Original Article

Effect of Anemia on Pregnancy Outcome in Labour Ward: Study in a Tertiary Level Public Hospital

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Abstract

Objectives: To determine the pregnancy outcome among anemic women admitted in labour ward of a tertiary level hospital.

Methodology: This is a descriptive type of cross-sectional study. All women who were admitted at labour room for delivery with anemia and gestational age more than 28 weeks were included with purposive sampling under the GU-3 of Shaheed Suhrawardy Medical College & Hospital. Respondents were recruited on the basis of clinical findings correlating with lab investigation. Blood samples were collected during the time of admission and hemoglobin (Hb) level were tested by automated machine in the laboratory of ShSMCH. Outcome of pregnancy was observed against the anemic state defined by Hb% done in laboratory. The mother who delivered, intra-partum & post-partum observation up to 7 days were made for pregnancy outcome.

Results: This study conducted in a tertiary level public hospital, included 100 pregnant anemic mothers admitted at labor ward. Prevalence of anemia was 30.12% among the pregnant women at delivery. It revealed that women went into labor having mild anemia in 77% and moderate anemia in 23% cases. Importantly it was observed that moderate anemia was found more in younger age group. Additionally, it was also more pronounced (>50%) among the illiterate and primary education group. There was significant inverse relationship between educational status (p =.003) and anemia. Regarding family history, about two thirds anemic mother came from nuclear family and they also lives with small members. Most of the multigravida women presented with moderate anemia. Among the moderately anemic mothers' interval of pregnancy were less than two years. It has been observed that 60.9% moderate anemic mother was not on regular antenatal checkup and total 11% respondents had no antenatal checkup. Regarding maternal outcome preterm labour (PTL), premature rupture of membrane (PROM), wound infection were more among moderately anemic group. There was significant relationship between degree of anemia with birth weight (p=.014). Adverse fetal outcome like prematurity, NICU admission, IUD were found more among moderately anemic mothers.

Introduction

Anaemia is a major public health problem affecting both developed as well as the developing countries. According to World Health Organization, the prevalence of anaemia among pregnant population is around 14% in developed countries, whereas it is still as high as 51% in the developing world.[1] The condition is even worse in Southeast Asia, about half of all global maternal deaths due to anaemia occur in South Asian countries.[2] In India the prevalence of anaemia among pregnant women is about 65-75%.1 In Bangladesh among the rural population, the prevalence of anemia is 43% in adolescent, 45% in a non-pregnant and 49% in pregnant women.[3]

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Anemia is a qualitative & quantitative deficiency of Hb or red blood cell (RBC) in circulation resulting in a reduced oxygen carrying capacity of blood to organ & tissues.[4] During pregnancy due to disproportionate expansion of plasma volume in regards to RBC volume expansion, physiological anemia exists widely. The level varies in different trimester. Accommodating the physiological state, Anemia in pregnancy is defined as an Hb concentration of <11gm/dl or a hematocrit <0.33 in first trimesters, while in the second trimesters a value of 10.5gm/dl is used[5,6] as cut off point for anemia. Anemia in pregnancy can also be classified as mild (10.0-10.9 gm/dl), moderate (7.0-9.9 gm/dl) or severe (<7.0 gm/dl)

Anemia in pregnancy most commonly results from nutritional deficiency in either iron or folate.[8] Ignorance, poverty & gender bias significantly contributes to high prevalence in developing countries.[9] Most females start pregnancy with an inadequate iron reserve, remain unaware of their condition fail to take nutritional supplements or de worming agents and suffer complications during pregnancy and child birth.[7]

Early detection and effective management of anemia in pregnancy can contribute substantially to reduction in maternal mortality.[8] Higher maternal and perinatal loss is no longer acceptable. Early detection and treatment by proper antenatal care can control and prevent the development of hazardous condition which is real threat to life of both mother and fetus.[10]

General objectives

To determine the magnitude of anemia among women in labour and to estimate its association with pregnancy outcome.

Specific objectives

1. To assess anemia clinically among pregnant women during labour.

2. To determine socio-demographic condition of the respondents.

3. To find out pattern of antenatal care among those women.

4. To correlate the degree of anemia with gravid status, last interval of pregnancy and pattern of iron intake.

5. To find out the pregnancy out come in the form of preterm labour, PROM, shock heart failure, death immediately after delivery and puerperal sepsis, sub-involution and poor lactation during puerperium and in fetus about low birth weight baby, prematurity, stillborn, needs NICU admission.

