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Original Research Article

Prevalence and socio-demographic and obstetric factors for anaemia among pregnant women in second and third trimester in a tertiary hospital of Delhi

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ABSTRACT

Background: Anaemia during pregnancy continues to be a major public health problem especially in developing nations like India. The study was performed to assess the prevalence and severity of anaemia and the associated socio-demographic and obstetric factors during pregnancy in a tertiary referral hospital of Delhi, India.
Method: This cross sectional study was carried out on 430 pregnant women in second and third trimester of pregnancy using systematic random sampling attending antenatal clinic of Vardhman Mahavir Medical College and Safdarjung Hospital of Delhi. A predesigned and structured questionnaire proforma was used to collect information regarding socio-demographic and obstetric factors. Haemoglobin levels were estimated using Hemocue method. Statistical analysis was carried out using STATA version 18.0 statistical software.
Results: The overall prevalence of anaemia during pregnancy was 48.84% with 25.81% mild anaemia, 15.81% moderate anaemia, 6.98% severe anaemia and 0.24% very severe anaemia. Anaemia was found to be more common in younger women (<25 years) and in joint family. Anaemia was more commonly seen in low socio-economic status, low family income and in illiterate and primary education. Anaemia especially severe anaemia was more common in third gravidas and above. Anaemia was more common with advancing gestation. Anaemia was more common with no or irregular antenatal care and with no or single tetanus toxoid injection.
Conclusions: The prevalence of anaemia is high in Delhi. Regular and timely antenatal care, improving socio-economic status and having lesser children can reduce prevalence of anaemia during pregnancy.

Keywords: Anaemia, Pregnancy, Socio-demographic factors, Obstetric factors, Delhi, India

INTRODUCTION

As per World Health Organization (WHO), anaemia is the most common disease affecting more than 1.5 billion people worldwide.[1] Prevalence is very high in Africa, Asia, India, Latin America, Eastern Europe and China but is also high in developed countries.[1-2] The highest prevalence of anaemia is in 3 groups; children aged 2-5 years (46%), pregnant women (42%) and women of reproductive age group (30%). Iron deficiency anaemia accounts for 50% of cases and is the most common cause of anaemia.[1-3] National Family Health Survey-5 (NFHS-5) observed a high prevalence of anaemia (52%) during pregnancy in India.[3]

In pregnancy, a Hb concentration of less than 11 gm% or a haematocrit of less than 33% is taken as the definition of anaemia.[1,4] Anaemia is a significant health problem

globally with an overall prevalence of 38.2% of women affected worldwide being much more in developing countries than in developed nations.[5] Most cases of anaemia are due to nutritional deficiencies especially iron deficiency followed by folate and vitamin B12 deficiency.[6,7]

Anaemia during pregnancy has adverse maternal and perinatal outcomes in the form of premature birth, fetal growth restriction, decreased maternal reserves, cardiac stress, and decreased breast milk production. Hence, timely diagnosis and effective treatment of anaemia in pregnancy is of crucial importance for optimum maternal and perinatal outcomes.[4,8-11]

The prevalence of anaemia during pregnancy is about 14% in developed countries but is very high being 51% in developing countries varying from 65-75% in India in old studies.[1,2] However, recent NFHS-5 observed the prevalence of anaemia to be 57% in women between the ages of 15 and 49 years as compared to 53% in 2015-2016 and 52.2% in pregnant women as compared to 50.4% in 2015-2016.[3] This is in spite of Anaemia Mukt Bharat Programme which focuses on prophylactic iron and folic acid supplements, identification of anaemia cases and their referral and treatment apart from improving nutrition.[12]

The commonest etiology of anaemia in pregnancy is iron deficiency being responsible for 50-60% of cases. Iron deficiency is usually multifactorial and may include reduced iron availability due to insufficient dietary iron intake or poor absorption and or increased losses from vomiting or blood loss further compounded by increased iron demands during pregnancy.[4,10] Hence, it is usually challenging for pregnant women to maintain adequate iron stores during their pregnancy without iron supplements which is recommended for all pregnant women, especially in developing countries where the prevalence of anaemia in pregnancy is more than 40 percent making it a major public health problem.[11-13]

