

Prevalence Of Anaemia Among Pregnant Women At Antenatal Care Booking In Ilorin, North Central Nigeria

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Abstract

Anaemia is a global health problem which commonly affects women and children most especially in the developing countries. Anaemia in pregnancy is the most common haematological condition encountered among pregnant women in most developing countries including Nigeria. This prospective study was carried out to determine the red blood cell indices (PCV, Hb, RBC, MCH, MCV, MCHC) and the prevalence of anaemia among pregnant women attending the University of Ilorin Teaching Hospital, Ilorin.

A total of 298 women who presented for booking at the antenatal clinic at different trimesters of pregnancy were enrolled in the study. There were 64 (21.5%) women in first trimester, 146 (49.0%) women in second trimester and 88 (29.5%) in third trimester. The mean age of the women was 25.8 ± 3.2 years, and their ages ranged between 18-42 years. One hundred and eighty pregnant women had haemoglobin concentration < 11.0 g/dl giving a prevalence rate of anaemia of 60.4%. Mild anaemia was found in 105 (58.3%), moderate anaemia in 72 (40.0%) and severe anaemia in 3 (1.7%) of the pregnant women. There was significant correlation between anaemia and gestational age, parity and level of education at booking. This study indicated presence of high prevalence of anaemia in pregnancy and there is need for appropriate interventional strategies to be put in place so as to reduce prevalence of anaemia and improve pregnancy outcome in our environment.

Keywords: Prevalence, Anaemia, Pregnancy, Booking, Antenatal

Introduction

Anaemia is the reduction in the haemoglobin concentration of blood below the normal reference values for the age, sex, race and place of residence of an individual¹. remains a major global health issue more

especially in women and children^{2,3}. The low haemoglobin concentration is accompanied by a decrease in the total number of red blood cells as well as other red blood cell indices such as packed cell volume, mean haemoglobin concentration, mean corpuscular volume and mean corpuscular haemoglobin concentration. Consequently, there is impaired ability of the blood to transport adequate amount of oxygen to the various organs and tissues in the body thereby leading to grievous consequences^{4,5}.

During pregnancy, there is increased demand for iron and other vitamins by the mother and the growing foetus and as a result pregnant women often become anaemic due to inability to meet the required levels of these substances either due to inadequate dietary intake or infections such as malaria⁶. Also, the increased plasma volume and the haemodilution which is observed in pregnancy may contribute to the anaemia of pregnancy⁷.

Anaemia in pregnancy constitutes a major health problem worldwide, and the magnitude of this was reflected by the estimation of World Health Organization (WHO) that more than half of the women in the world have haemoglobin values that are indicative of anaemia i.e. haemoglobin concentration < 11.0 g/dl, and more than 70% of these women are found in the developing and low income countries including Nigeria^{2,7}. Pregnancy therefore places an additional burden on the already compromised haemoglobin concentration which may result in severe anaemia if supplementation with oral iron is not given early in pregnancy.

Reduction in haemoglobin concentration during pregnancy has been reported to have significant impact on the health status of both the mother and her growing foetus. Anaemia in pregnancy has been associated with adverse pregnancy outcomes such as prematurity, low birth weight, intrauterine growth retardation, intrauterine foetal death, increased maternal morbidity and mortality among others^{8,9}. Recent studies within and outside Nigeria have estimated the prevalence of anaemia in pregnancy in developing countries to vary from 33% -75% of which about 7% may be severely anaemic^{7, 10,11,12,13,14}. The WHO has categorized anaemia in pregnancy as mild (haemoglobin concentration is 10.0 – 10.9 g/dl), moderate (haemoglobin concentration 7.0 – 9.9 g/dl) and severe (haemoglobin concentration < 7.0 g/dl)^{2,7}. Primigravidae living in areas of malaria endemicity

