Original Research Article

Prevalence and risk factors associated with anemia among pregnant women receiving ANC at Jalalabad Ragib-Rabeya Medical College and Hospital, Sylhet, Bangladesh

ABSTRACT

Background: Anemia during pregnancy is a major public health problem throughout the world. The prevalence is high in developing countries compared to developed countries. In Bangladesh, anemia during pregnancy is a leading cause of maternal mortality and morbidity as it acts as an additional risk factor of pregnancy complications. This study aimed to estimate the prevalence of anemia among pregnant mothers and determine associated risk factors.

Methodology: A cross-sectional study was conducted among pregnant women attending ANC at Jalalabad Ragib-Rabeya Medical College and Hospital (JRRMCH), Sylhet from February to May 2022. A total of 400 study subjects were selected by systematic random sampling technique. A semi-structured questionnaire was used for data collection. Data were analyzed by using SPSS. Chi-square test was carried out to determine associated risk factors. A *P*-value less than .05 was considered statistically significant.

Result: Among 400 study participants, the prevalence was 53.50%. Among them 32.25% had mild anemia, 20.25% had moderate anemia and 1% had severe anemia. The prevalence was found high in rural area (58.09%) than urban area (46.54%). Majority of them were in the age group between 15-26 years. About 44.75% were primi gravida and 55.25% were multi gravida. About 70.25% of the respondents had taken iron supplementation. Strong association was found between anemia and several variables, and these variables are geographic region, education, occupational status, family type, family size, monthly family income, water and sanitation hygiene, health status, age at marriage, parity, gravidity, iron intake, and food frequency.

Conclusion: In our study more than half of pregnant mothers were anemic and majority of them had mild to moderate anemia. Based on identified risk factors it is highly recommended to improve socio-economic condition, level of education, family planning services and nutritional status. Iron supplementation should be encouraged for pregnant mothers.

Keywords: Anemia, ANC, Socio-demographic Characteristics, Dietary Characteristics, Obstetrical Characteristics.

1. INTRODUCTION

Anemia is a major public health problem throughout the world. A total of 2.36 billion people around the world were affected by anemia in 2015 [1]. Institute for Health Metrics and Evaluation HDN, The World Bank stated that, anemia is significantly responsible for 3.4% of global disability [2]. World Health Organization (WHO) stated that, the global anemia prevalence in 2019 was 29.9% in women of reproductive age (15-49 years) and it was 29.6% in non-pregnant women of reproductive age and 36.5% in pregnant women [3]. Anemia is a common medical disorder during pregnancy [4].

According to WHO, anemia in pregnancy can be defined as the hemoglobin concentration of less than 11 gm/dl [5]. Clinical features of anemia in pregnant women include fatigue, weakness, dizziness, headache, pale skin, shortness of breath, tachycardia, and hypotension [6]. During pregnancy, iron deficiency anemia is more common [6]. Iron deficiency is the cause of 75% of anemia cases [7]. During pregnancy, inadequate intake and less bioavailability of iron-rich foods also contribute significantly for the onset of anemia [7]. Other types of anemia include folate deficiency anemia and megaloblastic anemia due to vitamin B12 deficiency. According to the latest report of WHO, the global prevalence of anemia among pregnant women (15-49 yrs.) is 36.5% and the prevalence is highest (47.8%) in Southeast Asia [8]. Anemia is more prevalent in developing countries (42.8%) compared to developed countries (9.1%) [9]. Between 1995 and 2011, the global prevalence of anemia during pregnancy decreased from 43% to 38% and in South Asia it declined from 53% to 52% due to progress in socio-economic and health status [10]. Based on nationally representative Demographic and Health Surveys Program data collected from women of reproductive age (15–49 years) in 2011, the prevalence of anemia in Bangladesh was 41.8% [11]. According to WHO, prevalence of anemia during pregnancy was 44.2% in 2012, 43.9% in 2013, 43.6% in 2014, 43.3% in 2015, 43.1% in 2016, 42.8% in 2017, 42.5% in 2018 and 42.2% in 2019 in Bangladesh [8]. Several survey-based studies have been conducted at various places in Bangladesh. Those studies estimated that the prevalence of anemia during pregnancy was 37% in 2015, 42.7% in 2016, 56.52% in 2017, 58.9% in 2019 and 62.5% in 2021 [12, 13, 14, 15, 16]. It indicates that there is a substantial variation in the prevalence of anemia among pregnant women within Bangladesh. Multiple adverse maternal and neonatal outcomes have been attributed to anemia [17]. These outcomes vary according to severity of anemia [18]. Anemia increases the risk of placental abruption, severe PPH, maternal shock and maternal death [19]. Severe anemia causes approximately 20% of maternal deaths and it acts as an additional risk factor for 50% of all maternal deaths in developing countries [20]. According to WHO survey of the causes of maternal mortality, anemia is the second highest cause of maternal death in Asia and responsible for 12.8% of all maternal deaths resulting from PPH [21]. Pregnancy outcome with anemia results in preterm delivery, Low Birth Weight, fetal impairment, and fetal death, IUGR, fetal malformation, still birth and in severe cases, it may cause perinatal mortality and neonatal mortality [15, 19, 22, 23].