Materials and Methods

This descriptive type of cross sectional study was conducted at gynae unit three in Shaheed Suhrawardy Medical College and Hospital from July to Dec 2014. All women who were clinically anemic and admitted at labour room with anemia and gestational age more than 28 weeks were included in the study. Recruitment of the patients were done by clinical examination followed by measurement of Hb % in the laboratory. The mother who delivered, follow-up was done up to 7 days of postpartum. Blood sample were collected during the time of admission and hemoglobin (Hb) level were tested by automated machine in the pathology lab of ShSMCH. Outcome of pregnancy was observed against the anemic state defined by Hb% done in laboratory. Intra-partum & Post-partum observations were made for maternal & neonatal complications.

A total of 100 patients who admitted for delivery with anemia measured clinically were considered as sample size. Data were collected by pretested structured questionnaire and all relevant information collected in the predesigned data sheet and analysis was done by SPSS (version-20)

This study received approval from Ethics Committee. The aim and objective of the study along with its procedure, methods, risk and benefit of the study were explained to the respondents in easily understandable local language and then informed consent was taken from each patient. It was assured that all information and records would be kept confidential and the procedure was helpful for both the physicians and the patients is making rational approach of the case management.

Inclusion criteria

Pregnant women with gestational age more than 28 wks of gestation.

Exclusion Criteria

- Thallasaemia
- Sickle cell anemia
- Women with APH
- Pregnancy induced hypertension
- Diabetis
- Heart disease
- Multiple pregnancy
- Preeclampsia & eclampsia
- Traumatic postpartaum haemorrhage

Result

Total number of delivery were 332, among them 100 were found clinically anemic during study period. So, the proportion of anemia was 30.12%. Among the anemic

mother during delivery It was found 73% had mild anemia, 25% had moderate and only 2% had severe anemia clinically (Fig-1).
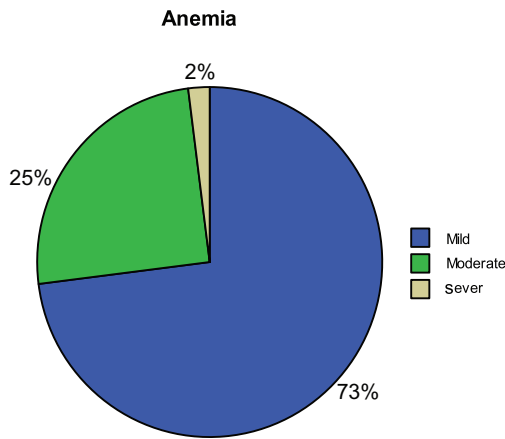
Anemia

Fig 1: Clinically estimated anemia among the respondents.

According to Hb% level, 77% had mildly anemic and 23% had moderate anemia. Overall mean hemoglobin level was measured as 9.52 ± 0.86 SD.

In this study anemia is more in younger groups. About three fourth patients were in 18 – 27 yrs age groups. Their mean age was 25.01±4.81 SD with minimum and maximum as 18 and 40 years respectively (Table-I).

Severity of anemia is more pronounced in illiterate women and those who were educated less than secondary level. Chi-Square test shows significant (p=.003) relationship between education and degree of anemia and there was significant (p=.049) relationship between monthly family income and degree of anemia.

In this study we found that 11% of respondents did not receive any antenatal care and 36 % had irregular care. Over half (53%) had regular ANC, among them 13.2% were moderate anemic. Among moderate anemic patients 69% had either no ANC or in irregular checkup. (Table-II). It is observed that among the respondents 37% were primi gravida and rest 63 % were multi gravida. Respondents of multi gravida comparatively suffered more (27.0%) with moderate anemia. Over half (58%) patients had term, 32% had preterm and only 10 percent had post term pregnancy.

Among the respondents 30% had pre term labor, 17% had PPH, 19% had PROM, 13% had wound infection. Adverse pregnancy outcome found more among moderately anemic group in comparison to mildly anemic group (Table-III).

Thirty nine percent respondents had low birth weight (<2.5 kg). Among the moderately anemic group 60.9% had low birth weight. Here was significant (p=.014) relationship between birth weight and degree of anemia (Table IV).

