

Prevalence of Moderate to Severe Anemia in Pregnancy and Risk Factors Identification

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ABSTRACT

Background: Anemia is the commonest hematological disorder that occurs in pregnancy. During maternal death audit in Shaheed Ziaur Rahman Hospital (SZMCH) shows that all the mothers were severely anemic. Anemia makes the mother vulnerable to most of the obstetric complications and death. To assess prevalence of moderate and severe anaemia in pregnancy and to identify the risk factors of anemia during their antenatal checkup. All pregnant women aged 18-36 years and who had at least 3 antenatal visits, had record of hemoglobin level at 16 weeks, 24-28 weeks and 36 weeks were included and those didn't fulfill the above criteria and also who declined consent were excluded.

Materials and methods: This prospective study was conducted in Gynae and Obstetric OPD of SZMCH, from February to December 2020. A total of 100 women were enrolled in this study. Interviews were conducted and some necessary investigations (Complete blood count and Hemoglobin electrophoresis) done during pregnancy.

Results: Prevalence of anemia in our study was 68%. The mean (\pm SD) age of the study subjects was 25.01 ± 4.2 years, ranging from 18 to 36 years. The majority 48 % had education from 8th grade to SSC and 29 cases at primary level. Majority 58 cases were from the rural area and 52% were primi gravid. The risk factors are-no iron intake, faulty intake of iron, faulty diet habit and probably undiagnosed hemoglobinopathies.

Conclusions: Anemia is high among pregnant women and is associated with lack of awareness in iron intake, faulty diet habit, defective iron absorption and undiagnosed hemoglobinopathies.

KEY WORDS

Hematological disorder; Moderate and severe anemia in pregnancy; Risk factors for anemia.

INTRODUCTION

Anemia is one of the most common encountered medical disorders during pregnancy in the world. It is a major public health problem with about two billion people suffering worldwide.¹ Global prevalence of anemia in pregnancy is estimated to be approximately 41.8% varying from a low of 5.7% in the United State of America to a high of 75% in Gambia.² Prevalence of anemia in pregnant women of Bangladesh was reported

as 50% and 59% according to 2 different surveys conducted on 1997 and 1998.³ Some women are anemic even before they become pregnant and others become progressively anemic during pregnancy.⁴

Iron absorption during pregnancy is determined by the amount of iron in diet, its bioavailability and the changes in iron absorption that occur during pregnancy. An acid environment in the duodenum helps in the absorption of iron. The frequent ingestion of antacids and chronic use of H₂ blockers and proton pump inhibitors diminishes the iron absorption. Vitamin C, in addition to the iron, may increase acid environment of the stomach and increase absorption. Iron requirements are greater in pregnancy than in non-pregnant state. Although iron requirements are reduced in the first trimester because of absence of menstruation.⁵ Total iron requirement during Pregnancy is estimated approximately 1000mg. This iron need is not squarely distributed throughout the pregnancy but mostly limited to the third trimester. Thus in the second half, the daily requirement actually becomes very much increased to the extent of about 6-7 mg.⁶ If this requirement is not met or if the women is previously Iron depleted, then Iron deficiency anemia develops. Iron deficiency anemia is most common during pregnancy. About 95% of anemia during pregnancy is due to iron deficiency.⁷

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Anemia during pregnancy is the commonest medical disorder that occurs in developing countries and it directly causes maternal death for about 20% and act as a predisposing factor another 20%. Perinatal mortality is higher in anemic women and cardiac failure during labor due to severe anemia is an important cause of mortality.⁸

According to WHO, anemia is defined as Hemoglobin (Hb) level <12g/dl in women and <13 g/dl in men. However normal hemoglobin distribution varies not only with sex but also with ethnicity and physiologic status. The most common type of anemia is iron deficiency anemia, usually caused by low iron intake or absorption or excessive iron loss. Nutritional anemia results from an inadequate intake of iron, protein, Vitamin B12, folic acid and vitamin C. According to WHO, during pregnancy, anemia is identified by hemoglobin levels less than 11.0 g/dL and may be divided into three levels of severity: mild anemia (Hb levels 9 to 10.9 g/dL) moderate anemia (Hb levels 7 to 8.9 g/dL) and severe anemia (Hb levels less than 7 g/dL).⁹ During pregnancy plasma volume expands (maximum around 32 weeks) resulting in hemo-dilution. For this reason, hemoglobin level below 10 g/dl at any time during pregnancy is considered Anemia (WHO.1993. CDC. 1990). Hemoglobin level at or below 9 g/dl, required detailed investigations and appropriate treatment.⁶

Anemia prevalence data remains an important indicator in public health since anemia is related to morbidity and mortality in the population groups usually considered to be the most vulnerable, pregnant women and children under five. Anemia prevalence study is also useful to monitor the progress of reproductive health. Despite efforts being made to reduce the burden of anemia, its prevalence is still high in developing countries.¹⁰

We wanted to determine the prevalence of anemia in pregnancy among the patient admitted at SZMCH, Bogura and the risk factors associated with it.

