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Abstract

Background: Pregnancy inducing accounts for one fifth of maternal deaths worldwide and is a one of leading cause for low birth weight. Anaemia accounts for 16% of maternal deaths in India. In India despite of effective and expensive preventive and therapeutic measures, the prevalence of anaemia among pregnant women remains high. There for the knowledge of the socio-demographic factors, obstetrics factors and antenatal factors associated with anaemia will help to formulate multi-pronged strategies to attack this important public health problem in pregnancy.

Objectives: The objectives of this study were 1.To estimate the prevalence of anaemia in women presenting in labour 2. To identify socio-demographic and obstetric factors associated with anaemia in late pregnancy. 3. To evaluate role of antenatal care factor in anaemia among pregnant mother.

Methodology: The Prospective longitudinal study was carried out at Obstetrics & Gyaecology Department of tertiary care Hospital, for the period of one year. Total 400 pregnant mothers presenting with labour are enrolled as study participants. Appropriate statistical test was applied when needed.

Results: Overall prevalence of anemia among the pregnant women was 76.25% of this 54.25% were moderate-very severe anemia. Factors such as lower socio-economic status (89.74%), poor educational status (85.51%), rural area of residence (81.12%), lower age at first childbirth ,higher parity (>3 children- 88.37%), late trimester at booking visit (At T3-88.68%) and lack of treatment with haematinics were found to be significantly associated with the prevalence of anemia in pregnancy.

Conclusions: The prevalence of anaemia is higher among pregnant mother presenting at late trimester of pregnancy. Various socio-demographic, obstetrics and antenatal factors such as low socio-economic status, poor education, rural residence, early age at first childbirth, high parity,

booking in late trimester and lack of oral iron prophylaxis are associated with presence and severity of anaemia among pregnant women.

Keywords: Anaemia, Pregnant women, Presenting with Labour.

Introduction:

Anaemia in pregnant women is a major health problem worldwide. It is condition in which the blood's ability to carry oxygen throughout the body is impaired when the number and size of red blood cells or the concentration of hemoglobin fall below a predetermined threshold.

According to data published by WHO, the global prevalence of anaemia among women of childbearing age is 29.4% and overall prevalence during pregnancy is 38.2%.[1] Anaemia also contributes to 591,000 perinatal deaths and 115000 maternal deaths globally as estimation done by WHO in 2004. [2] WHO estimate that even among South Asian countries, India has the highest prevalence of anaemia during pregnancy. About half of maternal deaths from anaemia globally occur in South Asian countries and India contributes 80% of these deaths. [3]

As per National Family Health Survey-5 in India, 57.2% of non-pregnant women were anaemic while 52.2% of pregnant women were anaemic which shows slight increase over NFHS-4.[4] While in Gujarat more than half (65.1%) of non-pregnant women and 62.6% of pregnant women aged 15-49 years of age are anaemic.[5]

Anaemia affects all age groups starting from puberty and adolescence to perimenopausal age. Due to a high prevalence of anaemia among all phases of reproductive age, iron levels and iron stores are already low at the time of conception in Indian women.[6] It is also known that anemia is the cause of several complications in mother and the fetus. It is known to be associated with low birth weight, premature birth, intrauterine growth retardation and increased perinatal mortality.[7]

Only dietary intake of iron is insufficient to take care of increased requirement of iron during pregnancy. To tackle the anaemia India has implemented National Nutritional Anaemia Control Program since 1970. As per national programme pregnant and lactating women should consume 100 mg elemental iron and 500 μg folic acid daily for at least 100 days but despite of wide distribution and receipt, the intake of the IFA supplement remains low. [8] Poor compliance of IFA may be due to gastrointestinal side-effects side-effects and its unacceptable metallic taste.