Table-I

Age distribution of patients							
Age of patients	Mild			Moderate			Total
	N	Row %	Col %	N	Row %	Col %	
≤20	12	70.6	15.6	5	29.4	21.7	17
21 – 25	36	76.6	46.8	11	23.4	47.8	47
26 – 30	19	79.2	24.7	5	20.8	21.7	24
31 – 35	7	77.8	9.1	2	22.2	8.7	9
36 - 40	3	100.0	3.9	0	0.0	0.0	3
Total	77	77.0	100.0	23	23.0	100.0	100

Mean age = 25.01 ± 4.81 SD, Range = 18 – 40

Table-II

Pattern of antenatal care							
Antenatal care	Mild			Moderate			Total
	N	Row %	Col %	N	Row %	Col %	
None	9	81.8	11.7	2	18.2	8.7	11
Irregular	22	61.1	28.6	14	38.9	60.9	36
Regular	46	86.8	59.7	7	13.2	30.4	53
Total	77	77.0	100.0	23	23.0	100.0	100

Table-III

Distribution of maternal outcome (multiple response)

Maternal outcome	Mild		Moderate		Total
	N	%	n	%	
Preterm labour	22	28.6	8	34.8	30
PPH	15	19.4	2	8.7	17
PROM	14	18.1	5	21.8	19
Wound Infection	10	12.9	3	13.0	13
Puerperal pyrexia	5	6.5	3	13.0	8
UTI	3	3.9	1	4.3	4
Sub involution			2	8.7	2
Sepsis	1	1.3			1
Failure of lactation	1	1.3			1
Blood transfusion	22	28.6	5	21.7	27

Table-IV

Cross table of birth weight and degree of anemia

Anemia / Birth weight	Mild			Moderate			Total
	n	Row %	Col %	N	Row %	Col %	
< 2.5 kg	25	64.1	32.5	14	35.9	60.9	39
≥2.5 kg	52	85.2	67.5	9	14.8	39.1	61
Total	77	77.0	100.0	23	23.0	100.0	100

Chi-Square test χ^2 (chi-square) = 6.005,   P-value = .014,   Comment: Significant

Table-V

Distribution of fetal outcome for anemia (multiple)

Fetal outcome	Mild		Moderate		Total
	N	%	n	%	
Prematurity	22	28.6	9	39.1	31
Needs NICU admission	11	14.3	7	30.5	18
IUGR	3	3.9	3	13.0	6
IUD	0		2	8.7	2

The study exhibits 31% had pre maturity, 18% baby needed NICU admission, 6 % had IUGR and only 2 percent had IUD. Among the moderate group 39.1% neonates were premature. It was found that IUD, IUGR and NICU admission comparatively more frequently among the moderate anemic patient (Table-V).

Discussion

Anemia is more prevalent in the developing world, where under nutrition and infection are more frequent and access to health may be more difficult.   According to the data of World Bank 2011, prevalence of anemia is 48% in Bangladesh.

In this study the proportion of anemia in pregnant women at delivery was 30.12% it should not be the exact scenario of our country because this study was done in a unit of Obstetrics and Gynaecology department of a tertiary center. Assumption of state of anemia by careful clinical examination is an important aid to detect anemia in pregnancy and it fits well with laboratory test. In this study 73%, 23% and only 2% mild, moderate and severe anemia

were found clinically among the pregnant women during labour (Fig-1). Among those no severe anemia was found by Hb measurement.

In this study age of the anemic mother ranges from 18-40 years, mean age was 25.01± 4.81SD. Maximum 38% of the patient were in 18-22 age group. Regarding severity of anemia it is evident that moderate anemia is more in young age group (Table-I). According to the state of world population report 2013, in Bangladesh most of the girls give birth to two children before reaching 18years. OA. Idow observe higher prevalence of anemia recorded among the teenage mother (15-19 yrs) which is comparable with this study[11]. Pankaj. kumar had showed most of the anemic women were 21-25 yrs age group.[12]

Regarding the educational background, among the illiterate mother 53.8% were moderately anemic, rest 46.2% were mildly anemic. There was significant (p= .003) relationship between education and degree of anemia Rizwan F.43 observed uneducated (82.88%) were anemic while educated (45%) were anemic. Jamia Haniff et al found anemia in cases having less than secondary, secondary and tertiary level of education 61.2%, 20.8%, 18.0% respectively[22]. OA.Idow observed anemia was found among 58% pregnant women at HSC level.[21] Our government took different initiative to improve the literacy rate of female to 52.2% in 2010. We can expect along with other health indices, anemia during pregnancy will decline if we can improve our educational status.