MATERIALS AND METHODS

This prospective study was done in Obstetrics & Gynaecology OPD at SZMCH from February to December 2020. Due to COVID-19 situation the number of pregnant women attending OPD was markedly reduced. So total 100 pregnant women aged 18-36 years, who had at least three antenatal visit at 16 weeks, 24-28 weeks and 36 weeks and necessary antenatal investigations were available, were enrolled in this study. CBC was done for all mother in our OPD Pathology Laboratory, those having no improvement of Hb level at 28 weeks and MCV<75 cubic micron and MCH<27 pg then Serum Ferritin and hemoglobin

electrophoresis done to exclude thalassemia. Hemoglobin level at 16 weeks, 24-28 weeks and 36 weeks were recorded. According to WHO, moderate anemia (Hb levels 7 to 8.9 g/dL) and severe anemia (Hb levels less than 7g/dL). We collect primary data from the ANC card of women. Data on socio-demographic characteristics such as age, educational level, frequency of iron intake and food habit of the mothers on to a questionnaire designed specifically for this study. For the statistical analysis, the Microsoft office Excel 2007 was used and results were expressed in percentages.

Each participant was informed about the research objectives, methods and techniques in detail, after which they provided written informed consent. We collected data ensuring the privacy and confidentiality by face-to-face interview. The Ethical Review Committee of the SZMCH had approved the study.

RESULTS

Taking the hemoglobin level <8.9 g/dl, prevalence of moderate anemia in our study was 20% at first visit, 32% in second visit and 14% in third visit. Severe anemia 1%, 2% and 1% in 1st, 2nd and 3rd visit (Table I). The mean (\pm SD) age of the study subjects was 25.01 (\pm 4.2) years, ranging from 18 to 36 years. The majority (48%) studied from 8th grade to SSC and 29% had primary level education. Majority (58%) were from the rural area and 52% were primi gravid.

Table I Maternal anemia at 16, 24-28 weeks and 36 weeks of pregnancy (n=100)

Weeks of pregnancy	Normal hemoglobin	Mild anemia	Moderate anemia	% of Moderate Anemia	Severe anemia	% of Severe Anemia
At 16 weeks	14	65	20	20%	1	1%
At 24-28 weeks	11	55	32	32%	2	2%
At 36 weeks	15	70	14	14%	1	1%

Table II Factors associated with anemia in pregnancy (n=100)

Variable	Frequency N%	Normal Hb In 2 nd visit	Mild Anemia In 2 nd visit	Moderate anemia In 2 nd Visit	Severe anemia In 2 nd visit
Age (Years)					
Mean age	26.4(\pm 2.81)				
years 18---25	58	4	27	16	1
26---36	42	7	23	14	1
Educational level	100				
Illiterate	2	0	0	1	1
Primary to 8th grade	29	2	12	15	0
Secondary and above	48	4	30	13	1

Graduate & Above	21	4	13	4	0
Iron intake with advice	100				
No Iron/No advice	19	4	9	6	0
Iron/Advice	81	7	65	26	2
Drug intake-Progesterone	100				
No	53	6	26	20 (37.73%)	1
Yes	47	5	29	12 (25%)	1

Table II shows Moderate anemia decreased in secondary and graduate level of educational status. Progesterone therapy has no effect on anemia.

Table III Other associated factors for anemia in pregnancy

Variable	Frequency-n	No Anemia at 2 nd visit	Mild anemia at 2 nd visit	Moderate anemia at 2 nd visit	Severe anemia at 2 nd visit
Sun exposure	100				
No	54	5	27	20	2
Yes	46	6	28	12	0
Living area	100				
Rural	58	7	34	15	2
Urban	42	4	21	17	0
Gravida	100				
Primi	52	4	30	17	1
Multi gravida	48	7	25	15	1

Table III shows sun exposure have positive effect, for prevention of anemia. Those living in urban area having more anemic.