A good antenatal care should be able to identify factors like poor adherence to oral iron, detect anaemia not responding to oral iron and institute appropriate therapy to correct anaemia before reaching term pregnancy. Many unbooked, underprivileged women report with anaemia late in pregnancy when they are already in labour. These make timely interventions difficult to correct anaemia and improve maternal an fetal outcome. So it is necessary not only to prevent the anaemia at the health care worker level but, also to address the socio-economic and cultural factors associated with it.[9,10] Uncorrected anaemia at the time of delivery predisposes women to higher chance of maternal mortality and morbidity. It decreases the woman's reserve to tolerate bleeding either during or after child birth and makes prone to infections.[11]

Very few studies have published in India which addressed the role of socio-demographic factors, obstetrics factors and antenatal care factors in anaemia among women in late pregnancy or presenting in labour.

So, this study is designed to find the prevalence of anaemia in women presenting with labour and to evaluate the role socio-demographic, obstetric and antenatal care factors associated with respect to severity of anaemia at the time of presentation in labour. So the knowledge gained may help to provide the interventions at various levels for reducing the prevalence of anaemia.

Methodology:
A Prospective longitudinal study carried out at the department of Obstetrics and Gynaecology, at a tertiary care hospital among pregnant women presenting with labour from January-2021 till December-2021.

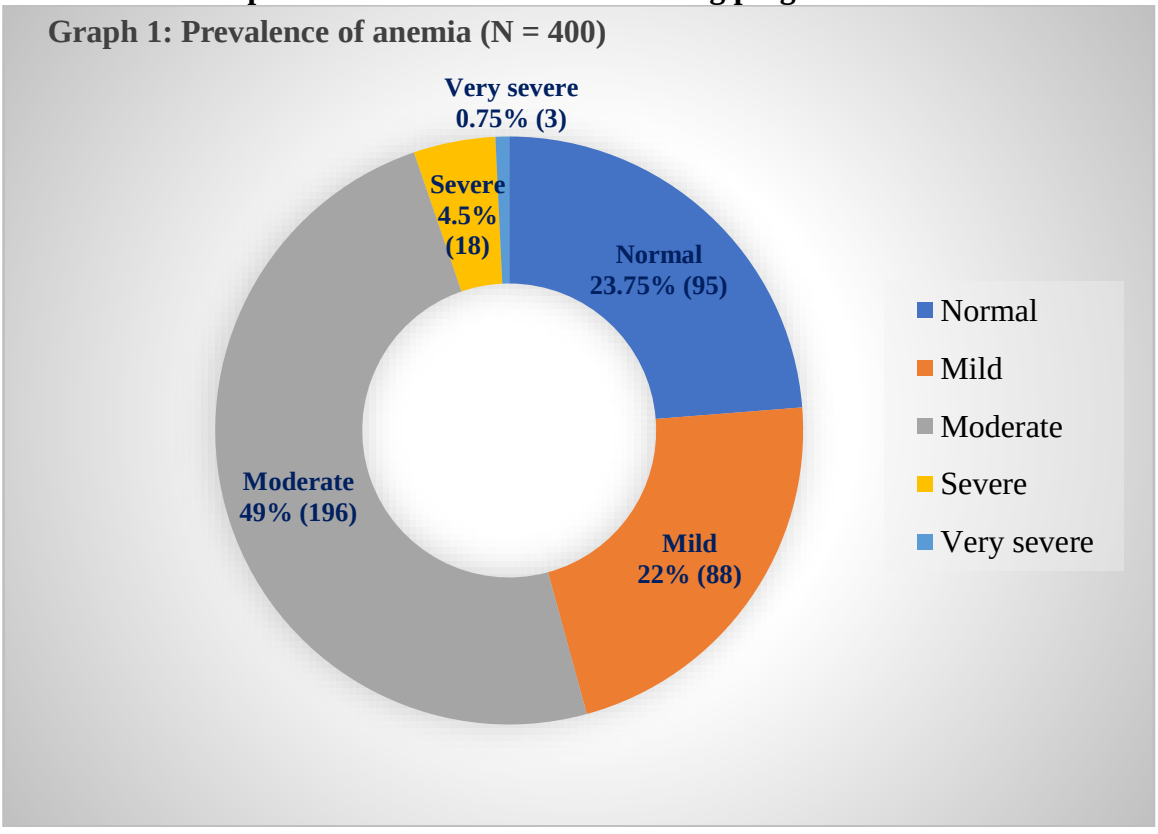
Sample Size
Minimum sample size required for the study was calculated at 5% relative precision with 95% confidence interval using.. $N= Z^2 X P (1-P)/ E^2$.
Here N is estimated minimum sample size; Z is confidence level at 95% (standard value is 1.96), P is prevalence, E is precision at 95% Confidence Interval = 0.05.
Based on the NFHS-4 data the approximate prevalence of anaemia was taken ~ 60%.[5] the minimum sample required for this study was ~ 369 pregnant women.
To further improve precision, a sample size of 400 women was taken for the study with following inclusion and exclusion criteria.