This study revealed that low income group were mostly sufferings from moderate anemia. There was significant (p = .049) relationship between monthly family income and degree of anemia. A correlation between maternal Hb and family income suggests under nutrition may have played an important role. Jamiayah Haniff et al found anemia in lower, middle and upper social class family as 56.1%, 22.8% and 21.1% respectively.[22]

Antenatal care has substantial impact on degree of anemia. According to this study (Table-II) those 11% respondents who had no antenatal checkup, among them only 18.2% suffered moderate anemia can be explained by low number of respondents in this group, presence or absences of other contributing factor like education, age, family income etc. maybe responsible factor. Who were in regular (53%) antenatal checkup they have avoided moderate anemia in most of the cases while those who received irregular ANC (36%) suffered from moderate anemia i.e. 60.9%. Pankaj kumar et al. observed anemia among female with < 3 follow –up visit, which show similarity with this study.[12] So, it was revealed that pregnant women suffered more from anaemia who did not have regular antenatal checkup.

Multi gravida comparatively suffered more (27.0%) in moderate anemia. The difference in severity of anemia between parity was due to repeated pregnancy at short interval along with prolong period of lactation. As we know a term pregnancy needs at least two years to replenish the loss. It was observed that 34.8% moderate anemic women became pregnant with in 2 years. Elena L. et al. in relation to parity anemia was recorded as in 1st birth 56.3%, 2nd birth 57.4% and more than 3rd birth in 56.7% cases.[15]

Half of the respondents took iron supplementation irregularly. Moderate anemia was found (18.4%) among those who took iron regularly (38%). 12% respondents did not took any iron supplementation. It is evident that who took iron supplementation irregularly were suffering more in moderate anemia 60.9%. So, routine use of iron supplementation by pregnant women can reduce the consequences of anemia.

Regarding outcome of the mothers (Table III) 30%, 19%, 17%, 13% and 8% had preterm labour, PROM, PPH, wound infection and puerperial pyrexia respectively. Among them 34.8%, 21.7%, 13.0% preterm labour, PROM and wound infection found more in moderate anemic mothers than the mild anemic one. It was found that sub involution 100% occurred among moderate anemic mother. Sepsis and failure of lactation 1.3% only found in mild anemia it may be associated with other cause also. Blood transfusion were required in 27% of anemic mothers. Mousumi Gogoi found U-shape relationship exsisting between maternal anemia and preterm delivery.[16] M. Rohilla show 18.75% had preterm premature rupture of membrane among them 5.12% of all deliveries were preterm.[17] PPH is more in anemia due to anemic patient has less tissue perfusion and oxygen is necessary for contraction of uterine muscle. So anemic patient develop atonicity of uterus due to anoxia that causes PPH. It was found among 2 1.5% in mild and 8.69% in moderate anemic mother in this study. This is probably due to more emphasis given to the moderate anemic mother and also treated by blood transfusion. Rifat Jalel observed PPH occurred in 9.8% of cases as compared to 0.9% of controls (p = 0.013). Frequency of infection was 7.8% and none in controls (p = 0.010). This study show 13.04 % had wound infection among moderately anemic mothers. M. Rohilla found PPH was seen in 25.5% of anemic patient which is almost similar to our study.[17]

Regarding fetal outcome, low maternal hemoglobin and iron deficiency may induce fetal hypoxia, maternal and fetal stress or increase in synthesis of the corticotrophin releasing hormone, which in turn is associated with pre-term labour. Moreover, iron deficiency may increase the

risk of preterm birth. Maternal anemia may also increase fetal cortisol production which is an inhibitor of fetal growth[17]. From this study, It was observed, 39% respondents had low birth weight among those 35.9% were moderate anemic and rest were mildly anemic. Chi square test shows significant (p = .014) relationship with birth weight and degree of anemia (Table-IV). It was observed (Table-V) 31%, 6%, 2% as prematurity, IUGR and IUD among the respondents and 18% new born needs NICU admission. IUD occurs among moderately anemic group. Kalvani K. found a doubling of low birth rate and 2-3 fold increase in the perinatal mortality was seen when Hb is < 8gm/dl which follow this example.[19] Akter. S. observed that maternal Hb had a significant correlation with birth weight (r =0.35; p = 0.001). M. Rohilla observed 33.33% had small for gestational age neonates, 16.66% had still births and 4.16% neonatal death.[17] All these findings correlates with those of present study.

Conclusion

Present study revealed that many women (30.12%) go into labour with anemia. Adolescent pregnancy, educational status and monthly family income are also important contributing factors for anemia. Present study confirms the importance of antenatal checkup. Alarming findings conclude that 60.9% moderately anemic mother was not on regular antenatal checkup. Among the respondents 69.5% suffered mostly from higher grade of anemia. Preterm labour, PROM, wound infection and puerperial pyrexia were found more in moderately anemic mothers. There was a significant association of anemia with low birth weight. IUD, IUGR and NICU admission were found comparatively more among the moderate degree of anemia. As the severity of anemia progressed, adverse effect on the mother and fetus became more obvious.

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