Determinants of anemia in low- and middle-income countries can be classified broadly in three major groups: nutritional deficiencies, infectious diseases, and genetic hemoglobin disorders [24]. Factors that are responsible for anemia among pregnant mothers include poor nutritional status, inadequate diet, poor antenatal care services, socio-demographics, genetic, abortions, multi-parity, repeated childbirth, inadequate dietary iron intake, lack of proper water and sanitation hygiene, regional variation, and parasitic infection [7, 25, 26, 27]. Several studies conducted in different cities in Bangladesh determined various risk factors of anemia which include maternal age, maternal education, living area, family size, monthly family income, parity, gravidity, contraception and iron supplementation, gestational age, birth spacing, excessive blood loss during previous surgery and food frequency [12, 13, 14]. The prevalence of anemia in pregnancy varies in women with different socioeconomic conditions, diets, lifestyles, or health-seeking behaviors across different cultures. A study has shown that anemia prevalence in pregnancy is more in rural areas than urban areas in Bangladesh and the reasons of this variation are considerably due to the differences in educational level, socioeconomic status, and lifestyle [11]. In various studies, the salutary effect of iron supplementation on improvement of hemoglobin levels in pregnancy has been documented [28]. Routine prophylaxis of iron is commonly recommended for pregnant women. Initiation of supplementation before conception is needed to reduce maternal anemia during early pregnancy [29].

To our information, no studies have ever been conducted at the area we selected for our investigation. Therefore, the main goal of this study was to estimate the prevalence of anemia and determine associated risk factors of it among pregnant women attending ANC at JRRMCH, a tertiary level hospital in Sylhet, Bangladesh.

2. MATERIAL AND METHODS

2.1 Type of Study: A Cross-sectional study.

2.2 Study Area: This study was carried out at the department of Obstetrics and Gynecology of JRRMCH, Sylhet, Bangladesh. JRRMCH is a tertiary level hospital, established in 1995. It is in the center of divisional city Sylhet. There are more than one thousand beds to provide the health care to people coming from all the four districts of Sylhet division. This hospital has more than three thousand employee including doctors, nurses, and other staffs. The department of Obstetrics and Gynecology provides various pregnancy and gynecological health services. It provides ANC services to more than one hundred patients every day.

2.3 Study Population: All pregnant women who came to attend ANC at JRRMCH, Sylhet, Bangladesh.

2.4 Inclusion criteria: Pregnant women at the study site willing to participate in the study.

2.5 Exclusion criteria: Pregnant women who are not willing to participate in the study.

2.6 Study period: The study period was February to May 2022.

2.7 Sample size: The following formula was used to determine the minimum sample size (n) by considering a 95% confidence interval (CI) and 5% marginal error.

$$n = \left(\frac{Z}{E}\right)^2 p(1-p) = 374.81 \approx 375$$

Where, critical value at 95% confidence, Z = 1.96, marginal error, E = 5%, anemia prevalence in pregnancy in Bangladesh, p = 42.2% (WHO, 2021).