Iron supplementation is safe and cost-effective treatment for prevention and treatment of iron deficiency and iron deficiency anaemia in pregnancy.[12,13] Oral iron is the commonest first line treatment modality but may be associated with gastrointestinal side effects like constipation and abdominal pain causing poor compliance.[4,10] Parenteral iron in the form of intravenous iron sucrose or ferric carboxy-maltose is given for severe iron deficiency anaemia in patients unable to tolerate oral iron and if the gestation is advanced.[4,8,10]

The severity of anaemia in pregnancy is graded by WHO as mild if Hb is 9-11 gm/dl, moderate if Hb is between 7-9 gm/dl, severe if Hb is 4-7 gm/dl and very severe or decompensated if Hb is <4 gm/dl.[4,8]

This current study was carried out to observe the prevalence and severity of anaemia (as per WHO classification) and various contributing factors especially socio-demographic and obstetric factors causing anaemia, during second and third trimester of pregnancy.

METHODS

Study area

This study was conducted in Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi over 430 pregnant women attending antenatal clinic in second and third trimester of pregnancy. Most women were from Delhi.

Study design

It was a cross sectional study using systematic random sampling method from women attending antenatal clinic of the hospital.

Study participants

The study participants in this study were pregnant women attending antenatal clinic of Safdarjung Hospital, New Delhi from 1st January 2023 to 30th September 2023 and who resided in Delhi for more than six months. Pregnant women with comorbidities, medical disorders and obstetric complications were excluded from the study.

Sample size and sampling procedure

Taking the prevalence of anaemia during pregnancy in Delhi to be 42% as per National Family Health Survey-5 and using the formula for sample size calculation, a sample size of 430 women was taken.[3] The pregnant women in second and third trimester of pregnancy fulfilling inclusion criteria and after excluding exclusion criteria, systematic random sampling technique was used to select participants. About 5-8 antenatal cases were recruited per day in twice weekly antenatal clinics. The flow chart of patients' enrollment from antenatal clinic and methodology used is shown in Figure 1.

Data collection: technique and procedure

A preformed, semi-structured, self-administered proforma questionnaire was used with detailed information on socio-demographic profile, socio-economic status and obstetric details. All women were interviewed as per questionnaire in English and Hindi language. Informed written consent was taken in their own language from all women. Ethical clearance was obtained from Institutional Ethical Committee of Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, 'Vide no/IEC/ VMMC/SJH/Thesis/06/2022/CC-T1 dated 11th July 2022.

Specimen collection and processing

Haemoglobin (Hb) estimation was performed in all women using Hemocue method over venous blood drawn from patients. The reference values of Hb were categorized as

per WHO criteria as: normal (Hb 11 g/dl or more), mild anaemia (9-10.9 g/dl), moderate anaemia (7-8.9 g/dl), severe (4-6.9 g/dl) and very severe (<4 g/dl). Other blood tests were done as per protocol of the hospital.