InclusionCriteria
Pregnant women presenting in labour having age 18 – 45 years and willing to participate were included in this study.

Exclusion Criteria
Pregnant women with known haematological disease or chronic systemic medical illness like SLE, Rhematoid arthritis, TB, HIV etc., or Hemodynamically unstable patient or Antepartum haemorrhage are excluded from study.
Data was entered in MS excel 2010 and analysed by appropriate statistical software. Appropriate statistical test applied when needed.

Result:

Graph:1 Prevalence of anaemia among pregnant mother



Here we use the classification of anaemia recommended by ICMR Expert group, they classified anaemia in pregnancy into mild anaemia 10-10.9 g/dl, moderate anaemia 7-9.9 g/dl, severe 4-6.9 g/dl and very severe <4 g/dl.[12]

Table 1: A distribution of various socio-demographic factors among anaemic and non-anaemic pregnant mothers.

Socio-demographic characteristics	Anaemia No. (%)			No Anaemia (D)	P Value	
	Mild (A) N= 88	Moderate-Very Severe (B) N= 217	Total C=(A+B) N= 305	No. (%) N=95	B vs D	C vs D
AGE (Years)						
< 20	1 (9.09)	5 (45.45)	6 (54.54)	5 (45.45)		
20-24	38 (24.05)	78 (49.37)	116 (73.42)	42 (26.58)		
25-29	33 (21.43)	92 (59.74)	125 (81.17)	29 (18.83)		
30-34	16 (25.81)	29 (46.77)	45 (72.58)	17 (27.42)	0.12	0.19
35-39	0	10(83.33)	10 (83.33)	2 (16.67)		
>= 40	0	3 (100.0)	3 (100.0)	00		
Educational status						
Cannot read / write	12 (17.39)	47 (68.12)	59 (85.51)	10 (14.49)		
Can read and / or write	29 (24.37)	70 (58.82)	99 (83.19)	20 (16.81)		
Primary	19 (19.79)	51 (53.13)	70 (72.92)	26 (27.08)	0.003*	0.01*
Secondary	15 (21.74)	30 (43.48)	45 (65.22)	24 (34.78)		
College and higher	13 (27.66)	19 (40.42)	31 (68.08)	15 (31.92)		
OCCUPATION						
Homemaker	69 (21.30)	179 (55.25)	248 (76.54)	76 (23.46)		
Government employee	7 (24.13)	13 (44.83)	20 (68.96)	9 (31.04)	0.67	0.79
Corporate Employee	2 (13.33)	10 (66.67)	12 (80.00)	3. (20.00))		
Self Employee	10 (31.25)	15 (46.88)	25 (78.13)	7 (21.87)		
RELIGION						
Hindu	68 (21.79)	170 (54.49)	238 (76.28)	74 (23.72)	0.93	0.54
Muslim	20 (22.73)	47 (53.41)	67 (76.14)	21 (23.86)		
CAST						
General	49 (23.33)	104 (49.52)	153 (72.85)	57 (27.15)		
OBC	15 (15.96)	62 (65.96)	77 (81.92)	17 (18.08)	0.06	0.23
SC/ST	13 (24.49)	29 (56.86)	42 (82.35)	9 (17.65)		
Unknown	11 (24.44)	22 (48.89)	33 (73.33)	12 (26.67)		
SOCIO-ECONOMIC CLASS						
Lower	8 (20.51)	27 (69.23)	35 (89.74)	4 (10.26)		
Upper-lower	37 (23.27)	92 (57.86)	129 (81.13)	30 (18.87)	0.001*	0.01*
Lower-middle	34 (20.86)	83 (50.92)	117 (71.78)	46 (28.22)		
Upper-middle	9 (23.08)	15 (38.46)	24 (61.54)	15 (38.46)		
Upper	00	00	00	00		
RESIDENCE						
Urban	47 (23.04)	99 (48.53)	146 (71.57)	58 (28.43)	0.01*	0.01*
Rural	41 (20.92)	118 (60.20)	159 (81.12)	37 (18.88)		