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Table 1: showing the socio-demographic characteristics of the pregnant women at booking and association with anaemia in the study population

| Variables | N= 298 Frequency (%) | Anaemia Present Frequency (%) | Anaemia Absent Frequency (%) | P value |
|--------------------------|-------------------------|----------------------------------|---------------------------------|---------|
| Age (years) | | | | 0.025 |
| 18-22 | 23 | 12(52.2) | 11(47.8) | |
| 23-27 | 44 | 30(68.2) | 14(31.8) | |
| 28-32 | 144 | 90(62.5) | 54(37.5) | |
| 33-37 | 70 | 36(51.4) | 34(48.6) | |
| 38-42 | 17 | 12(70.6) | 5(29.4) | |
| Parity | | | | 0.046 |
| Nulliparous | 60 | 30(50.0) | 30(50.0) | |
| Para 1 | 196 | 128(65.3) | 68(34.7) | |
| Para 2 | 32 | 14(43.7) | 18(56.3) | |
| =Para 3 | 10 | 8(80.0) | 2(20.0) | |
| Educational Level | | | | 0.023 |
| None | 19 | 9(47.4) | 10(52.6) | |
| Primary | 42 | 24(57.1) | 18(42.9) | |
| Secondary | 115 | 55(47.8) | 50(52.2) | |
| Tertiary | 122 | 92(75.4) | 30(24.6) | |
| Occupation | | | | 0.035 |
| Civil Servant | 148 | 86(58.1) | 62(41.9) | |
| Housewife | 56 | 36(64.3) | 20(35.7) | |
| Self Employed | 40 | 23(57.5) | 17(42.5) | |
| Petty Trading | 54 | 35(64.8) | 19(35.2) | |
| Marital Status | | | | 0.038 |
| Single | 48 | 22(45.8) | 26(54.2) | |
| Married | 250 | 158(63.2) | 92(36.8) | |
| Gestational Age | | | | 0.040 |
| First Trimester | 64 | 42(65.6) | 22(34.4) | |
| Second Trimester | 146 | 86(58.9) | 60(41.1) | |
| Third Trimester | 88 | 52(59.1) | 36(40.9) | |

mean age of the women was 25.8 ± 3.2 years, and their ages ranged between 18-42 years. There were 64 (21.5%) women in their first trimester of pregnancy, 146 (49.0%) women were in the second trimester and 88 (29.5%) women were in the third trimester. The socio-demographic characteristics of the pregnant women in relation to the presence or absence of anaemia at booking are presented in Table 1.

One hundred and eighty pregnant women (60.4%) of the study population were anaemic with haemoglobin concentration lower than 11.0g/dl at booking. One hundred and five (58.3%) of the anaemic pregnant women had mild anaemia (Hb conc. 10.0-10.9g/dl), 72(40.0%) women had moderate anaemia (Hb conc. 7.0-9.9g/dl) and severe anaemia (Hb conc. <7.0g/dl) was found in 3 (1.7%) of the anaemic pregnant women (Table 2). The highest proportion of anaemia was found in pregnant women in the age group 23-27 years (68.2%) while the lowest cases of anaemia was found in the 33-37 years age group (51.4%). The

correlation between the age of the pregnant women and presence of anaemia was statistically significant ($p = 0.025$) Table 1.

The mean values of the haematological indices were: PCV ($29.98 \pm 2.52\%$), \bar{c} (9.83 ± 0.82 g/dl), RBC ($3.52 \pm 0.38 \times 10^9/L$), MCH (28.11 ± 2.41 pg), MCV (85.69 ± 6.66 fl) and MCHC (32.80 ± 1.04 g/dl) PCV, \bar{c} and RBC were found to be significantly reduced in the anaemic pregnant women when compared with their non anaemic counterparts ($p=0.002$, 0.022 , 0.037 respectively) but no significant difference was observed in the mean values of MCH, MCV and MCHC (Tables 3 and 4). Forty two (65.6%) of the pregnant women that presented for booking in the first trimester were found to be anaemic, 86(58.9%) of women in second trimester were anaemic while 52(59.1%) in the third trimester were anaemic (Table 5).