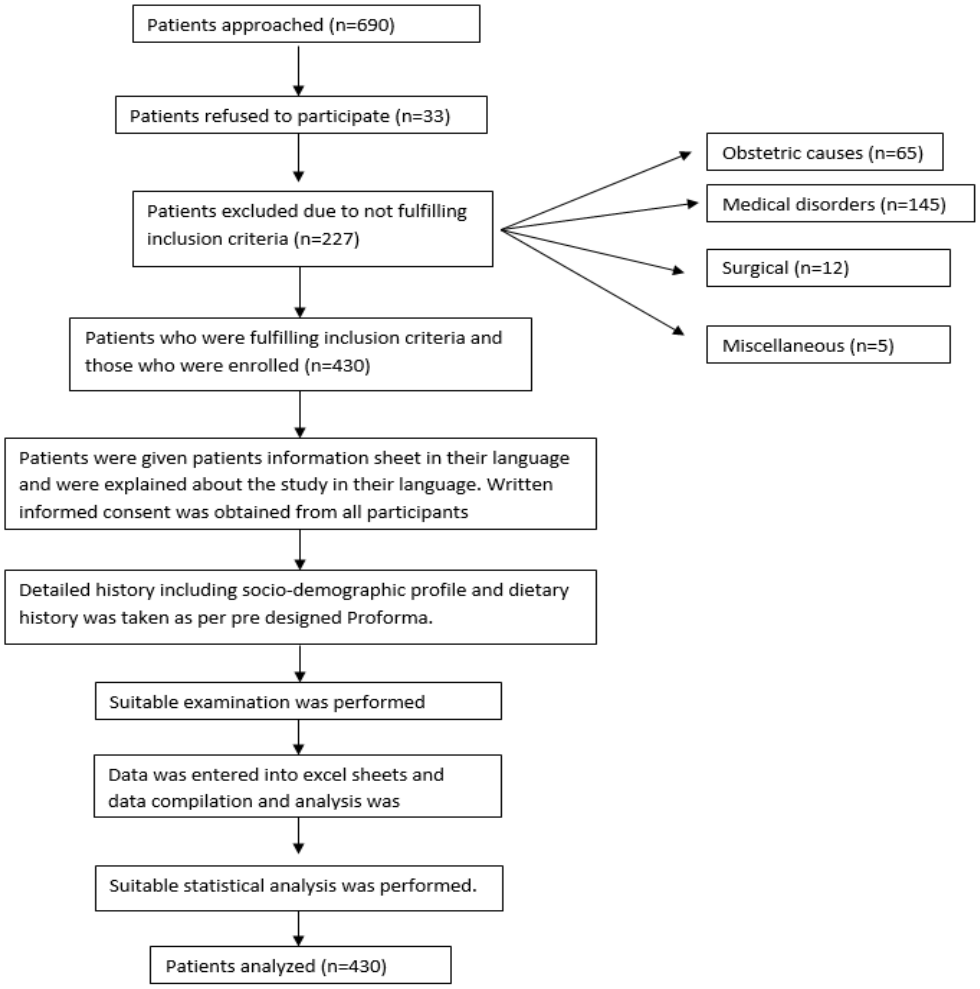

Figure 1: Patients' enrollment from antenatal clinic and methodology used.

Data analysis and statistical method used

Data was computerized using an Excel spreadsheet and the authenticity of the data was verified. Statistical analysis was carried out using STATA version 18.0 statistical software. Categorical data was presented as frequency and percentage values. The prevalence of anaemia was calculated as per the Indian standard and the association between anaemia and other factors was tested using the Chi-square/Fisher's exact test as appropriate. Continuous variables were tested for normality assumptions using the Kolmogorov-Smirnov test. For normally distributed data descriptive measures such as mean, standard deviation and range values were computed. Comparison of mean values was performed using the Students t-independent test or one- way analysis of variance test (ANOVA) as appropriate. Skewed data was presented as median and inter-quartile range values and compared using Mann-Whitney U-test or Kruskal Walis test as appropriate. For all the statistical tests, a two-sided probability of $p<0.05$ was considered for statistical significance.

RESULTS

Overall prevalence and severity

A total of 430 pregnant women in second and third trimester of pregnancy participated in the study. The overall prevalence and severity of anaemia is shown in Table 1. Out of total 430 participants, 210 (48.84%) were found to be anaemic with 111 (25.81%, 52.86% of anaemia group) having mild anaemia, 68 (15.81%, 32.38% of anaemia group) having moderate anaemia, 30 (6.98%, 14.29% of anaemia group) having severe anaemia while only one woman (0.24%, 0.47% of anaemia group) having very severe or decompensated anaemia.

Demographic feature

The prevalence and severity of anaemia as per demographic feature like age, type of family and religion is shown in Table 2. Age ranged from 18 to 43 years with mean being 26.2±4.5 years. Majority of women (331,

76.79%) were between 20 to 30 years with 172 (40%) being in 21 to 25 years while 159 (36.98%) were in 26 to 30 years age group. In the present study anaemia was found to be more common in young patients (<20 years) and in 21 to 25 years age group. Most women 333 (77.44%) lived in joint family, while 97 (22.56%) lived in nuclear family. Anaemia was found more commonly in joint family than in nuclear family in the present study. Majority (359, 83.49%) were Hindus followed by Muslims (69, 16.05%). There was no significant difference in prevalence of anaemia in different religions.

