

Original Research

Prevalence of Anaemia among Pregnant Women Attending 82 Division Nigerian Army Hospitals, Enugu

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ABSTRACT

Introduction

Anaemia is the most common hematologic abnormality diagnosed in pregnancy. It continues to be a major health problem in many developing countries and is associated with increased rates of maternal and perinatal morbidity and mortality.

Material and Methods

This is a retrospective study of 400 pregnant women who attended antenatal care at the 82 division Nigerian army hospital, Enugu State, Nigeria. Their antenatal case records were retrieved from the records department and the antenatal records unit of the hospital. All the relevant information were retrieved and analyzed.

Result

Using the World Health Organization (WHO) criterion of packed red cells (PCV) < 33% to define Anaemia in pregnancy, a number of our pregnant women at booking, 184 (46%) were anemic at booking with 152 (38%) being mildly anemic, 24 (4%) moderately anemic, while 8 (2%) pregnant woman presented severe Anaemia.

Conclusion

Anaemia in pregnancy has an unacceptably high prevalence in our pregnant population at booking, and all efforts must be made to correct this widespread problem as early as possible using the most appropriate and expeditious means to avoid preventable calamities.

Keywords

Anaemia; Pregnancy; Antenatal; Mortality.

INTRODUCTION

The World Health Organization (WHO)¹ defined Anaemia as a haematologic condition and a sign of an underlying disorder characterized by a reduction in the number of red blood cells, or a reduction in the concentration of haemoglobin in the blood stream to a level below 10.5 g/dL. Anaemia has also been defined as a reduction below normal in the number of red corpuscles per cubic millimeter, the quantity of haemoglobin and the volume of packed red cells per 100 ml of blood as a result of impaired erythrocyte production or increased erythrocyte loss which leads to impaired tissue perfusion.² The causes of anaemia according to WHO includes the following; pregnancy and child birth, repeated infections (malaria, hookworm), poor feeding due

to socioeconomic factors (poverty and low educational status) and haematologic conditions such as impaired erythrocyte production or increased erythrocyte loss.³ Malaria in pregnancy is one of the predominant causes of anaemia in pregnancy.⁴ Malaria accounted for more than 56% anaemic cases in pregnancy in Nigeria.⁵ Forty per cent of all maternal peri-natal deaths are linked to anaemia. Favourable pregnancy outcomes occur (30%-45%) less often in anaemic mothers and their infants have less than one and a half of normal iron reserves.⁶ Anaemia is a common problem worldwide and poses a great challenge to both health workers and governments due to its attendant consequences on health and socioeconomic indices. These indices reflect the quality of life of citizens of a nation.⁷ Anaemia in pregnancy poses a great danger to both mother and child.⁸ WHO⁹ report estimates that 35% to 80% of

pregnant women in developing countries are anaemic: notably, in Nigeria (60% pregnant women are anaemic), Tanzania (86% pregnant women have iron deficiency anaemia and 1/3 of the anaemic women had malaria), Coastal Kenya (75.6% are anaemic while 9.8% are severely anaemic). Also a WHO study in Guinea during 2000-2006 revealed that 58% of pregnant women who died during child birth were anaemic while a small percentage (18%) of the pregnant women from industrialized countries is anaemic.

In Nigeria, studies carried out by various groups have shown varying results. For instance, a study done by Esike et al¹⁰ at the University Teaching Hospital Abakaliki, Ebonyi State, revealed that anaemia in pregnancy has a prevalence rate of 56% out of a population of 3,400 women who attended antenatal clinic at the hospital that year. The study also revealed that out of the 1,904 (56%) cases of severe anaemia having haemoglobin level less than 10.5 g/dL, 1,850 women responded to treatment with oral and parenteral haematinics while the remaining 54 women required blood transfusion. Unfortunately 2 women developed complications (pre-mature labour and still birth at 2nd and 1st trimester of pregnancy respectively).

MATERIALS AND METHODS

Study Area

This cross-sectional study was carried out in the antenatal clinic of at 82 division Nigerian army hospital, Enugu This is one of military health facility in Enugu State and is situated in the South-East geopolitical zone of Nigeria. Enugu, the capital city, is located in the tropical rain forest belt of Nigeria with an annual temperature of 26.3 °C and average rainfall of 1730 mm annual rainfall of 2430.0 mm. However, there is a dry season from November to April when monthly rainfall is low. The military hospital serves both the military personnel within the barracks and civilian populace and is strategically located within the city center. The hospital can be easily accessed from every part of the city.

