

PREVALENCE AND OUTCOME OF ANEMIA IN PREGNANCY IN A TERTIARY HEALTH CARE 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 the most 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 with anemia 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 most frequently 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 among pregnant women averages 56%, ranging between 35% and 100% 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. 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 and adolescent girls in the country were anaemic. Anaemia begins in childhood, worsens during adolescence in girls and gets aggravated during pregnancy. Healthy pregnancy in women requires a minimum of 500mg of iron in the body to meet up needs of gestation without any iron supplementation. Because of high metabolism during pregnancy, this store of iron is completely used till the end of pregnancy. 700-1400mg of iron is usually needed in pregnant women. Daily usage of iron raises from 4mg-6mg to 6-8mgs. World Health Organization defines anemia as haemoglobin less than 11gm/dl in the 1st and 3rd trimester and less than 10.5 gm/dl in 2nd trimester. 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. 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 faulty dietary habits, increased iron demand, low immunity, compounded by physiological changes of pregnancy contribute to anemia in pregnancy. Anemia causes direct as well as indirect deaths from cardiac failure, hemorrhage, infection, and pre-eclampsia.¹¹ It also increases perinatal morbidity and mortality rates due to an increase in preterm births and in-utero growth restriction.

Objectives

To determine the Prevalence and outcomes of Anaemia in pregnancy

Review of Literature

Maternal mortality rate is one of the major causes of death worldwide. In the International statistical classification of diseases and related health problems, 10th revision (ICD-10) (9), WHO defines maternal death as: The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. This definition allows identification of maternal deaths, based on their causes, as either direct or

indirect. Direct maternal deaths are those resulting from obstetric complications of the pregnant state (pregnancy, delivery and postpartum), interventions, omissions, incorrect treatment, or a chain of events resulting from any of the above. Indirect maternal deaths are those resulting from previously existing diseases, or from diseases that developed during pregnancy and that were not due to direct obstetric causes but aggravated by physiological effects of pregnancy. Maternal anaemia is one of the main reasons for maternal mortality. The prevalence of anaemia in South Asian countries is among the highest in the world. It is obvious that India's contribution both to the prevalence of anaemia in pregnancy and maternal deaths due to anaemia is higher than warranted by the size of its population. So five major surveys have been conducted five major surveys (National Family Health Survey (NFHS) and, District Level Household Survey (DLHS), Indian Council of Medical Research (ICMR) Micronutrient Survey and Micronutrient Survey conducted by National Nutrition Monitoring Bureau (NNMB)⁶ were undertaken to estimate prevalence of anaemia in the country. All these showed that over 70 per cent of preschool children were anaemic. The immune status of the women with anemia was also deteriorated. Studies undertaken by the National Institute of Nutrition, Hyderabad, showed that there was a fall in T and B cell count with a fall in haemoglobin levels below 11 g/dl. The fall in T and B cells was statistically significant in women with haemoglobin levels below 8 g/dl. Immunoglobulin levels showed a progressive rise with decreasing Hb levels. The main risk factors of IDA are inadequate iron intake (due to an iron-deficient diet or inadequate absorption), increased iron requirements, and blood loss. They concluded that the daily diet must include sufficient amounts of high bioavailable iron to combat anemia.

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 diagnosed to 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 for the study and then the prevalence and maternal and fetal outcomes were studied.

Statistical Methods:

Maternal complications, Apgar score, NICU admission were 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)

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 analysis

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 of iron 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)

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 since the 2nd trimester and 42 (82.35%) were anaemic since 3rd trimester. Among the moderate anaemia, 17 (27.87%) were anaemic 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 mild anaemia, 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%) were aged 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. 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. 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. A total of 338 pregnant women with singleton gestation who were diagnosed to have anaemia (<= 10.9) were included in the final analysis of 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 mild anaemia, 12.4% moderate and 4.5% severe. The proportion of 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% of the women had severe anaemia. among the mild anaemia group, 15.7% had a period of gestation <37 weeks and 84.3% had a period of gestation ≥37 weeks. 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 Normocytic Normochromic and 7.62% were with Dimorphic anaemia. 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. 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. 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 kg born 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.

Conclusion

The prevalence of anemia was 28.28%. 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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