Table -1 shows the social-demographic distribution of pregnant mothers We noted that In age group 20-24 years 116 (73.42%) of mothers were anaemic of this 24.05% were mild anaemic and 49.37% were moderate-severely anaemic. In 25-29 years of age group 81.17% mothers were anaemic mothers were so anemia was almost equally prevalent in all age groups, this deference was statistically non significant. Similarly relationship of socio-demographic factors such as occupation, religion and cast with the anaemia were statistically non-significant. Uneducated pregnant mothers (85.51%) were anaemic, while (68.12%) were moderate - severe anaemia and this difference was statistically significant. Similarly mother belongs to lower and upper lower classes are more anaemic (89.74% and 81.13%) than other classes, similarly mother belongs to rural residency more anaemic (anaemia- 81.12% and moderate to sever anaemia-60.20%) then urban residency and this difference was statistically significant.

Table:-2 A distribution of obstetric characteristics between anaemic and non-anaemic pregnant mothers

Obstetrics Characteristics	Anaemia No. (%)			No Anaemia (C)	P Value	
	Mild (A) N= 88	Moderate-Very Severe (B) N= 217	Total N= 305	No. (%) N=95	B vs D	C vs D
Age at first child (In years)						
< 18	00	3 (100)	3 (100.0)	00		
18-21	41(23.03)	108 (60.67)	149 (83.70)	29 (16.30)		
22-25	32 (18.71)	87 (50.88)	119 (69.59)	52 (30.41)	0.006*	0.01*
26-30	14 (29.79)	19 (40.43)	33 (70.22)	14 (29.78)		
> 30	1 (100)	00	1 (100.0)	00		
Parity						
0	36 (27.91)	50 (38.76)	86 (66.67)	43 (33.33)		
1	34 (22.08)	85 (55.19)	119 (77.27)	35 (22.73)	<0.001**	0.01*
2	14 (18.92)	48 (64.86)	62 (83.78)	12 (16.22)		
≥ 3	4 (9.30)	34 (79.07)	38 (88.37)	5 (11.63)		
Interval from last pregnancy (In months) (N=271)						
<12	8 (20.00)	28 (70.00)	36 (90.0)	4 (10.0)		
12-36	23 (19.49)	74 (62.71)	97 (82.20)	21 (17.80)		
>36	21 (18.58)	65 (57.52)	86 (76.10)	27 (23.90)	0.14	0.14

Table- 2 shows that first three parameters are known to be associated with anaemia in pregnancy and we noted the inverse relationship between the age at first pregnancy, prevalence and severity of anemia which showed significant decrease with increase in the age at first pregnancy. All pregnant women less than 18 years of age were anaemic. Parity also associated with the severity of anemia. (≥ 3 para 88.37% anaemic of this 79.07% were moderate-very severe anaemic) these difference was statistically significant.