2.8 Sampling Technique: Sample data were drawn by using systematic random sampling technique. One in every three patients was systematically chosen as study participants. Since the population is in a random order, systematic sampling can imitate the benefit of simple random sampling.

2.9 Data collection instrument: A semi-structured questionnaire was prepared at the beginning of the study by considering the objectives and variables of the study and it will be pretested before finalization.

2.10 Data collection method: Data was collected by conducting face to face interviews, clinical examination and collecting investigation reports of the respondents with their informed consent. The interviews will be conducted in the department of Obstetrics and Gynecology at JRRMCH.

2.11 Data processing: Data was recorded in Microsoft excel and it was checked to exclude any error or inconsistency at the end of every working day. Incomplete data was completed by further interview.

2.12 Data quality control: Collected data from the selected hospital was checked, rechecked, and verified by the investigator at the end of every working day. To ensure reliability and validity of data, randomly selected 5% data was recollected and compared with the previous data within 72 hours.

2.13 Data analysis: Data was analyzed by Statistical Package for the Social Science (SPSS). Frequency and percentage were computed for categorical data and mean and standard deviation for quantitative data. The summarized data was presented through Frequency tables and graphs. Chi-square test was carried out to determine the association of the variables with anemia. In every case, *P*-value < 0.05 was considered statistically significant.

2.14 Validity of research instrument: To ensure the validity of research instrument (Questionnaire), a pilot test was done in similar settings before finalizing questionnaire. The questionnaire was also verified by taking expert opinions regarding its validity.

3. RESULTS

3.1 Socio-demographic characteristics of respondents

Among 400 study participants, majority of pregnant mothers were from Sunamganj district (42.25%) and 60.25% of women resided in rural area. Most of the study populations were in the age group ranged from 27 years to 38 years and the mean age was26.9 (±6.4) years. Most of the women were housewife by occupation.15.50% of attendant had no education, 25.50% had primary education and 18.25% had education up to graduate level. A greater majority of the respondents were Muslim by religion. The trend of joint family was higher. 60.75% of the respondents belonged to a family with 2-5 members. 46% lived in a socio-economic condition with monthly family income <25000tk. About 97% were using safe water and hygienic sanitation.