Estimation of Sample Size

Average prevalence of anaemia in pregnancy in developing countries including Nigeria is put at 60.0%.^{11,12} The estimate from this study was desired to be within five percent of the actual prevalence with 95 percent confidence level. The sample size was calculated using the Kish Leslie formula for cross-sectional studies.¹³

$$n = \frac{Z^2 Pq}{d^2}$$

Where n is the desired sample size and Z is the standard normal deviate usually set at 1.96, which corresponds to the 95% confidence interval. P is the proportion of pregnant women with anaemia, which is 60.0%. q is complementary proportion equivalent to one minus; that is, 1-0.6 equal to 0.4. d is the degree of accuracy desired (absolute precision), which is 5.0% (0.05).

Thus;

$$n = \frac{(1.96 \times 1.96 \times 0.6(1-0.6))}{0.05^2} \rightarrow \frac{0.92194}{0.0025} \rightarrow 369$$

Hence about 369 subjects were needed for the study. Since follow-up was not needed in the study, attrition rate was not necessary. However, there was a deliberate increase in sampling size to 400.

Inclusion Criteria

Every pregnant woman attending the weekly antenatal clinic of the hospital is recruited into the study.

Exclusion Criteria

Those excluded were pregnant women at their follow-up antenatal visit and those who had received blood transfusions in the index pregnancy or were already receiving treatment for anaemia in pregnancy before their booking visit.

Data Collection

Data were collected over a period of study (September 2016 to May 2017); during that time 400 pregnant women were recruited at their first antenatal visit. The women were interviewed with copies of a structured questionnaire. The following information was recorded: maternal age, parity, gestational age, last child birth, last menstrual period, level of education and occupation of the women and their husband, history of fever in the index pregnancy, presence of any chronic illnesses, and history of vaginal bleeding in present pregnancy.

Packed cell volume (PCV) was done for each woman at the time of recruitment. From each of the recruited woman, 5ml of venous blood was collected from the antecubital vein using plastic disposable syringes into sample bottles containing Ethylenediamine-tetraacetic acid (EDTA).

Packed Cell Volume Estimation

Two capillary tubes labeled for each subject were filled with blood to about 2/3 of the length of each tube and one end of each of these tubes was then sealed with plasticin. This was to ensure that the average of the two values obtained was used for calculation. Several labeled samples were assembled in the centrifuge (haematocrit machine) and spun at 5000 revolutions per minute for 5 minutes. When the machine rotated to a halt, the cover was opened, the capillary tubes removed, and the PCV was read from a Hawksley microhaematocrit reader.

RESULTS AND DISCUSSION

Anaemia and iron deficiency related to pregnancy remain a major health problem especially in Africa. The diagnosis of anaemia dur-

ing booking among pregnant women is essential as it affords one the opportunity to institute interventions to prevent the complication of anaemia especially considering the prevalent high maternal and perinatal morbidity and mortality associated with anaemia in pregnancy in the tropics.¹⁴ Data from the literature in developing countries have reported prevalence of anaemia in pregnancy that ranged from 35.0% to 75.0%.¹⁵

PCV range (%)	Frequency (n)	Percentage (%)
<19	8	2
19-26	152	38
27-33	24	6
≥34	216	54

PCV Ranges: Normal (PCV≥34%), Mild (PCV 33-27%), moderate (PCV 19-26%), and severe (PCV below 19%)¹⁴

Results from the present study showed that the mean age of the women was 28.46±4.81 with a range of 18 to 38 years with a standard error of 0.68. The mean PCV was 33.32±4.51 with a range of 15% to 41%. The severity of Anaemia was classified as follows: mild (PCV 33%-29%), moderate (PCV 19-26%), and severe (PCV below 19%).¹⁴ Results from the tables above shows that of the 400 samples analyzed, 184(46%) were anemic. The finding in our study correlates with the estimated global prevalence rate of Anaemia in pregnancy is in the range of 40%-60%.¹⁶ The prevalence of Anaemia in this study is slightly lower than the 56.0% quoted by WHO for prevalence of anaemia in Africa based on the 1988 data¹⁷ implying that even after 29 years; the situation has only marginally improved. The 46% prevalence of Anaemia reported in this study is slightly higher than the value of 40.4% reported by Dim and Onah¹⁸ working in the same city earlier a decade ago but higher than the 56% reported in 2016 by Esike et al¹⁰ working in nearby Abakaliki all in the same south east region of Nigeria. It is however slightly different from the rate of 35.3% reported by Anorlu et al¹³ working in the south west region, 51.8% reported by Bukar et al¹⁹ working in northern Nigerian, 43.5% reported by Bassi et al²⁰ working in the North Central and 31.8% by Olatunbosun et al²¹ working in the South Region of the country. However, this is not comparable to the cross sectional survey conducted in four Nigerian States (Jigawa, Katsina, Yobe, Zamfara) where the prevalence rate of anaemia was estimated to be 61.2%-88.7%.²² The significant difference in the prevalence rate may be attributed to relatively higher utilization of iron-folic acid supplementation amongst the women in this study. The high prevalence of anaemia in this study is probably related to the low socioeconomic status of the women, which may have impact on their nutritional status and health seeking behavior.^{12,13} When the WHO⁹ criterion for the diagnosis of Anaemia in pregnancy, i.e. hemoglobin <11.0 g/dL (PCV<33%) is applied, 46% of the women were anemic. A range of 35%-75% has been reported for developing countries.^{15,23} The definition of what constitutes Anaemia in pregnancy has been the subject of lively debate for several years. If this definition were to be applied in Nigeria, more than two thirds of women attending antenatal clinics in the country will require to be investigated for Anaemia.¹⁵ In practice, it has been found that a large number of