Table-3 A relationship between antenatal care factors among anaemic and non-anaemic pregnant mother

Various Antenatal factors	Anaemia No. (%)			No Anaemia (C)	P Value	
	Mild (A) N= 88	Moderate-Very Severe (B) N= 217	Total N= 305	No. (%) N=95	B vs D	C vs D
No. Of Antenatal visit						
0	7 (24.14)	19 (65.52)	26 (89.66)	3 (10.34)		
1	8 (22.86)	22 (62.66)	30 (85.72)	5 (14.28)	0.2	0.11
2	16 (24.24)	35 (53.3)	51 (77.27)	15 (22.73)		
>3	57 (21.11)	141 (52.22)	198 (73.33)	72 (26.77)		
Trimester at First ANC Visit						
T1	41 (24.70)	72 (43.37)	166 (68.07)	53 (31.93)		
T2	30 (19.74)	89 (58.55)	152 (78.29	33 (21.71)		
T3	10 (18.87)	37 (69.81)	53 (88.68)	6 (11.32)	0.001*	0.01*
Presenting directly in Labour	7 (24.14)	19 (65.52)	29 (89.66)	3 (10.34)		
H\o treatment with Haematinics						
Routine prophylaxis	32 (38.09)	16 (19.05)	48 (57.14)	36 (42.86)		
Oral iron treatment dose	24 (37.50)	14 (21.88)	38 (59.38)	26 (40.62)		
IV iron	7 (25.92)	5 (18.52)	12 (44.44)	15 (55.55)	<0.001	0.01*
Blood transfusion	2 (100)	00	2 (40.0)	3 (60.0)	*	
None	23 (10.45)	182 (82.73)	205 (93.18)	15 (6.82)		
History of Deworming						
Yes	37 (24.34)	94 (61.84)	131 (86.18)	21 (13.82)	0.001*	0.01*
No	51 (20.56)	123 (49.60)	174 (70.16)	74 (29.84)		

Table 3 shows the distribution of pregnant mother as per various antenatal factors and anaemia and noted that among mother had no any antenatal visit 89.66% were anaemic, while among those >3 antenatal visit 73.33% mother were anemic. Table-3 also shows that earlier the antenatal visit lesser

the anaemia among pregnant mother (ANC visit in first trimester -68.07%, presenting directly in labour- 89.66% were anemic) and this difference was statistically significant for anemic and moderate- very sever anemic mother. Total 220 mother were not received any kind of haematinics during pregnancy of this 93.18% were anemic (82.73% were moderate-severe & 10.45% were mild anemic). The relation haematinic among moderate-sever and total anaemia is found the statistically significant as compare to non-anaemic. We also noted that higher number of anemic mother had history of deworming 131 (86.18%) and this difference was satistically significant for both moderate-sever and total anaemia.

Discussion:

In 2011, the WHO South-East Asia, Eastern Mediterranean and African Regions the prevalence of anaemia was 37.7% to 41.5% for non-pregnant women and 38.9% to 48.7% for pregnant women.[1] Looking at Southeast Asia, India is the country with the highest burden of anaemia among pregnant women, and the condition is worsening in some rural areas. Variability in prevalence across regions may be due to difference in socio-cultural, economic and geographical conditions.

In our study the prevalence of anaemia among pregnant mother presenting with labour was 76.25%. Of this 49.00% had moderate anaemia, 22.00% had mild anaemia, 4.5% and 0.75% had Severe and Very severe anaemia respectively.

Similarly Very high prevalence of anaemia (70.00%) was noted by Neelam Goyal et al in their study.[13] Pushpa O. Lokare et al in their study the prevalence of anemia among pregnant women was 87.2% of this mild, moderate, severe anemia were observed as 24.7%, 54.5%, and 7.9%, respectively.[14]

Study conducted by SM Mathur et al at tertiary care health institute, Jaipur noted the 64.71% of prevalence of anemia among pregnant mother of this 29.50% were mild anaemic, 34.56% were moderately anaemic, 0.65% were severely anaemic and no one is of very severly anaemic.[15]