Table 1: Prevalence and severity of anaemia (n=430).

	Number	Percentage out of total (%)	Percentage out of anaemia group (%)
Normal Hb	220	51.16	-
Anaemia	210	48.84	-
Mild	111	25.81	52.86
Moderate	68	15.81	32.38
Severe	30	6.98	14.29
Very severe	1	0.24	0.47

Table 2: Prevalence and severity of anaemia as per age, type of family and religion.

All participants	Normal (n=220) N (%)	Mild (n=111) N (%)	Moderate (n=68) N (%)	Severe (n=31) N (%)	Anaemia (n=210) N (%)	Total (n=430) N (%)	P value	Significance
Age (years)								
<20	8 (3.64)	12 (10.81)	5 (7.35)	5 (16.13)	22 (10.48)	30 (6.98)	0.035	S
21-25	80 (36.36)	51 (45.95)	29 (42.65)	12 (38.71)	92 (43.81)	172 (40)	0.04	S
26-30	86 (39.09)	34 (30.63)	28 (41.18)	11 (35.48)	73 (34.76)	159 (36.98)	0.12	NS
31-35	40 (18.18)	11 (9.91)	5 (7.35)	3 (9.68)	19 (9.05)	59 (13.72)	0.25	NS
≥35	6 (2.73)	3 (2.70)	1 (1.47)	0	4 (1.90)	10 (2.32)	0.45	NS
Total	220	111	68	31	210	430		
Type of family								
Joint	163 (74.09)	84 (75.68)	58 (85.29)	28 (90.32)	170 (80.95)	333 (77.44)	0.02	S
Nuclear	57 (25.91)	27 (24.32)	10 (14.71)	3 (9.68)	40 (19.05)	97 (22.56)	0.02	S
Total	220	111	68	31	210	430		
Religion								
Hindu	183 (83.18)	93 (83.78)	57 (85.29)	26 (83.87)	176 (83.80)	359 (83.49)	0.212	NS
Muslim	35 (15.90)	18 (16.2)	11 (16.17)	5 (16.12)	34 (16.19)	69 (16.05)	0.212	NS
Sikh	1 (0.45)	-	-	-	-	1 (0.23)		
Christian	1 (0.45)	-	-	-	-	1 (0.23)		
Total	220	111	68	31	210	430		

Prevalence of anaemia as per socio-economic status (income, education and profession)

It is shown in Table 3. Majority of patients (197, 45.81%) belonged to upper middle class of Kuppuswamy classification. Significantly more women with upper middle and upper class had normal Hb with anaemia being less common in them. As per distribution of monthly income of family, anaemia was more common in lower income group (p=0.02) while normal Hb was more common in upper income group. Anaemia was more common in illiterate and primary education patients and was less common in high school and postgraduates. Most of women (346, 80.46%) were housewives and anaemia was more common in them (p=0.04). Anaemia was significantly less common in professionals (p=0.01).

Obstetric factors

The effect of various obstetric factors on prevalence and severity of anaemia is shown in Table 4. Most women (205, 47.67%) were primigravidas, followed by 167 (38.83%) second gravidas. Significantly more primigravida women (51.36%) were in normal Hb group than anaemia group (43.80%) (p=0.04). Severe anaemia was more common (54.83%) in third gravidas (p=0.01). Most (365, 84.88%) had no abortion while 43 (10%) had one abortion and 13(3.02%) had two abortions. There were significantly more cases of previous three abortions (3.80%) in anaemia group than zero in normal Hb group (p=0.02). Gestation wise distribution of patients is also shown in Table 4. There were only 18 (4.18%) women between 12 to 16 weeks of gestation and anaemia was less common in them (p=0.01). There were 30 (6.97%) women between 16.1 to 20 weeks, 55 (12.79%) between 21.1, to 24 weeks, 73 (16.97%) women between 24.1 to 28 weeks, 54 (12.55%) between 28.1 to 32 weeks, 108 (25.11%) between 32.1 to 36 weeks. There was no difference in anaemia and normal Hb group. However, anaemia was more common at term (37 to 41 weeks) (p=0.04).

