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Original Research Article

Analyzing the Prevalence and Consequences of Anemia during Pregnancy within a Tertiary Health Care Setting in Bihar

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Abstract:

Background: Anaemia is the leading cause of maternal morbidity and mortality in developing countries. It is now one of themost frequently observed nutritional diseases in the world. It is especially prevalent in women of reproductive age, particularly during pregnancy.

Materials and Methods: This is hospital-based observational study all mothers admitted for delivery and diagnosed withanemia are recruited for the study, meeting the inclusion and exclusion criteria were considered as the study population. Study in the Department of DMCH, Darbhanga Bihar. Study duration Three year.

Conclusions: The prevalence of anemia was 28.28%. It was low compared to NHFS and also other studies in the literature. Majority of the cases were mildly anaemic, so there were no significant complications seen.

Keywords: Anaemia in pregnancy, morbidity, mortality.

Introduction

Anaemia is the leading cause of maternal morbidity and mortality in developing countries. It is now one of the mostfrequently observed nutritional diseases in the world. It is especially prevalent in women of reproductive age,particularly during pregnancy According to the WHO, in developing countries, the prevalence of anemia amongpregnant women averages 56%, ranging between 35% and100% among different regions of the world. [1] In one of the studies conducted on a large population, it was estimated that 87% of the Indian pregnant women are anemic. [2] All these showed that over 70 percent of preschool children were anaemic. NNMB, DLHS and ICMR surveys showed that over 70 per cent of pregnant women andadolescent girls in the country were anaemic. [3] Anaemiabegins in childhood, worsens during adolescence in girls and gets aggravated during pregnancy. Healthy pregnancyin women requires a minimum of 500mg of iron in the bodyto meet up needs of gestation without any iron supplementation. Because of high metabolism duringpregnancy, this store of iron is completely used till the endof pregnancy. [4] 700-1400mg of iron is usually needed in pregnant women. Daily usage of iron raises from 4mg-6mgto 6-8mgs. [5] World Health Organization defines anemia as hemoglobin less than 11gm/dl in the 1st and 3rd trimesterand less than 10.5 gm/dl in 2nd trimester. [6] Anaemia is further classified into mild, moderate and severe by ICMR depending upon the levels of hemoglobin. Iron deficiency during pregnancy has multifactorial etiology. Anemia in pregnant women has been regarded as detrimental to fetal growth and pregnancy outcomes. Low birth weight (LBW)and preterm delivery have been persistently linked to anemia in pregnancy. [7,8] The main causes of anemia in developing countries include inadequate intake and poor absorption of iron, the iron requirements of growing fetus and expansion of maternal plasma volume, malaria, hookworm infestation, diarrhea, HIV/AIDS and other infections, genetic disorders (e.g., sickle cell and thalassemia), blood loss during labor and delivery, heavy menstrual blood flow, and closely spaced pregnancies. [9] Other factors like socio-demographic factors include faultydietary habits, increased iron demand, low immunity, compounded by physiological changes of pregnancy contribute to anemia in pregnancy. [10] Amemia causes direct as well as indirect deaths from cardiac failure, hemorrhage, infection, and pre-eclampsia.

[11] It also increases perinatal morbidity and mortality ratesdue to an increase in pretermbirths and in-utero growth restriction.

Objectives: To determine the Prevalence and outcomes of Anaemia inpregnancy

Material and Methods

This study was a hospital-based observational study. The study was conducted in the department of Department of Obstetrics and Gynecology, at Darbhanga Medical College and Hospital, Darbhanga, Laheriasarai, Bihar. Study duration, two years, the data collection for the study was done. All the mothers admitted for delivery and diagnosed with anemia are recruited for the study, meeting the inclusion and exclusion criteria were considered as the study population.

Inclusion Criteria: Singleton gestation, Pregnant women who were diagnosedto have anaemia(</= 10.9) and delivered in our hospital.

Exclusion Criteria: Obstetric complications- Multiple pregnancy, Diabetes Mellitus/ Hypertension / hemoglobinopathies /renal condition/ hepatic disorders/ thyroid disorders/ bronchial asthma/ epilepsy/smoker/alcohol consumption.

The mothers admitted for delivery were subjected to a detailed history, general physical, systemic examination followed by obstetric examination along with relevant investigations were carried out in the hospital. Mothers diagnosed with iron deficiency anaemia were recruited forthe study and then the prevalence and maternal and fetal outcomes were studied.