Significant association was found between the gestational age of the women at booking and the

Table 2: showing the distribution of anaemic pregnant women according to the degree of anaemia

| Classification of Anaemia | Mean HbConcentration | SD | Frequency | Percentage |
|---------------------------|----------------------|------|-----------|------------|
| Mild | 10.44 | 0.28 | 105 | 58.3 |
| Moderate | 9.09 | 0.60 | 72 | 40.0 |
| Severe | 6.32 | 0.52 | 3 | 1.7 |
| Total | | | 180 | 100.0 |

Table 3: showing the mean values of the haematological parameters in the pregnant women compared with normal reference values

| Parameter | Anaemia Present Mean SD | Anaemia Absent Mean SD | Reference Values |
|--------------------------|----------------------------|---------------------------|------------------|
| PCV % | 29.98 2.52 | 35.53 1.84 | 38.0 – 48.0 |
| Haemoglobin g/dl | 9.83 0.82 | 12.80 0.72 | 11.5 – 16.5 |
| RBC x10 ¹² /L | 3.52 0.38 | 4.23 0.32 | 3.8 – 5.8 |
| MCH pg | 28.11 2.41 | 28.14 1.70 | 27.0 – 32.0 |
| MCV fl | 85.69 6.66 | 84.47 5.08 | 76.0 – 96.0 |
| MCHC g/dl | 32.80 1.04 | 33.21 1.04 | 32.0 – 36.0 |

Table 4: showing the mean values of haematological parameters in the anaemic and non-anaemic pregnant women

| Parameter | Anaemia Present Mean SD | Anaemia Absent Mean SD | P- value |
|--------------------------|----------------------------|---------------------------|----------|
| PCV % | 29.98 2.52 | 35.53 1.84 | 0.002 |
| Haemoglobin g/dl | 9.83 0.82 | 12.80 0.72 | 0.022 |
| RBC x10 ¹² /L | 3.52 0.38 | 4.23 0.32 | 0.037 |
| MCH pg | 28.11 2.41 | 28.14 1.70 | 0.618 |
| MCV fl | 85.69 6.66 | 84.47 5.08 | 0.073 |
| MCHC g/dl | 32.80 1.04 | 33.21 1.04 | 0.125 |

Table 5: showing the distribution of pregnant women according to their gestational age at booking

| Gestational Age | Anaemia Present (%) | Anaemia Absent (%) | Total number (%) |
|------------------|------------------------|-----------------------|---------------------|
| First Trimester | 42(65.62) | 22(34.38) | 64(100) |
| Second Trimester | 86(58.9) | 60(41.1) | 146(100) |
| Third Trimester | 52(59.09) | 36(40.91) | 88(100) |
| Total | 180(60.4) | 118(39.6) | 298(100) |

occurrence of anaemia in the different trimesters ($p = 0.025$). Also, statistically significant relationship was found between anaemia and the marital status, occupation, educational level and parity of the subjects at booking (Table 1).

Discussion

Anaemia in pregnancy constitutes a global health problem and more especially in the developing countries where the incidence has been reported to be very high and may be associated with increased maternal and perinatal morbidity and mortality^{8, 9}. Previous studies from Nigeria^{7,11,12,15,16,17,18}, Ethiopia^{13,25}, Ghana²⁶ and India¹⁴ on the prevalence of anaemia in pregnancy have reported prevalence rates from 33% to 75%. The prevalence of anaemia in our study was 60.4%, and this result was found to fall within the prevalence rates that have been reported by other researchers within and outside Nigeria^{13, 14, 16,17,19,21,,26}.

However, the prevalence of anaemia in this study was lower than 40.8% reported from Enugu, Nigeria¹⁵, 20.7% in Benin City, Nigeria²⁷, and 27.6% in Lagos, Nigeria¹². The lower percentage of anaemia which was recorded in a study was attributed to early attendance recorded at the booking clinic in majority of the pregnant women enrolled during the study period¹². In the present study, majority of the pregnant women were enrolled for antenatal care in the second and third trimesters which could have been responsible for the high prevalence of anaemia recorded in our study, since early booking would have identified the anaemic pregnant women early enough for better monitoring and correction of anaemia by appropriate oral supplementation with haematinics²⁸.