Table 3: Prevalence and severity of anaemia as per socio-economic status, monthly income, education and profession.

	Normal (n=220)	Mild (n=111)	Moderate (n=68)	Severe (n=31)	Anaemia (n=210)	Total (n=430)	P value	Significance
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)		
Characterstics Kuppuswami's class								
Lower <5	0	-	24 (35.29)	17 (54.83)	41 (19.52)	41 (9.53)	0.001	NS
Upper lower 5-10	2 (0.92)	-	29 (42.64)	11 (35.48)	40 (19.04)	42 (9.77)	0.12	NS
Lower middle 11-15	27 (12.27)	3 (2.70)	13 (19.11)	3 (9.6)	19 (9.04)	46 (10.70)	0.105	NS
Upper middle 16-25	122 (55.45)	73 (65.76)	2 (2.94)	-	75 (35.71)	197 (45.81)	0.045	S
Upper 26-29	69 (31.36)	35 (31.53)	-	-	35 (16.66)	104 (24.19)	0.03	S
Total	220	111	68	31	210	430		
Monthly income in Rs								
<25000	5 (2.27)	-	29 (42.64)	18 (58.06)	47 (22.38)	52 (12.09)	0.02	S
25001-50000	16 (7.27)	2 (1.80)	25 (36.76)	10 (32.25)	37 (17.61)	53 (12.32)	0.03	S
50001-75,000	25 (11.36)	17 (15.31)	12 (17.64)	3 (9.67)	32 (15.23)	57 (13.25)	0.25	NS
75001 to 1 lakh	116 (52.72)	67 (60.36)	2 (2.94)	-	69 (32.85)	185 (43.02)	0.04	S
>1lakh	58 (26.36)	25 (22.52)	-	-	25 (11.90)	83 (19.30)	0.05	S
Total	220	111	68	31	210	430		
Education of patients								
Illiterate	4 (1.81)	2 (1.80)	18 (26.47)	17 (54.83)	37 (17.61)	41 (9.53)	0.01	S
Primary School	3 (1.36)	3 (2.70)	22 (32.35)	11 (35.48)	36 (17.14)	39 (9.07)	0.01	S
Middle School	22 (10)	15 (13.51)	23 (33.82)	2 (6.45)	40 (19.04)	62 (14.42)	0.07	NS
High School	81 (36.81)	57 (51.35)	3 (4.41)	1 (3.22)	61 (29.04)	142 (33.02)	0.02	S
Graduate	67 (30.45)	17 (15.31)	2 (2.91)	-	19 (9.04)	86 (20)	0.01	S
Post Graduate	43 (19.54)	17 (15.31)	-	-	17 (8.09)	60 (13.95)		
Total	220	111	68	31	210	430		
Occupation of patients								
House wife	163 (74.09)	100 (90.09)	58 (85.29)	25 (80.64)	183 (87.14)	346 (80.46)	0.04	S
Unskilled	0	1 (0.90)	3 (4.41)	1 (3.22)	5 (2.38)	5 (1.16)	0.25	NS
Skilled	33 (15)	9 (8.10)	4 (5.88)	5 (16.12)	18 (8.57)	51 (11.86)	0.06	NS
Professional	24 (10.90)	1 (0.90)	3 (4.41)	0	4 (1.90)	28 (6.51)	0.01	S
Total	220	111	68	31	210	430		

Table 4: Distribution of patients as per gravidity, previous abortions and gestations.

