

An Observational Assessment of the Impact of Maternal Anemia on Perinatal Outcome

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Conflict of interest: Nil

Abstract

Aim: The aim of the present study was to find the impact of maternal anemia on perinatal outcome.

Methods: The present study was conducted in the Department of community medicine, JNKTMC, Madhepura, Bihar, India from Jan 2021 to December 2021 and 100 patients were included in the study.

Results: Most (43% & 39%) of the pregnant women were in the 25-29 & 20-24 yrs of age group. Only 9% of the pregnant women were less than 20 years of age and 9% were more than 30 years. As the level of education increased, severity of anemia decreased although the difference is not statistically significant. Most of the patients were second gravid i.e. 44%. Most the pregnant women were moderately anemic i.e. 49% followed by mild (45%) and severe (4%) respectively. Among the pregnant women most common type of anemia is Iron deficiency anemia (69%) followed by Sickle cell anemia (16%) and other cause (11%). The distribution of various maternal outcome related to anemia, in which most common found to be low birth weight (31%) followed by premature delivery (24%). The distribution of various fetal outcome in anemic mother in the form of preterm (15%) followed by NICU admission (13%) and FGR (9%).

Conclusion: Anemia being one of the most important cause of poor fetal outcome should be treated preconceptionally. There is a need of health education programmes and adequate intake of iron rich diet during pregnancy, to be strengthened for safe maternal and fetal outcomes.

Keywords: Anemia, Prevalence, Pregnant women, Preterm delivery, LBW, Still birth

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Introduction

Anemia is one of the most common nutritional deficiency disorders affecting the pregnant women. The prevalence in developed countries is 14%, in developing countries 51%, and in India, it varies from 65% to 75%. [1,2] Most of the reported anemia mothers are in third trimester of pregnancy, since the iron demand reaches 6.6 mg/day in this period as there is disproportionate increase in plasma volume and red cell mass causes hemodilution and it lowers the hemoglobin level. Anemia during pregnancy is commonly associated with poor pregnancy outcome and may lead to complication of mother like Prolonged labour and increase incidence of post-partum hemorrhage and also lead to preterm birth, low birth weight and small-for-gestational age babies and prematurity. [3-5]

According to the WHO, in developing countries, the prevalence of anemia among pregnant women averages 56%, ranging between 35% and 100% among different regions of the world. [6] It is now one of the most frequently observed nutritional

diseases in the world. It is especially prevalent in women of reproductive age, particularly during pregnancy. In one of the studies conducted on a large population, it was estimated that 87% of the Indian pregnant women are anemic. [7] The extent up to which maternal anemia affects maternal and neonatal health is still uncertain. [8] Iron deficiency during pregnancy is thought to be caused by a combination of factors such as previously decreased iron supply, the iron requirements of growing fetus and expansion of maternal plasma volume. [9]

WHO has estimated that prevalence of anemia in developed and developing countries in pregnant women is 14 percent in developed and 51 per cent in developing countries and 65-75 percent in India alone. [10] Maternal anemia in pregnancy is commonly considered as risk factor for poor pregnancy outcome and can threaten the life of mother and fetus. [11] Anemia during pregnancy is commonly associated with poor pregnancy outcome and may lead to complication of mother like

Prolonged labour and increase incidence of post-partum hemorrhage and also lead to preterm birth, low birth weight and small-for-gestational age babies and prematurity. [4,12] Anemia was classified based on the WHO criteria; HB concentration of <11 g/dl was considered as anemia. HB concentration of 10–10.9 g/dl, 7–9.9 g/dl, and <7 g/dl was considered as mild, moderate, and severe anemia, respectively. The extent up to which maternal anemia affects maternal and neonatal health is still uncertain. [13] Iron deficiency during pregnancy is thought to be caused by a combination of factors such as previously decreased iron supply, the iron requirements of growing fetus and expansion of maternal plasma volume. [14]

The aim of the present study was to find the impact of maternal anemia on perinatal outcome.

Methods

The present study was conducted in the Department of Community Medicine, JNKTMC, Madhepura, Bihar, India from Jan 2021 to December 2021 and 100 patients were included in the study.

Data collection was done from the records maintained by hospital. All the subjects were classified according to WHO criteria were hemoglobin estimation done by Sahli’s method and treatment details i.e oral iron or intravenous iron or blood transfusion, the modes of delivery, maternal and perinatal outcome were collected from records.

We included all the women who fulfilled the following inclusion criteria:

- attended the outpatient clinic before 16 weeks of gestation

- age 16 years and above
- singleton pregnancy
- had complete medical records of the pregnancy.

Women with a past history of preterm delivery, obstetric complications or medical illnesses, except anemia, were excluded.

Exposure (anemia) was defined as hemoglobin level of < 11 g/dL in labor and on 2 previous occasions in the current pregnancy. Women were interviewed in the local language on the second day of delivery and the data from the interview and medical records were recorded on a pre-designed questionnaire. During antenatal care, height and weight were recorded at each antenatal visit and hemoglobin level was measured at the first antenatal visit, at 28 to 32 weeks, at 33 to 37 weeks and in labor. Women who had hemoglobin < 11 g/dL were given oral iron; those with hemoglobin < 7 g/dL in the third trimester were given either blood transfusion or intravenous iron therapy. Information regarding gestational age at delivery, perinatal outcome (live birth, stillbirth, intrauterine death), intrauterine growth retardation

(IUGR) and the type of IUGR were noted from the medical records. Health status of the neonate, and perinatal mortality and its cause were documented.