Anaemia was found to be more prevalent in the second and third trimesters in our study. This finding is in agreement with previous findings^{5,7,12,15}. It is generally recommended that booking for antenatal

clinic should take place within the first 12 weeks of pregnancy for early detection and treatment of pregnancy related problems²⁹. The increased anaemia observed in women during the second and third trimesters may have been as a result of late booking for antenatal care by the women in our study. The anaemia may also have been aggravated by the physiological haemodilution of pregnancy which has been reported to be more pronounced in the last two trimesters of pregnancy⁷. Majority of the anaemic pregnant women in this study were found to have mild to moderate anaemia (58.3% and 40.0% respectively) while severe anaemia was recorded in only 3(1.7%) pregnant women. While some previous studies have reported no case of severe anaemia^{15,29} or very low prevalence rates from 0.3% to 0.8%^{7,14}, studies in Gombe, Nigeria¹⁸ and in Ethiopia¹³ reported severe anaemia of 2.1% and 3.1% respectively in their studies.

The mean packed cell volume (PCV) of the anaemic pregnant women in this study was 29.98% which by the WHO definition is indicative of anaemia^{2,6}. Although, it had been reported that a large number of pregnant women in Nigeria with PCV of 30% to 33% go through pregnancy without any apparent compromise to the pregnant mothers and their babies¹⁶, low PCV levels below 30% definitely qualifies for further investigation and treatment of affected women so as to prevent the adverse consequences of maternal anaemia in both the mothers and their unborn babies. Early booking for antenatal care, assessment of haematological parameters and enlightenment programmes during antenatal clinic visits may help to reduce the effects of anaemia on pregnancy outcomes.

It is generally believed that parity is a risk factor for anaemia in pregnancy. Anaemia tends to increase with increasing parity because repeated pregnancies could lead to depletion of iron stores especially when there is no iron supplementation during pregnancy^{17,21}. In our study, majority of anaemia cases encountered were in the multiparous women (80%). This finding is in agreement with previous studies which had reported increased anaemia in the multigravidae pregnant women^{7,19,21}. The age of the women at booking was also found to be significantly associated with the incidence of anaemia in our study, with majority of the anaemia cases being found in the 23 – 27 and 38 - 42 years age groups. This finding is in agreement with the finding of Olatubosun et al in Uyo, Nigeria, which also found increased percentage of anaemia in the 20 – 24 and 35-39 years age groups⁷. Marital status, level of educational and occupation of the women at booking were also found to have significant correlation with anaemia in our study. This finding is in agreement with reports of Olatunbosun et al⁷, Bukar et al¹⁸, and Lamina and Sorunmu³⁰ which reported high prevalence of anaemia among

unemployed pregnant women and those with none or only primary school education. In our study we found high prevalence of anaemia among the petty traders and housewives which supported previous studies where anaemia was found to be prevalent in low income and less educated women. The high cases of anaemia observed in the married women and those with tertiary education in our study could be rather apparent than real as majority of the women that booked for antenatal care were in the married and tertiary education categories which could have resulted in the higher percentage of anaemia observed in them.

Conclusion

The prevalence of anaemia in pregnancy in this study is high, hence the need for intensified education and advocacy in women, pregnant and non pregnant, on the need for early booking for antenatal care in our environment. Early assessment and diagnosis of anaemia in the pregnant woman during booking at Antenatal Clinics especially during the first trimester could lead to prompt intervention and commencement of oral supplementation with iron and other routine drugs such as folic acid and malaria prophylaxis as well as screening for other conditions like human immunodeficiency virus (HIV), hookworm infestation, sickle cell disease etc which could contribute to anaemia of pregnancy. This will ultimately lead to a reduction in the prevalence of anaemia in pregnancy in our environment thereby improving pregnancy outcome. The findings in this study may also form the basis of a larger study in the future.

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