Statistical Methods

Maternal complications, Apgar score, NICU admissionwere considered as primary outcome variables. Anaemia groups (mild Vs Moderate Vs severe) was considered as Primary explanatory variable.

Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency, and proportion for categorical variables. Non-normally distributed quantitative variables were summarized by the median and interquartile range (IQR). Data was also represented using appropriate diagrams like a bar diagram,pie diagram.

Results

Total 1404 women delivered in our hospital during the study period. Among the population, 397 (28.28%) were included as they were anaemic, 1007(71.72%) were excluded.

Descriptive prevalence of anaemia in general population (N=1404)

Table 1:

Anaemia	Frequency	Percentages
Yes	397	28.28%
No	1007	71.72%

Among the study population, 338 (85.14%) were included.59 (14.86%) were excluded due to Diabetes Mellitus/ Hypertension /renal condition/ thyroid disorders/ bronchial asthma/ epilepsy. A total of 338 subjects were included in the final analys.

Table 2: Descriptive prevalence of anaemia in the study population (N=397)

Prevalence of anaemia	Frequency	Percentages
Included	338	85.14%
Excluded	59	14.86%

Among the mild anaemia, 48 (21.52%) were consumption of iron with milk and 175 (78.48%) were consumption of iron with water. Among the moderate anaemia, 27 (25.23%) were consumption of iron with milk and 80 (74.77%) were consumption ofiron with water. Among the severe anaemia, 4 (50%) were with milk and 4 (50%) were with water. The difference in the proportion of consumption of iron with milk and water across anaemia was statistically not significant (P-value 0.150)

Comparison of consumption of iron with milk or water across anaemia (N=338)

Table 3:

Consumption of iron with Milk or Water	Anaemia			Chi-square	P-value
	Mild (N=223)	Moderate (N=107)	Severe (N=8)		
Milk	48 (21.52%)	27 (25.23%)	4 (50%)	3.799	0.150
Water	175 (78.48%)	80 (74.77%)	4 (50%)		

Among the mild anaemia, 9 (17.65%) were Anaemic sincethe 2nd trimester and 42 (82.35%) were anaemic since 3rd trimester. Among the moderate anaemia, 17 (27.87%) wereanaemic since the 2nd trimester and 44 (72.13%) were anaemic since the 3rd trimester. Among the severe anaemia,3 (60%) were anaemic since the 2nd trimester and 2 (40%) were anaemic since the 3rd trimester. Among the mildanaemia, 1 (1.96%) were treated with blood, 44 (86.27%) were treated with oral iron and 6 (11.76%) were treated with parenteral. Among the moderate anaemia, 6 (9.84%) were treated with blood, 40 (65.57%) were treated with oral iron and 15 (24.59%) were treated with parenteral. Among the severe anaemia, 1 (20%) were with blood, 1 (20%) were with oral iron and 3 (60%) were treated with parenteral. Among the mild anaemia, 35 (15.7%) period of gestation was <37 and 188 (84.3%) period of gestation was >=37. Among the moderate anaemia, 13 (12.15%) period of gestation was <37 and 94 (87.85%) period of gestation was>=37. Among the severe anaemia 4 (50%) period of gestation was <37 and 4 (50%) period of gestation was>=37. Among the mild anaemia, 128 (57.4%) were with normal delivery, 93 (41.7%) were with LSCS and 2 (0.9%) were with instrumental. Among the moderate anaemia, 60 (56.07%) were with normal delivery and 47 (43.93%) were with LSCS. Among thesevere anaemia, 4 (50%) were with normal delivery and 4 (50%) were with LSCS. Among the mild anaemia, 19 (8.52%) were with infections, 1 (0.45%) were with antepartum haemorrhage, 3 (1.35%) were with poor wound healing and 1 (0.45%) were with pre-eclampsia. Among the moderate anaemia, 7 (6.54%) were with infections, 1 (0.93%) were with antepartum haemorrhage, and 2 (1.87%) were with pre- eclampsia. Among the severe anaemia, 1 (12.5%) had infections. Among the mild anaemia, 5 (2.24%) were aged between 1-1.59 kg, 8 (3.59%) were aged between 1.6-2.09 kgs, 39 (17.49%) were aged between 2.10- 2.59 kgs, 69 (30.94%) were aged between 2.60-3 kgs and 102 (45.74%) were aged more than 3 kgs.Among the moderate anaemia, 1 (0.93%)were aged between 1-1.59 kg, 2 (1.87%) were aged between 1.6-2.09 kgs, 26 (24.3%) were aged between 2.10-2.59 kgs, 36 33.64%) were aged between 2.60-3 kgs and 42 (39.25%) were aged more than 3 kgs. Among the severe anaemia, 1 (12.5%) were aged between 1.6-2.09kg, 6 (75%) wereaged between 2.10-2.59 kgs and 1 (12.5%) were aged more than 2.60-3kgs. Among the mild anaemia, 200 (89.69%) had apgar score and 23 (10.31%) had poor apgar scores.

