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Prevalence of Anaemia in Pregnancy, Risk Factors, and Adverse Perinatal Outcomes in respect of Muzaffarpur District of Bihar

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Abstract

Background and Objective.

Anaemia in pregnancy is a public health problem in developing countries like India. This is a major problem in backward/underdeveloped states of India i.e Bihar. This study aimed to determine the prevalence, risk factors, and adverse perinatal outcomes of anaemia among pregnant women in Aurai Block of Muzaffarpur District, Bihar..

Methods.

This was a follow-up study conducted from October 2015 to June 2017. A total of 270 pregnant women were enrolled in this study. Interviews were conducted followed by determination of haemoglobin level. Women were followed up at delivery and at 14 days and 28 days after delivery.

Results.

A total of 270 women were included in this analysis. The prevalence of anaemia was 18.0% and 2% had severe anaemia. The clinic of recruitment and low education level of the women were the factors that were independently associated with anaemia during pregnancy. At delivery, there were 10 stillbirths, 26 low birth weight (LBW) newborns, and 3 preterm birth cases. No association was found between anaemia and LBW, preterm birth, or stillbirths.

Conclusion.

Anaemia in pregnancy was a mild public health problem in the study setting of Aurai Block of Muzaffarpur District of Bihar.

1. Introduction

Anaemia during pregnancy is a public health problem especially in developing countries like India and is associated with adverse outcomes in pregnancy. World Health Organization (WHO) has defined anaemia in pregnancy as the haemoglobin (Hb) concentration of less than 11 g/dl. According to WHO, anaemia is considered to be of a public health significance or problem if population studies find the anaemia prevalence of 5.0% or higher. Prevalence of anaemia of ≥40% in a population is classified as a severe public health problem.

Global data shows that 56% of pregnant women in low and middle income countries (LMIC) have anaemia. 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%.

Anemia is the second most common cause of maternal death in India and contributing to about 80% of the maternal deaths caused by anemia in South East Asia. Anemia is also an established risk factor for intrauterine growth retardation, leading on to poor neonatal health and perinatal death.

The prospective observational study is undertaken to estimate the prevalence and to study maternal and early neonatal morbidity and mortality associated with anemia in a pregnant woman.

Other studies conducted in Bihar have reported a higher prevalence of anaemia among pregnant women: 38% in Bihar.

The causes of anaemia during pregnancy in developing countries are multifactorial; these include micronutrient deficiencies of iron, folate, and vitamins A and B12 and anaemia due to parasitic infections such as malaria and hookworm or chronic infections like TB and HIV. Contributions of each of the factors that cause anaemia during pregnancy vary due to geographical location, dietary practice, and season. But in Aurai Sub-District of Muzaffarpur inadequate intake of diets rich in iron is reported as the leading cause of anaemia among pregnant women.

Anaemia during pregnancy is reported to have negative maternal and child health effect and increase the risk of maternal and perinatal mortality. The negative health effects for the mother include fatigue, poor work capacity, impaired immune function, increased risk of cardiac diseases, and mortality. Some studies have shown that anaemia during pregnancy contributes to 23% of indirect causes of maternal deaths in developing countries.

Anaemia in pregnancy is associated with increased risk of preterm birth and low birth weight babies. Preterm and LBW are still the leading causes of neonatal deaths in developing countries like India contributing to 25% of the deaths. It has also been associated with increased risk of

intrauterine deaths (IUFD), low APGAR score at 5 minutes, and intrauterine growth restriction (IUGR) which is a risk for stunting among children of less than two years.

India as a country has strengthened different interventions to reduce the burden of anaemia during pregnancy. The interventions during pregnancy include anaemia screening during pregnancy and treatment, giving a combination of folic acid (FeFo) and iron supplements for three months, deworming, intermittent prophylaxis treatment for malaria (IPTp) with sulfadoxine pyrimethamine (SP) from 14 weeks, free provision of mosquito treated nets, and health education during the antenatal visits There is a need of having current information on burden and effects of anaemia during pregnancy after these multiple interventions. Therefore, this study aims to determine prevalence, risk factors, and associated perinatal adverse perinatal outcomes of anaemia during pregnancy in Aurai Sub-District in Muzaffarpur district of Bihar.