Data Analysis

The data were recorded in an excel sheet and descriptive analysis was performed and results were expressed in numbers and percentage.

Results

Table 1: Demographic details

Age in years	N%
<20	9 (9)
20-24	39 (39)
25-30	43 (43)
>30	9 (9)
Education	
Illiterate	13 (13)
Primary	15 (15)
Middle	21 (21)
High school	29 (29)
Intermediate	21 (21)
Graduate	1 (1)
Parity status	
Primi gravida	31 (31)
Second gravida	44 (44)
Multigravida	25 (25)
Degree of anaemia	
Mild	45 (45)
Moderate	49 (49)
Severe	6 (6)

Most (43% & 39%) of the pregnant women were in the 25-29 & 20-24 yrs of age group. Only 9% of the pregnant women were less than 20 years of age and 9% were more than 30 years. As the level of education increased, severity of anemia decreased

although the difference is not statistically significant. Most of the patients were second gravid i.e. 44%. Most the pregnant women were moderately anemic i.e. 49% followed by mild (45%) and severe (4%) respectively.

Table 2: Type of Anemia wise distribution of cases

Type of Anemia	N%
Iron Deficiency Anemia	69 (69)
Sickle cell anemia	16 (16)
Thalassemia	1 (1)
Dimorphic anemia	2 (2)
Megaloblastic anemia	1 (1)
Others	11 (11)

Among the pregnant women most common type of anaemia is Iron deficiency anaemia (69%) followed by Sickle cell anaemia (16%) and other cause (11%).

Table 3: Maternal outcome

Complication during pregnancy	N%
Low birth wt.	31 (31)
Obstructed labor	1 (1)
Prolonged labor	3 (3)
Premature delivery	24 (24)
Preeclampsia	3 (3)
PPH	2 (2)
LSCS	36 (36)

The distribution of various maternal outcome related to anemia, in which most common found to be low birth weight (31%) followed by premature delivery (24%).

Table 4: Fetal outcome

Fetal outcome	N%
Full term delivery	62 (62)
Preterm delivery	15 (15)
IUD	1 (1)
FGR	9 (9)
NICU admission	13 (13)

The distribution of various fetal outcome in anemic mother in the form of preterm (15%) followed by NICU admission (13%) and FGR (9%).

Discussion

Anemia is a common problem in pregnant women in developing countries. The pregnancy outcomes show a variation depending upon the type of anemia. Studies have demonstrated differences in outcomes in iron deficiency as compared to physiological anemia of pregnancy. [15] In populations where the rate of anemia is low among non-pregnant women, the primary cause of anemia during pregnancy is likely to be plasma volume expansion, and this type of anemia is not associated with negative birth outcomes. [16] Maternal hemoglobin values during pregnancy are associated with LBW and preterm birth in a U-shaped relationship with high rates of

LBW at low and high concentrations of maternal hemoglobin. However, some of this association may result from using "lowest hemoglobin" rather than a hemoglobin value controlled for the stage of pregnancy.

Most (43% & 39%) of the pregnant women were in the 25-29 & 20-24 yrs of age group. Only 9% of the pregnant women were less than 20 years of age and 9% were more than 30 years. As the level of education increased, severity of anemia decreased although the difference is not statistically significant. Most of the patients were second gravid i.e. 44%. Most the pregnant women were moderately anemic i.e. 49% followed by mild (45%) and severe (4%) respectively. This was comparable with the results of Alli R et al. the percentage of anemic women in his study was 40% in the same age group

and Upadhyay C et al which was 46.7%. [17,18] Maternal anemia is considered as risk factor for poor pregnancy outcomes, and it threatens the life of fetus. Available data from India indicate that maternal morbidity rates are higher in anemic women. [7,19] In India, anemia is one of the most common causes of maternal death, accounting for 20% of total maternal deaths. [20]

The distribution of various fetal outcome in anemic mother in the form of preterm (15%) followed by NICU admission (13%) and FGR (9%). These were comparable with the observation of Upadhyay C et al were Preterm deliveries was 20%, IUGR 11.5% and IUD 3% and Awasthi A et al PT (9.5%), IUGR (37.5%) and IUD (8%) and also comparable with Rangnekar et al PT (73%), IUGR (4%) and IUD (16%). [18,21,22] Among the pregnant women most common type of anemia is Iron deficiency anemia (69%) followed by Sickle cell anemia (16%) and other cause (11%) which was similar to the incidence of sickle cell anemia in Chhattisgarh as shown in study of Lagoo J et al. (17%). Similarly, Cochrane review 2009 shows that microcytic hypochromic anemia resulting from iron deficiency is the most frequent form of anemia (76%), followed by folate deficiency (20%) and combined iron and folate deficiency (20%). [23,24] The distribution of various maternal outcome related to anemia, in which most common found to be low birth weight (31%) followed by premature delivery (24%) which was similar to the study by Nair et al. [25]

Conclusion

Anemia is usually ignored in pregnant females in our rural population and poor communities of our cities, but this is a serious alarm for both mother and the baby and needs to be dealt on priority basis. To improve maternal and fetal outcome it is recommended that primary health care has to be strengthened, emphasizing the importance of consumption of iron and folic acid in pregnancy. So, the only way to reduce these complications is early screening for anemia and giving proper, effective treatment and counseling about the same.

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