	Normal (n=220)	Mild (n=111)	Moderate (n=68)	Severe (n=31)	Anaemia (n=210)	Total (n=430)	P value	Significance
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)		
Gravidity								
1	113 (51.36)	63 (56.75)	27 (39.70)	2 (6.45)	92 (43.80)	205 (47.67)	0.04	S
2	84 (38.18)	45 (40.54)	32 (47.05)	6 (19.35)	83 (39.52)	167 (38.83)	0.12	NS
3	22 (10)	3 (2.70)	8 (11.76)	17 (54.83)	28 (13.33)	50 (11.62)	0.07	NS
4	1 (0.45)	-	1 (1.47)	3 (9.67)	4 (1.90)	5 (1.16)	0.512	NS
5	-	-	-	3 (9.67)	3 (1.42)	3 (0.69)	0.512	NS
Total	220	111	68	31	210	430		
Previous abortions								
Abortion								
0	192 (87.27)	96 (86.48)	58 (85.29)	19 (61.29)	173 (82.38)	365 (84.88 of total)	0.12	NS
1	22 (10)	11 (9.90)	7 (10.29)	3 (9.67)	21 (10)	43 (10)	0.121	NS
2	6 (2.72)	4 (3.60)	2 (2.94)	1 (3.22)	7 (3.33)	13 (3.02)	0.110	NS
3	-	-	1 (1.47)	7 (22.58)	8 (3.80)	8 (1.86)	0.02	S
4	-	-	-	1 (3.22)	1 (0.47)	1 (0.23)	0.07	NS
Total	220	111	68	31	210	430		
Gestation wise								
Weeks of gestation								
12-16	14 (6.36)	4 (3.60)	-	-	4 (1.90)	18 (4.18)	0.01	S
16.1-20	16 (7.27)	8 (7.20)	4 (5.88)	2 (6.45)	14 (6.66)	30 (6.97)	0.124	NS
20.1-24	31 (14.09)	13 (11.71)	8 (11.76)	3 (9.67)	24 (11.42)	55 (12.79)	0.122	NS
24.1-28	35 (15.90)	15 (13.51)	18 (26.47)	5 (16.12)	38 (18.09)	73 (16.97)	0.121	NS
28.1-32	25 (11.36)	10 (9.0)	12 (17.64)	7 (22.58)	29 (13.80)	54 (12.55)	0.54	NS
32.1-36	58 (26.36)	31 (27.92)	12 (17.64)	7 (22.58)	50 (23.80)	108 (25.11)	0.58	NS

Continued.

	Normal (n=220)	Mild (n=111)	Moderate (n=68)	Severe (n=31)	Anaemia (n=210)	Total (n=430)	P value	Significance
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)		
37-41	40 (18.18)	29 (26.12)	13 (19.11)	7 (22.58)	49 (23.33)	89 (20.69)	0.04	S
>41	1 (0.45)	1 (0.90)	1 (1.47)	-	2 (0.95)	3 (0.69)	0.118	NS
Total	220	111	68	31	210	430		

Table 5: Prevalence and severity of anaemia as per antenatal visits and tetanus immunization.

	Normal (n=220)	Mild (n=111)	Moderate (n=68)	Severe (n=31)	Overall anaemia (n=210)	Overall (n=430)	p value	Significance
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	(Normal vs. anaemia)	
Antenatal visits								
No antenatal visit	3 (1.36)	4 (3.60)	6 (8.82)	20 (64.52)	30 (14.29)	33 (7.67)	0.02	S
Irregular antenatal visits	37 (16.82)	19 (17.12)	41 (60.29)	11 (35.48)	71 (33.81)	108 (25.11)	0.05	S
Regular antenatal visits	180 (81.82)	88 (79.28)	21 (30.88)	0	109 (51.90)	289 (67.21)	0.02	S
Tetanus immunization								
No tetanus injection	3 (1.36)	2 (1.80)	3 (4.41)	7 (22.58)	12 (5.71)	15 (3.49)	0.05	S
One tetanus injection	43 (19.54)	22 (19.82)	33 (48.53)	23 (74.19)	78 (37.14)	121 (28.14)	0.05	S
Two tetanus injection	174 (79.09)	87 (78.38)	32 (47.06)	1 (3.22)	120 (57.14)	294 (68.37)	0.04	S

Statistically significant at $p<0.05$.

Effect of antenatal visits and tetanus immunization on prevalence and severity of anaemia

It is shown in Table 5. Only 33 (7.67%) patients had no antenatal visits and anaemia was significantly more common in them (p=0.02). A total of 20 (64.52%) women of severe anaemia group had no antenatal visits as compared to 3 (1.36%) of normal Hb group (p=0.001). A total of 108 (25.11%) women had irregular antenatal visits and anaemia was more common in them (p=0.05). A total of 289 (67.21%) women had regular antenatal checkups and anaemia was significantly less common in them (p=0.02). Only 15 (3.49%) women had no tetanus immunization and anaemia was more common in them (p=0.05). A total of 121 (28.14%) patients had one dose of tetanus /toxoid and anaemia was more common in them (p=0.05). While majority 294 (68.37%) had two doses of tetanus toxoid and anaemia was less common in them (p=0.04).