Discussion

anaemia is the second most common cause of maternal deaths, accounting for 20% of total maternal deaths. Anaemia affects mainly the women in child bearing age group, young children and adolescent girls. [12] Apart from the risk to the mother, it is also responsible for the increased incidence of premature births, low birth weight babies and high perinatal mortality. [13] The incidence of anemia in pregnancy ranges widely from 40% to 80% in the tropics compared to 10% to 20% in the developed countries. The current study is conducted to determine the prevalence and outcomes of anaemia in pregnancy in a tertiary health care, Among a total of 1404, 397 (28.28%) were anaemic and 1007 (71.72%) were not anaemic, hence excluded. In Animesh Gupta's study population, the prevalence of maternal anemia was high at 60.38%.[8] Available studies on the prevalence of nutritional anemia in India show that 85% of pregnant women are having anaemia with 9.9% of them having severe anemia. Further, 59 (14.86%) among the anaemic group were excluded due to Diabetes Mellitus, Hypertension, renal conditions, thyroid disorders, bronchial asthma and epilepsy. [14] A total of 338 pregnant women with singleton gestation who were diagnosed to have anaemia (</= 10.9) were included in the final analysisof maternal and fetal outcome. Among 338, 65.98% were found to have mild anaemia, 31.66% moderate anaemia and 2.37% were with severe anaemia almost similar to those in S Bisoi's study population where 50.9% had mildanaemia, 12.4% moderate and 4.5% severe. The proportionof anaemic women is much less in our study than that in Nazia hashim et al's study population where patients with moderate anaemia were 83% and 17% ofthe women had severe anaemia. among the mild anaemia group, 15.7% hada period of gestation <37 weeks and 84.3% had a period of gestation >=37 weeks. [15] Among the moderate anaemia group, 12.15% had a period of gestation <37 weeks and 87.85%had a period of gestation >=37 weeks. Among the severe anaemia group, 50% had a period of gestation <37 weeks and 50% had a period of gestation >=37 weeks. Higher rates of preterm deliveries (<37 weeks gestation) and low birthweight (<2500 g) were found among patients with anemia as compared to the non-anemic women in Levy et al's study group. Severe anemia was associated with a significantly increased risk of low birth weight(<2500 g) and preterm delivery (<37 weeks gestation) in G. T. Bondevik et al's group too. Among the mild anaemia group, 35.87% were with Microcytic Hypochromic,31.84%were with Normocytoc Normochromicand 7.62% were with Dimorphic anaemia. [16] Among the moderate anaemia, 28.04% were with MCHC, 37.38% were with NCHC and 8.41% were with DA. Among the severe anaemia, 75% were with MCHC and 25% were with DA. [17] Among the mild anaemia, 8.52% had infections, 0.45% had an antepartum haemorrhage, 1.35% had poor wound healing and 0.45% had pre-eclampsia. Among the moderate anaemia, 6.54% had infections, 0.93% had antepartum haemorrhage and 1.87% had pre-eclampsia. Among the severe anaemia, 12.5% had infections [18,19]. The prevalence of low birth weight baby was 8.36%, and the proportion was higher in mothers who had moderate anemia (50.60%) in Animesh Gupta's study

population. In the study by Manpreet Kaur et al, 48% of the neonates weight> 2.5kg, 34% weighed 1.50-2.49 kg, 14% weighed 1.0-1.49 kg and 4% weighed <1.0 kgborn of anaemic mothers showing maternal haemoglobin has a positive relationship with the neonatal measures of weight. Low birth weight among neonates born to anaemic mother was found in 24.8% of them in a study by Shilpa Sapre et al [20,21].

Conclusion

The prevalence of anemia was 28.28 0%. It was low compared to NHFS and also other studies in the literature.The majority of the cases were mildly anaemic, so there were no significant complications seen.

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