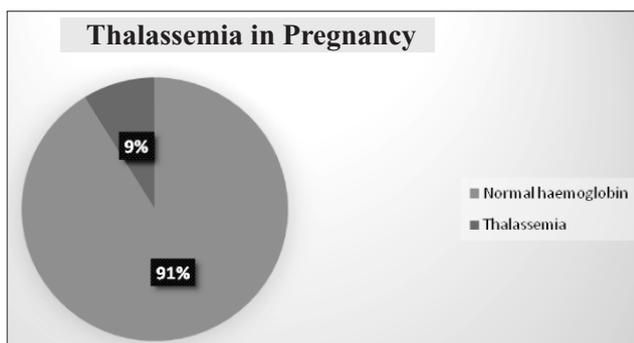


Figure 1 Frequency distribution of thalassemia cases

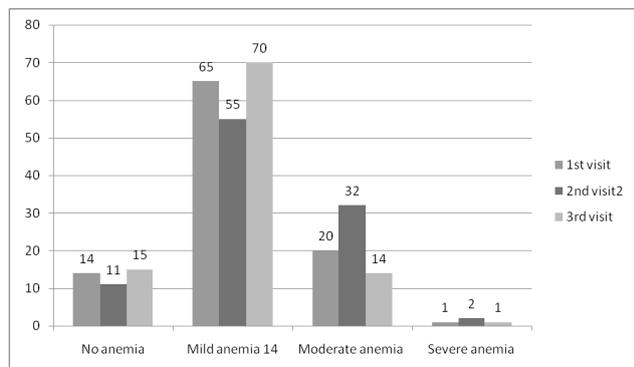


Figure 2 Distribution of Anemia in 1st, 2nd and 3rd visit

DISCUSSION

Anemia in pregnancy is a public health problem especially in developing countries associated with adverse outcomes.¹¹ According to WHO, anemia is considered to be a public health problem if population studies find the anemia prevalence of 5% or higher. Defining prevalence of >40% in as a severe public health problem, we found a prevalence proportion of 32%, which is high to alarm effective public health measures from the policy makers.¹² Researchers report 19-50% of prevalence of anemia in pregnancy.¹³ The prevalence of anemia in pregnancy has been reported to be 59% in Bhutan, 65% in Nepal and 60% in Sri Lanka¹⁴. In Bangladesh, the estimated prevalence of anemia was 50% in 1997-1998.¹⁵ Another study in Bangladesh in 2003 reported that about 40% of pregnant women were anemic.¹⁶ Therefore, it indicates that a large variation in anemia prevalence exists between countries and possibly within a country. The high prevalence proportion in our study may be due to the study place is a tertiary hospital, where most of the cases come with high risk pregnancy. In our study at 2nd visit found 11% normal hemoglobin and 55% mild, 32% moderate and 2% severely anemic. It can vary considerably due to sun exposure, living area and health-seeking behaviors across different parts of the country. An Indian study reported that among 66 pregnant women, 40.92% had mild, 54.54% moderate, and 4.54% severe anaemia.¹⁷ Results of another study showed that, of 51 pregnant anemic women, 9 (18%) were mildly, 30 (58%) moderately, 9 (18%) severely and 3 (6%) were very severely anaemic¹⁸. We didn't find any very severe anemia in our study compared to those of Indian studies.

The results of our study showed that level of education of mothers was associated with anemia. This finding is supported by findings of Erlindawati et al. in which literacy of women had a significant association with the use of antenatal care services as education has an impact on awareness of use of health services among the population.¹⁹ In present study, 14% of the pregnant women had moderate anemia in third trimester, which was 32% in second trimester. This is probably due to increasing awareness of the mother and taking iron regularly and in properly according to advise in antenatal clinic. Faulty habit of iron intake causes no improvement of hemoglobin. The salutary effect of iron supplementation on improvement of hemoglobin levels in pregnancy has been documented in various studies, which are more similar to our study. Routine prophylaxis of iron is recommended for all pregnant women in our study.¹⁸ Progesterone therapy during the current pregnancy didn't show any relationship with anemia.

Sun exposure and living in urban area has effect on Hb level. Multi-gravida patients are vulnerable to moderate anemia, may be due to faulty diet habit or lack of care by the family. Thus, balanced diet involving meat and vegetable and eggs is essential during pregnancy in preventing anemia. In our study, all the women took eggs/fruits and milk during their current pregnancy and improved their hemoglobin level.

Several studies have found association between malaria infection and anemia in pregnancy.¹⁹ This relationship between malaria infection and anemia in pregnancy is critical in the health of women in their reproductive age especially in malaria endemic areas, but we didn't investigate this in our study, hence indicating a limitation in our study. Helminthic infestation may also play role in our population for decreased Hb level.

LIMITATIONS

This was a single centered study so actual picture did not reflected.

CONCLUSIONS

Anemia in pregnancy was a major public health problem in our study. Lack of awareness about the consequence of anemia, poor diet habit and defective iron absorption and probably undiagnosed hemoglobinopathies are the cause of anemia in pregnancy. By improving female literacy rate, sun exposure and proper advice in antenatal clinic regarding intake of iron, protein, vitamin and minerals improve the condition. Worm infestation and chronic infection should be corrected. If patient's compliance to oral iron is not satisfactory, parenteral iron should be given after exclusion of Thalassemia. Option of blood transfusion should be kept in mind. Our study finding will be useful to maternal health programmer and implementers for improvement of hemoglobin level of pregnant mothers by proper antenatal check-up and special attention to improve their hemoglobin level.

RECOMMENDATIONS

From our observation we recommend that the mothers should take oral iron with a source of vitamin C such as orange juice. Other medications or antacid should not be taken at the same time.

DISCLOSURE

The authors declared no conflicts of interest.

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