DISCUSSION

The prevalence of anaemia in the present study was found to be 48.84% with mild anaemia being 25.81% (52.86% of anaemia group), moderate anaemia being 15.81% (32.38% of anaemia group) and severe anaemia being 6.98% (14.29% of anaemia group) with only one case (0.24%) being very severe anaemia. The present prevalence of 48.84% was higher than global prevalence of 36% by Stevens et al but was lower than 75% in Africa and Asia by WHO.[1,14] Various studies in Africa showed prevalence of anaemia during pregnancy to be 40.8% in Ghana (Anlaaku and Antu), 24.2% in Ethiopia (Delil et al), 57.3% in Nigeria (Oyerinde et al), 31% in South Africa (Dorsamy et al), 25.2% in Tanzania (Abdallah et al), and 24.7% in Uganda (Udhoa et al).[15-20] The prevalence of anaemia was much lower in China being 18.9% (Wu et al).[21] The prevalence of 48.84% in present study was in line with prevalence in other Southeast Asian countries being least in Bhutan (28%,Campbell et al) followed by 33.1% in Sri Lanka (Sheriff et al), 36.5% in Afghanistan (Zewar et al), 42-47% in Nepal (Marahatta et al) and highest in Pakistan (90.5%, Baig-Ansari et al).[22-26]

The prevalence of anaemia in pregnancy in different Indian studies varied from 47.18% to 96.5% being (47.18%) in Coastal Andhra Vizianagaram (Vemulapalli et al), 63% in Kolar, Maharashtra (Suryanarayana et al).[27,28] Older studies showed prevalence of anaemia in pregnancy to be much higher being 82.9% by Viveki et al, 84% by Agarwal et al and 84.9% by Toteja et al.[29-31] An older study in Delhi in 2002 showed prevalence of anaemia during pregnancy to be 96.5%.[32] The prevalence has decreased over time possibly due to better effluence and better understanding about antenatal care and iron supplementation with time. However, despite Anaemia Mukt Bharat Programme, the prevalence didn't decrease much from National Family Health Survey-4 (NFHS-4) (2016-2018) to NFHS-5 (2019-2021).[12] Infact overall prevalence of anaemia increased from 50.1% in NFHS-4 to 52% in NFHS-5.[3]

The lowest prevalence of anaemia in NFHS-5 was in Kerala being 31.4% and highest was in Ladakh being 78.1%.[3] The prevalence of anaemia in pregnancy in

National Capital Region, Delhi decreased marginally from 46.1% in NFHS-4 (2016 to 2018) to 42.2% in NFHS-5 (2019-2021). The present prevalence of 48.84% was higher than overall Delhi of 42.2% in NFHS-5. It could be due to poor patients coming to this public health hospital catering to poor socio-economic status patients offering free health service. The prevalence is probably lower in private hospitals catering to rich patients.

Various determinants of anaemia in present study were young age, lower socio-economic status, less family income, illiteracy or lesser education, multiparity, absent or irregular antenatal care. The results are at par with other International and National studies. Various determinants of anaemia by various authors are low income (Sheriff et al, Mbule et al, Silubonde et al), low education (Zewar et al, Silubonde et al, Mare et al), higher gravidity (Suryanarayana et al, Zhang et al, Habib et al), Absent or irregular, antenatal care (Mare et al, Zhang et al, Rahman et al).[23,24,28,33-38] The results of present study are at par with these studies.

CONCLUSION

As per the findings of the present study, prevalence of anaemia during pregnancy continues to be very high (48.84%) and is associated with high gravidity, illiteracy, low income and socio-economic status, no or irregular antenatal care. The study recommends awareness programmes regarding use of ante-natal care, improving education and socio-economic status to reduce prevalence of anaemia during pregnancy.

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