pregnant Nigerian women with hematocrit values between 30% and 33% get through pregnancy without any apparent ill effects to themselves or their offspring. Thus, in practice, only Anaemia with hematocrit lower than 30% is deemed worthy of further investigation and treatment in this environment (Table 1).¹⁵

While most cases of Anaemia were either mild or moderate, some women still presented with severe Anaemia. Expectedly, of the 184(46%) anemic pregnant women from the present study, 152/184(82.61%) of the anemic pregnant women presented mild Anaemia, which was similar with most reports within the country. The study also showed that 24/184(13.04%) of the anemic women had moderate, while 8/184(4.35%) anemic pregnant woman presented severe Anaemia. This report is a departure from results by Dim CC, et al¹⁸ working in the same city. In their study, they reported 0% rate of severe Anaemia while presenting 90.7% mild Anaemia and 9.8% moderate Anaemia, which was similar with reports by Esike COU, et al¹⁰ working in nearby Abakaliki in the same south east region of Nigeria. The 4.35% of severe Anaemia reported in the study also contradicts other recent studies from southeastern Nigeria^{24,25} and Ibadan, Western Nigeria,²⁶ where no case of severe Anaemia was noted, unlike in Shagamu, Western Nigeria,²⁷ where 0.7% of the anemic pregnant women were severely anemic. This was also higher than the lower than 2.1% by Bukar et al.¹² Reports from Bassi et al²⁰ working in Jos showed that 2% of pregnant women had severe anaemia, which are comparable with those from Bida, Niger state, Nigeria.²⁸⁻³⁰

However, it can be noted that the level of sever anemic pregnant women (4.35%) could be an isolated case as reports from the south east especially from the same Enugu showed no presence of severe Anaemia as reported here. Most severe Anaemia cases where reported mostly in Northern Nigeria.

Mild to moderate Anaemia, although generally well-tolerated, clearly adversely affects the sense of well-being, resulting in fatigue and a decrease in work capacity. Women in sub-Saharan Africa are the “hewers of wood and the drawers of water;” therefore the decreased work capacity as a result of the Anaemia will have economic consequences on the family in particular and on society at large.²⁰

There was a statistically significant association between increasing maternal age and prevalence of anaemia. Women within the age group 36-41 had the lowest mean PCV (31.00±7.00) (Tables 2,3). This finding is however at variance with some other studies that suggested the highest rate of anaemia in teenagers and adolescent.

Age (Years)	Frequency (n)	Mean PCV
18-23	88	33.63±3.17
24-29	128	32.1±5.13
30-35	160	34.00±3.92
36-41	24	31.00±7.00

Table 3. Results of Percentage Age Brackets of Anemic Pregnant Women

Age (Years)	Frequency (n)	% of anemic Pregnant
18-23	32	17.39%
24-29	72	39.13%
30-35	64	34.78%
36-41	16	8.70%

From the present study, it was shown that the number of anemic pregnant women reduced as the women grow older similar to the findings of Dim and Onah, Aimakhu and Olayemi, and Bukar et al.^{18,19,25} However, it is at odd with the finding of Hoque et al³¹ working in Greytown South Africa, and Idowu et al³² working in Abeokuta. It must however be noted that the influence of age is often closely intertwined with that of parity.¹²

RECOMMENDATIONS

During pregnancy, efforts should be geared towards the early detection and treatment of Anaemia before delivery. Also, medical staff managing pregnant women should endeavor to investigate anemic pregnant women further in order to identify the etiology whenever possible, despite commencing the usual treatment with iron and folate. All of these efforts would help to ensure safe motherhood.

CONCLUSION

The prevalence of Anaemia at booking is still high in Enugu. The results suggested that Anaemia predates the pregnancy in the majority of cases. Hence, preconception care, including iron and folic acid supplementation, is advocated to reduce this problem. During pregnancy, efforts should be geared towards the early detection and treatment of Anaemia before delivery. Also, medical staff managing pregnant women should endeavor to investigate anemic pregnant women further in order to identify the etiology whenever possible, despite commencing the usual treatment with iron and folate. All of these efforts would help to ensure safe motherhood.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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