2. Methods

2.1. Study Design and Study Setting

The study was part of larger cohort study that aimed to describe the effects of anaemia on pregnancy outcomes and child growth in Aurai Sub-District in Muzaffarpur district of Bihar. The study was conducted between October 2015 and June 2017 in health care centre, that is, Aurai Primary health centres. This was the largest primary health centre in Aurai Sub-District in Muzaffarpur district of Bihar.

The larger study enrolled women in their third trimester of pregnancy and followed them at birth, at 14 days and 28 days postdelivery, and monthly up to 9 months and every postdelivery. Enrolment of pregnant women was conducted in October 2015 to April 2017 and follow-up of mothers and their infants up to 9 months was completed in June 2017. This paper used data that was collected from enrolment up to seven days postdelivery.

Aurai Sub-District in Muzaffarpur district of Bihar has a population of 290545. Out of which 153987 are male and 136558 are female as per the census of 2011. The total deliveries in Aurai Sub-District in Muzaffarpur district of Bihar in 2016-17 was 4048. There are 8 hospitals, 1 Primary health centre, and 32 dispensaries wherein 23 health facilities provide reproductive and child health services. The study was conducted at 1 government health centres in Aurai.

2.2. Study Population and Procedures

The study population included all pregnant women who were in their third trimester and attending for routine care at the two primary health care clinics between October 2015 and April

2017. The study excluded women who reported they will relocate/move after delivery and those who did not consent.

Women were informed about the study aims and follow-up schedule and those agreeing to participate gave a signed consent. Face-to-face interviews using questionnaire were conducted. The interviews were conducted in local language. The information collected included social demographic characteristics, economic characteristics, reproductive health history, feeding practices, and intended place of delivery. After the interviews, clinical examinations records were collected with diagnosis of HIV, and haemoglobin levels.

A total of 301 pregnant women were enrolled, but analysis was done on 270 women who had complete information of haemoglobin levels.

2.3. Data Categorization, and Analysis

Categorization of Variables. A pregnant woman was considered anaemic if haemoglobin was <11 g/dl [2]. Severity of anaemia was measured as follows: mild if Hb was 9.0–10.9 g/dl; moderate if Hb was 7.0–8.9 g/dl; and severe if Hb was <7.0 g/dl [2]. Age of participants which was collected as numerical variable was categorized (14–24, 25–34, and 35–49), as well as income per month (<60,000 Tsh, 60,000–200,000 Tsh, and >200,001 Tsh), partners age (15–24, 25–34, and 35+), being gravida (first, second, third, or more pregnancies), parity (1, 2, 3, 4, and 5+), frequency of antenatal care visits (1, 2-3, and 4+), pregnancy interval (≤24 months and >24 months), gestation age at delivery (<37 and ≥37), and number of meals per day (1, 2, or 3 or more meals per day). Preterm delivery was categorized as <37 weeks of gestation age, low birth weight was categorized as < 2500 grams, and early neonatal death is the death during the first 7 days of life [22].

3. Results

3.1. Demographic and Reproductive Health Characteristics of the Women

The age of the 270 participants ranged from 19 to 36 years. All of the participants were married and unemployed, and 155 (57.4%) had an income per month less than 5000 INR.

For majority of the 270 women (87.7%) this was their second or third antenatal visit, and 68% reported they have received iron supplementation during current pregnancy, Most of the women (81%) reported an interpregnancy interval of ≥24 months.

3.2. Prevalence of Anaemia among Pregnant Women

The prevalence of anaemia was 28.0%. Forty women had mild, 43 moderate, and 12 severe anaemia.