Table 1. Socio-demographic characteristics of respondents

Characteristic	Total N (%)	Prevalence of anemia, N (%)		*P*-Value
		Anemic	Non anemic	
Age	400			.24
15-26 years	212 (53.00)	112 (52.83)	100 (47.17)	
27-38 years	167 (41.75)	87 (52.10)	80 (47.90)	
39-50 years	21(5.25)	15 (71.43)	6 (28.57)	
Weight	400			.38
30-51 Kg	121 (30.25)	66 (54.55)	55 (45.45)	
52-73 Kg	248 (62.00)	128 (51.61)	120 (48.39)	
74-96 Kg	31 (7.75)	20 (64.52)	11 (35.48)	
Home district	400			.63
Sylhet	142 (35.50)	71 (50.00)	71 (50.00)	
Moulvibazar	42 (10.50)	25 (59.52)	17 (40.48)	
Habiganj	47 (11.75)	24 (51.06)	23 (48.94)	
Sunamganj	169 (42.25)	94 (55.62)	75 (44.38)	
Geographic region	400			.02
Rural	241 (60.25)	140 (58.09)	101 (41.91)	
Urban	159 (39.75)	74 (46.54)	85 (53.46)	
Education	400			.002
Illiterate	62 (15.50)	41 (66.13)	21 (33.87)	
Primary	102 (25.50)	56 (54.90)	46 (45.10)	
Secondary	78 (19.50)	49 (62.82)	29 (37.18)	
Higher secondary	85 (21.25)	42 (49.41)	43 (50.59)	
College or university	73 (18.25)	26 (35.62)	47 (64.38)	
Religion	400			.07
Hindu	93 (23.25)	42 (45.16)	51 (54.84)	
Muslim	307 (76.75)	172 (56.03)	135 (43.97)	
Occupational status	400			.002
Housewife	312 (78.00)	182 (58.33)	130 (41.67)	
Govt. job	19 (4.75)	7 (36.84)	12 (63.16)	
Private job	53 (13.25)	21 (39.62)	32 (60.38)	
Student	16 (4.00)	4 (25.00)	12 (75.00)	
Family Type	400			.001
Nuclear	127 (31.75)	53 (41.73)	74 (58.27)	
Joint	273 (68.25)	161 (58.97)	112 (41.03)	
Number of family members	400			.03
2-5	243 (60.75)	117 (48.15)	126 (51.85)	
6-9	138 (34.50)	85 (61.59)	53 (38.41)	
10-13	19 (4.75)	12 (63.16)	7 (36.84)	
Family monthly income (in BDT)	400			.002
0-25000 TK	184 (46.00)	113 (61.41)	71 (38.59)	
25000-50000 TK	155 (38.75)	80 (51.61)	75 (48.39)	
50000-75000 TK	38 (9.50)	15 (39.47)	23 (60.53)	
75000-100000 TK	23 (5.75)	6 (26.09)	17 (73.91)	
Water and Sanitation system	400			.001
Hygienic	387 (96.75)	201 (51.94)	186 (48.06)	
Unhygienic	13 (3.25)	13 (100)	0 (0)	

* Chi-square test was done at 5% level of significance

3.2 Nutritional status and obstetrical characteristics of respondents:

In our study, 78.0% of pregnant mothers were well-nourished. Majority of them (49.0%) were in their third trimester, 28.25% were in their second trimester and 22.75% were in first trimester. 55.25% were multi gravida and 44.75% were primigravida. Average at age marriage ranged between 10-24 in 79.50% women and 82.81% had given birth to their first child at the age between 15-26 years. 89.59% had 1-3 children in their family. Only 10.75% mothers attended ANC at their first, second and third trimester. Co-morbidity found in 13.75% mothers. More than half of the attendants, 75.11% had birth spacing >2 years between two subsequent pregnancies and 24.89% had birth spacing less than 2 years.11.25% had history of miscarriage,14.0% had previous history of major surgery and 3% had history of excessive blood loss during

previous surgery. About 9.75% were previously infected with hookworm. Only one respondent had history of current malaria attack. 26.75% had used OCP for contraception.

Table 2. Nutritional status and general health characteristics of respondents

Characteristic	Total N (%)	Prevalence of anemia, N (%)		*P*-Value
		Anemic	Non anemic	
Nutritional status (appearance)	400			.02
Malnourished	88 (22.00)	57 (64.77)	31 (35.23)	
Well-nourished	312 (78.00)	157 (50.32)	155 (49.68)	
Comorbidity (DM, HTN, CKD, CLD)	400			.11
Present	55 (13.75)	35 (63.63)	20 (36.37)	
Absent	345 (86.25)	179 (51.88)	166 (48.12)	
Current malaria attack	400			
Yes	1 (0.25)	1 (100)	0 (0)	
No	399 (99.75)	213 (53.38)	186 (46.62)	
History of Hookworm infestation	400			.21
Present	39 (9.75)	22 (56.41)	17 (43.59)	
Absent	262 (65.50)	132 (50.38)	130 (49.62)	
Could not mention	99 (24.75)	60 (60.61)	39 (39.39)	
History of previous surgery	400			.24
Yes	56 (14.00)	34 (60.71)	22 (39.29)	
No	344 (86.00)	180 (52.33)	164 (47.67)	
Excessive blood loss during previous surgeries	400			.35
Yes	12 (3.00)	8 (66.67)	4 (33.33)	
No	388 (97.00)	206 (53.09)	182 (46.91)	