In community based study in Kolar district among pregnant mother noted the prevalence of anaemia was 62.3%.[16] In a study of pregnant women in an urban area of Eastern Ethiopia 56.8% respondent were anaemic, of which 1.2% had sever anaemia, 26.7% had smoderate anaemia AND 28.9% had mild anaemia.[17]Anthony Wemakor found that the proportion of women with ananemia increased as the pregnancy progressed, 32.2% in first trimester, 53.7% in second trimester and 77.5% in third trimester.[18]

In Present study We noted that in 25-29 years of age group 81.17% mothers were anaemic in 20-24 years (73.42%) of mothers were anaemic, so anemia was highly prevalent in all age groups. The relationship of socio-demographic factors such as age of mother, occupation, religion and cast with the anaemia were statistically non-significant. In Contrast to our study SM Mathur et al in their study noted the relationship of anaemia with age, religion were statistically significant.[15]

In our study 85.51% uneducated pregnant mothers were anaemic, of this 68.12% were moderate – Very severely anaemia and this difference were statistically significant. Mother belongs to lower and upper lower classes are more anaemic (89.74% and 81.13%) than other classes, similarly mother belongs to rural residency more anaemic (anaemia- 81.12% and moderate to severe anaemia-60.20%) then urban residency both this difference were statistically significant.

Mishu Mangal et al[7], Pushpa O. Lokare et al [14], Shah Ravi Kumar et al [19] found association between various socio demographic factors and the prevalence of anemia.

Neelam Goyal showed that Women who were literate were less likely to be anaemic compared to their counterparts. She reported education reduces the risk of anaemia. Educated women have better income and eat nutritious food and hence do not get anaemic.[13]

Ravishankar Suryanarayana et al in their study showed that anemia was higher in the age group of 21–30 years (66.1%), Schedule Cast, Schedule tribe (61.6%), and OBC (30.8%). Anaemia was significantly associated with educational status and gravida.[16]

We noted significant relationship between age at first pregnancy and prevalence and severity of anemia. All pregnant mothers were anaemic who had their first pregnancy before the age of 18 years. Parity of the pregnant female was also associated with the severity of anemia. (≥ 3 para 88.37% were anaemic, 79.07% were moderate-very severely anaemic) these difference was statistically significant with moderate- very severe anaemia and total anaemia.

Similarly Bisoi S et al showed that parity and the birth interval significantly affect anemia in pregnancy. A previous study showed that a birth interval of less than two years was a significant predictor of anemia.[20]

The prevalence of anemia increased with the duration of pregnancy and the difference was non-significant. Anemia is more common in the women with birth interval <1 year (40.2%) similar finding were observe in present study. [16]

In this study we noted that mother had no any antenatal visit (89.66%) were anaemic, while among those >3 antenatal visit 73.33% mother were anemic, earlier the antenatal visit lesser the anaemia among pregnant mother. Total 220 mother were not received any kind of haematinics during pregnancy of this 93.18% were anemic (82.73% were moderate- very severe & 10.45% were mild anemic) the difference between ANC visit, usage haematinics during pregnancy with prevalence of was statistically significant.

The number of ANC visits in pregnancy and Iron Folic acid prophylaxis also very significant variables in the determination of prevalence and severity of anemia. Mishu Mangla et al found that of Severe and very severe anemia higher among those pregnant women who had either not taken IFA prophylaxis or took it irregularly (100%) and pregnant women who had only 1 or 2 ANC visits (89.3%).[19]

Conclusion:

The prevalence of anaemia was higher among pregnant mother presenting with labour. Study reveal role of low socio-economic status, poor education, rural residence, early age at first childbirth, high parity, booking in late trimester, poor compliance with antenatal follow-up and oral iron prophylaxis have significant association with anaemia and severity of anaemia.

Recommendation:

Despite persistent efforts by the government, reduction in prevalence has been minimal so multisectoral interventions are needed to tackle anaemia and requires understanding of its determinants. A Pregnancy provides a great opportunity to identify women with anaemia so early screening for anaemia and giving proper, effective treatment and counseling about good antenatal care including iron prophylaxis to improve maternal and fetal outcome.

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