3.3. Factors Associated with Anaemia in Pregnancy

Women with secondary education or higher had 76% less odds of having anaemia compared to others. Other factors like age, marital status, occupation, income, and alcohol intake were assessed but were not associated with anaemia during pregnancy.

Women who attended ANC 4 or more times had lower prevalence of anaemia (17.4%) than those who attended only once (35.3%); women who reported having received iron supplementation in current pregnancy had lower prevalence (20.2%) than those who have not received any supplementation (29.5%), but the difference was not statistically significant. Other factors that were analysed but were not associated with anaemia during pregnancy include history of miscarriage, HIV status, and gestational age.

Food security or household characteristics (water source for sanitation, owning toilet facility, household ownership, land ownership, history of food insecurity, number of meals taken per day, and intake of meat or fish) were assessed but none was associated with anaemia in pregnancy.

Education remained significantly associated with anaemia in pregnancy. Women with primary and secondary education or more had 72% and 79% significantly less odds of having anaemia compared to women with no formal education.

3.4. Birth Outcomes among Women in Aurai Sub-District in Muzaffarpur district of Bihar

Among 270 pregnant women who had complete information on Hb, had delivery information.. There were no difference in anaemic status between those women who had information at delivery and those who did not have information at delivery.

At delivery, there were 10 stillbirths, 26 low birth weight newborns, and 3 preterm birth cases. Two out of 270 infants died within the first 7 days.

No association was found between anaemia and low birth weight, preterm birth, or stillbirths in Aurai Sub-District in Muzaffarpur district of Bihar.

4. Discussion

The study findings showed that prevalence of anaemia during pregnancy from the selected health centres in Aurai Sub-District in Muzaffarpur district of Bihar was 28.0%. The nutritional and

secondary or higher education among women were factors that were associated with anaemia in pregnancy. Anaemia in pregnancy was not associated with adverse pregnancy outcomes in this setting.

The prevalence of anaemia in the Aurai Sub-District in Muzaffarpur district of Bihar has improved. This may imply an improvement in maternal nutrition in this setting as well as general health and care during pregnancy. Over the years, the government has strengthened the antenatal care (ANC) services and every pregnant woman is given iron supplementation to combat anaemia, deworming, and malaria prophylaxis. Nowadays pregnant women have to take malaria prophylaxis and deworms in front of the health care provider. This increases the uptake of medication and hence prevents anaemia. The prevalence of anaemia during pregnancy has been reported by other researchers to range from 32% to 62.2%.

Women who had secondary or higher education were less likely to be anaemic compared to their counterparts. Education has been reported to reduce the risk of being anaemic in several studies. Educated pregnant women have better income and eat nutritious food and hence do not get nutritional anaemia. A study in other countries also reported higher prevalence of anaemia among pregnant women who had no education. Secondary and higher education had been associated with several other good maternal and child outcomes like higher frequency of exclusive breastfeeding, attending for antenatal care visits for 4 or more recommended visits, utilization of skilled attendance during delivery, and health care seeking when the children have pneumonia or malaria. Women education and empowerment are not within health sector and there is a need for multisectoral collaboration in combating anaemia and other maternal health problems.

Strength and Weakness of the Study. Diagnosis of anaemia was based on laboratory analysis and did not depend on clinical assessment as reported by other researchers. Information on birth outcomes for women who were lost to follow-up from enrolment to delivery might have affected the prevalence of birth outcomes. It may be that those who were lost to follow-up experienced negative pregnancy outcomes and did not see the importance of returning for follow-up, hence underestimating occurrence of pregnancy outcomes. The other causes of negative birth outcomes like diabetes and preeclampsia were not assessed.

5. Conclusion

Anaemia in pregnancy was a mild public health problem in Aurai Sub-District in Muzaffarpur district of Bihar. The main risk factors were found to be the place of residence and education level of the pregnant woman. Ongoing interventions to target anaemia during pregnancy seem to be working in this setting and they should reach universal coverage. Further, I recommend

ongoing education about effects of anaemia especially among women with low education and population of adolescent women and women of reproductive age in general.

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