* Chi-square test was done at 5% level of significance

Table 3. Obstetrical characteristics of respondents

Characteristic	Total N (%)	Prevalence of anemia, N (%)		*P*-Value
		Anemic	Non anemic	
Duration of marriage	400			.17
0-10 years	316 (79.00)	160	156	
10-20 years	65 (16.25)	41	24	
20-30 years	19 (4.75)	11	8	
Age at marriage	400			.01
10-24 years	318 (79.50)	180 (56.60)	138 (43.40)	
25-39 years	82 (20.50)	34 (41.46)	48 (58.54)	
Age at first child born	221			.96
15-26 years	183 (82.81)	110 (60.11)	73 (39.89)	
27-39 years	38 (17.19)	23 (60.53)	15 (39.47)	
Age of last child	221			.83
1-10 years	202 (91.40)	122 (60.40)	80 (39.60)	
10-19 years	19 (8.60)	11 (57.89)	8 (42.11)	
Average birth spacing	221			.13
Less than two	55 (24.89)	35 (63.64)	20 (36.36)	
Two or more	166 (75.11)	90 (54.22)	76 (45.78)	
Number of children	400			.003
None	179 (44.75)	81 (45.25)	98 (54.75)	
One	97 (24.25)	50 (51.55)	47 (48.45)	
Two	77 (19.25)	51 (66.23)	26 (33.77)	

Three or more	47 (11.75)	32 (68.09)	15 (31.91)	
Gestational age	400			.40
First trimester	91 (22.75)	48 (52.75)	43 (47.25)	
Second trimester	113 (28.25)	55 (48.67)	58 (51.33)	
Third trimester	196 (49.00)	111 (56.63)	85 (43.37)	
Frequency of ANC visit	400			.21
One	165 (41.25)	98 (59.39)	67 (40.61)	
Two	89 (22.25)	45 (50.56)	44 (49.44)	
Three	103 (25.75)	52 (50.49)	51 (49.51)	
Four	43 (10.75)	19 (44.19)	24 (55.81)	
Para	221			.02
1-3	198 (89.59)	114 (57.58)	84 (42.42)	
4-7	23 (10.41)	19 (82.61)	4 (17.39)	
Gravida	400			.003
Primi	179 (44.75)	81 (45.25)	98 (54.75)	
Multi	221 (55.25)	133 (60.18)	88 (39.82)	
History of miscarriage	400			.77
Yes	45 (11.25)	25 (55.56)	20 (44.44)	
No	355 (88.75)	189 (53.24)	166 (46.76)	
History of contraceptive use	400			.40
Yes	107 (26.75)	61 (56.01)	46 (42.99)	
No	293 (73.25)	153 (52.22)	140 (47.78)	

* Chi-square test was done at 5% level of significance

3.3 Dietary practices of respondents:

Majority of respondents were meeting the minimum dietary diversity of food consumption from at least four of the six food groups. 21.25% were taking at least 3 meals per day. About 47.0% ate meat, fish, and egg regularly and others ate vegetables, milk, and fruits. 70.25% of respondents had taken multivitamin containing iron and folic acid.

Table 4. Dietary characteristics of respondents

Characteristic	**Total N (%)**	**Prevalence of anemia, N (%)**		***P*-Value**
		Anemic	**Non anemic**	
Iron intake	400			<.001
Yes	281 (70.25)	123 (43.77)	158 (56.23)	
No	119 (29.75)	91 (76.47)	28 (23.53)	
Meat consumption	400			<.001
Everyday	21 (5.25)	7 (33.33)	14 (66.67)	
Every alternate day	169 (42.25)	75 (44.38)	94 (55.62)	
Every week or less	210 (52.50)	132 (62.86)	78 (37.14)	
Fish consumption	400			<.001
Everyday	280 (70.00)	130 (46.43)	150 (53.57)	
Every alternate day	89 (22.25)	59 (66.29)	30 (33.71)	
Every week or less	31 (7.75)	25 (80.65)	6 (19.35)	
Green leafy vegetables consumption	400			.16
Everyday	381 (95.25)	204 (53.54)	177 (46.46)	
Every alternate day	19(4.75)	7 (36.84)	12 (63.16)	
Fruits consumption	400			.54
Everyday	373 (93.25)	201 (53.89)	172 (46.11)	
Every alternate day	12 (3.00)	7 (58.33)	5 (41.67)	
Every week or less	15 (3.75)	6 (40.00)	9 (60.00)	
Egg consumption	400			<.001
Everyday	276 (69.00)	130 (47.10)	146 (52.90)	
Every alternate day	42 (10.50)	22 (52.38)	20 (47.62)	
Every week or less	82 (20.50)	62 (75.61)	20 (24.39)	
Milk consumption	400			<.001
Everyday	254 (63.50)	112 (44.09)	142 (55.91)	

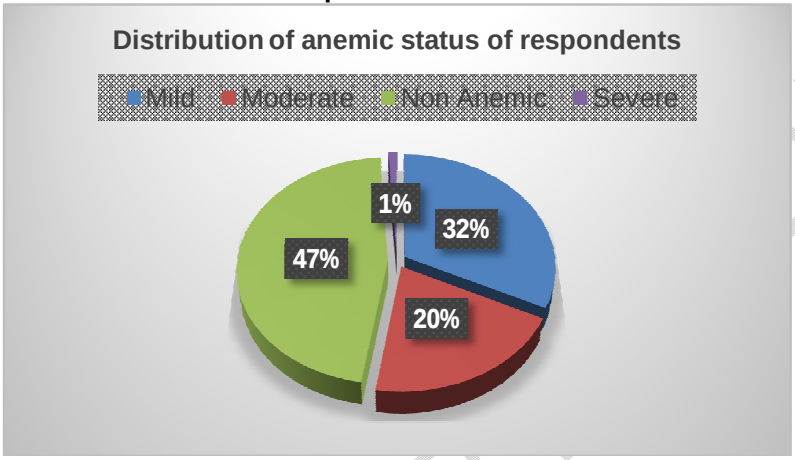
Every alternate day	32 (8.00)	20 (62.50)	12 (37.50)	
Every week or less	114 (28.50)	82 (71.93)	32 (28.07)	
Food frequency in 24 hours	400			<.001
1-3 meals	85 (21.25)	59 (69.41)	26 (30.59)	
4-6 meals	152 (38.00)	90 (59.21)	62 (40.79)	
> 6 meals	163 (40.75)	65 (39.88)	98 (60.12)	

* Chi-square test was done at 5% level of significance

3.4 Prevalence of anemia:

WHO classification of anemia for pregnant women was used which is shown in figure below:

Graph 1. Distribution of anemic status of respondents



Hb%>11gm/dl was considered as normal, 9-10.9gm/dl was considered as mild anemia, 7-8.9gm/dl as moderate anemia and <7gm/dl was considered as severe anemia.

In this study, Hb% was within the normal range among 186women. About 32% had mild anemia, about 20% had moderate anemia and 1% had severe anemia. The overall prevalence of anemia among the respondents was 53.50%. Among those anemic mothers, 52.75 % were in first trimester 48.67% were in second trimester and56.63% were in their third trimester.

3.5 Associated risk factors of anemia:

Table1, Table2 and Table3 show association of anemia during pregnancy with several factors including socio-demographic variables, nutritional status, obstetrical characteristics, and dietary practices. *P*<.05 was considered statistically significant. In our study, there was significant association of anemia with geographic region *(P*=.02), education (*P*=.002), occupational status (*P*=.002), family type (*P*=.001), family size (*P*=.03), monthly family income (*P*=.002), water and sanitation system (*P*=.001), nutritional status (*P*=.02), age at marriage (*P*=.01), parity (*P*=.02), gravidity (*P*=.003), iron intake (*P*<.001) and food frequency in 24 hours. But no significant association of anemia was found with age, weight, home district, religion, duration of marriage, birth spacing, gestational age, previous surgery, miscarriage, contraceptive use, and hookworm infestation.

4. DISCUSSION

In this study, the prevalence and associated risk factors of anemia among the pregnant women receiving ANC at JRRMCH; a tertiary level hospital in Sylhet, Bangladesh were assessed. The prevalence of anemia was found 53.50%. Out of 400 respondents, 214 women were found anemic. Among those anemic pregnant mothers 60.28% were mildly anemic, 37.85% were moderately anemic and 1.86% was severely anemic. Various studies have been conducted in different cities in Bangladesh. A study carried out in Dhaka city reported that the prevalence of anemia was 37% [14]. A cross-sectional study conducted in Jessore has been reported that the overall prevalence of anemia during pregnancy is 58.9% which is nearly like our study [12]. According to that study, majority of anemic mothers were moderately anemic (62.4%) whereas the prevalence of mildly anemic mothers was the highest (60.28%) in our study, but the percentage of severely anemic mothers found nearly same in both studies.

A study based on evidence from nationally representative survey data has been reported that the prevalence of anemia in Bangladesh is 41.8% [11]. However, the prevalence found in our study is higher than the overall prevalence found in Bangladesh [8]. The prevalence found in our study can differ considerably due to changes in level of education, socio-economic condition and proper health education and family planning services. The findings of our study determined several factors that are strongly associated with anemia during pregnancy including geographic region, education, occupational status, family type, family size, monthly family income, water and sanitation hygiene, health status, age at

marriage, parity, gravidity, iron intake, and food frequency which is almost like the findings of some other studies. Azhar et al. (2021) reported that, anemia during pregnancy is significantly associated with maternal age, monthly family income, parity, gravidity, contraception, and iron supplementation [13]. Ahmed et al. (2019) reported that there is a significant association of anemia with family size, gestational age, birth spacing, excessive blood loss during previous surgery and food frequency [12]. Chowdhury et al., (2015) reported that anemia in pregnancy is strongly associated with maternal age, maternal education, monthly income and living area [14]. Those studies found association with maternal age, birth spacing <2 years, gestational age, blood loss during previous surgery and contraceptive use but our study found no association of anemia with these factors. In our study, it was clearly estimated that anemia prevalence was found high among pregnant mothers with no education (66.13%), those who were living in rural area (58.09%) compared to urban area (46.54%), in a socio-economic condition with monthly family income <25000 TK (61.41%) which aligns with some other studies [11, 12, 14]. According to the findings of the study conducted by Chowdhury et al. (2015), Hb% was within normal range among about 65% of respondents those were taking oral iron supplementation throughout their pregnancy [14] whereas it was about 56.23% in our study. Most of anemic mothers were in their second and third trimester. This is due to an increase in iron absorption as pregnancy progresses [30].

5. CONCLUSION

Anemia during pregnancy has become a serious public health problem in Bangladesh. In our study more than half of pregnant mothers were anemic and majority of them had moderate anemia. Our study result suggests that it is highly recommended to improve socioeconomic condition, the level of education, water and sanitation hygiene and the quality of ante-natal services to prevent anemia among pregnant mothers. As all the women during pregnancy are the most vulnerable group to have anemia, proper knowledge and health education about anemia can reduce the severity and adverse outcomes of anemia. Iron supplementation during pregnancy should be encouraged by the government. Iron and folic acid supplementation for 3 months prior to pregnancy can reduce the chance of developing anemia in early pregnancy. Preventing anemia during pregnancy requires special attention in improving maternal health status. Government should take pragmatic interventions to ensure maternal health. Besides, non-governmental organizations should also work in the field level to raise awareness among people especially in rural areas. Moreover, educating people by providing proper knowledge about the cause and adverse effect of anemia in pregnancy as well as all the preventive measures may help to reduce the prevalence of anemia in pregnancy in Bangladesh.

CONSENT (WHERE EVER APPLICABLE)

Author declares that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

ETHICAL APPROVAL (WHERE EVER APPLICABLE)

Author hereby declares that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

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