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ANAEMIA IN PREGNANCY AND PREGNANCY OUTCOME IN OSOGBO, SOUTH WESTERN NIGERIA

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ABSTRACT

Anaemia in pregnancy is one of the leading complications of pregnancy and also one of the leading causes of maternal mortality and poor neonatal outcome especially in the developing countries. The study sought to determine the effect of anaemia on pregnancy and pregnancy outcome in Osogbo, South west Nigeria. It was a retrospective study, carried out on 250 women seen between January 2013 and December 2017 in Ladoke Akintola University of Technology Teaching Hospital (LTH), Osogbo. A structured proforma was used to extract data from the retrieved case notes. The causes of anaemia in pregnancy, foetal and overall pregnancy outcome were studied retrospectively. The outcome variables include APGAR score, perinatal mortality, birthweight and presence or absence of maternal complications (puerperal sepsis, postpartum haemorrhage, maternal death). Of the 250 pregnant women with anaemia studied, 15.1% of booked patients had severe anaemia and 45.2% had mild to moderate anaemia while 84% of unbooked patients had severe anaemia and 54.8% had mild to moderate anaemia. Malaria was the commonest cause of anaemia, accounting for 34.8%, followed by sepsis (13.6%) and nutritional causes (12.8%). Anaemia was noticed to be severe in women that did not receive Intermittent Preventive Therapy (42.7%) compared to women who had Intermittent Preventive Therapy (5.2%). Also babies of women with severe anaemia had a higher risk of birth asphyxia and perinatal mortality (10.8%). Women with haemoglobinopathy also had a higher prevalence of severe anaemia. Prevalence of anaemia was higher among the unbooked patients and those women in whom Intermittent Preventive Therapy were not administered, severe anaemia was also associated with poor perinatal outcome.

KEYWORDS: Anaemia, Pregnancy, Foeto-Maternal, Outcome.

INTRODUCTION

Anaemia in pregnancy according to the World Health Organization (WHO) is the Haemoglobin concentration level of less than 11g/dl at booking or Haemoglobin concentration of less than 10.5g/dl in the second trimester. In sub-Saharan Africa, where anaemia predates pregnancy most of the time, the cut off point for anaemia before which there is a risk of foeto-maternal complication is 10g/dl.[1]

A high proportion of women in both industrialized and developing countries become anaemic during pregnancy. WHO estimated that about 35% to 75% of pregnant women in developing countries and 18% in developed countries are anaemic.[2] However, many of these women were already anaemic pre-pregnancy, with the estimated prevalence of anaemia of 43% in non-pregnant women in developing countries and 12% in developed countries.[2]

In Nigeria, anaemia in pregnancy is a common problem in various antenatal clinics. About 63.3% of the pregnant women are anaemic. Local prevalence ranges from 35.3% in Lagos to 72% in Kano,[3,4] and which is similar to the incidence in some Asian countries such as 87% in India,[5] 77% in Bangladesh, 59% in Bhutan, 65% in Nepal and 60% in Sri Lanka.[5]

According to WHO, the estimates of the global burden of death that is attributable to anaemia in women of reproductive age group ranges from 16,800 – 28,000 annually with a greater risk of anaemia-related deaths in younger women.[6] In Nigeria, studies have shown that anaemia related maternal deaths range from 14.6% in the North Central Nigeria to 20% in the West region of the country.[7] Anaemia in pregnancy has increased foeto-maternal morbidity and mortality with complications ranging from mild to severe. Patients are susceptible to infections, anaemic heart failure, preterm labour and delivery with low birth weight babies and intrauterine foetal death. It is also a major cause of increased perinatal mortality.[8]

The cause of anaemia is multifactorial and varies greatly from one geopolitical zone to another.[2,9] The most common causes of anaemia in Nigeria include nutritional deficiencies of Iron and Folate, parasitic diseases such as malaria and hookworm, haemoglobinopathies (HbSS and HbSC) and recently, Human Immunodeficiency Virus (HIV) infection.[2,9,10] Iron deficiency anaemia is the commonest form of anaemia in pregnancy worldwide, accounting for about 85% of cases of anaemia.[2] Iron deficiency anaemia in pregnancy is usually caused by nutritional deficiency or low iron stores resulting from short pregnancy interval, previous heavy menstrual losses and additional foetal need.[1, 9] Malaria infection is a leading cause of anaemia in the tropics particularly in pregnant individuals. Malaria induced anaemia is more profound in pregnancy as the susceptibility to malaria is greater in the primigravidae. Anaemia resulting from malarial infection is caused by the destruction of infected and uninfected red blood cells as well as bone marrow suppression.[11]

Most of the causes of anaemia in pregnancy are preventable. However, despite the use of iron and folate supplementation, and anti-malaria prophylaxis which are prescribed to pregnant women in antenatal clinics for prevention of anaemia, the prevalence of anaemia is still high with attendant foeto-maternal complications.[11]

The study aims to determine the effect of anaemia on pregnancy and pregnancy outcome at Osogbo, Osun state, South Western Nigeria. Specific objectives were to describe the sociodemographic characteristics of patients with anaemia in pregnancy, determine the factors responsible for anaemia in pregnancy in LAUTECH Teaching Hospital, Osogbo, compare the severity of anaemia among booked and unbooked patients and compare the pregnancy outcome (Apgar score, perinatal mortality, birth weight, presence of maternal complications) in people with severe anaemia (PCV <21%) and mild to moderate anaemia (PCV >21% but <33%).

METHODOLOGY

This study was a retrospective study of anaemic pregnant women who had delivery at Ladoke Akintola University of Technology (LAUTECH) Teaching Hospital, Osogbo between 1st January, 2013 and 31st December, 2017. All anaemic pregnant women were eligible for the study except those with all forms of malignancy**,** immunosuppression and tuberculosis. The booked patients were studied for anaemia in the third trimester while anaemia was also studied in unbooked patients presenting late in the third trimester (registered patients) and during labour. Anaemia was defined based on haemoglobin concentration, and packed cell volume (PCV) of less than 21% was defined as severe anaemia while PCV between 21-32.9% was taken as mild to moderate anaemia.

Data were collected for maternal complications such as postpartum haemorrhage, postpartum anaemia, poor wound healing, puerperal sepsis and haemodynamic instability among others. A total of 322 cases were anaemic during the study period, however 250 cases met the eligibility criteria.

The study was reviewed and approved by the ethics and research committee of Ladoke Akintola University of Technology (LAUTECH) Teaching Hospital, Osogbo. Data were extracted from the retrieved case notes of the patients and analysed with the Statistical Package for Social Sciences (SPSS) version 18. Categorical data are expressed in frequencies and percentages, continuous data as means and standard deviation and proportions were compared using Chi square. Significance was set as $P < 0.05$.

RESULTS

The mean age was 28±6 years; most of the cases fell within 20- 29years (65.5%). Two hundred and twenty nine women were married (90.6%). Majority of the cases were Muslims (56%) and attained at least a secondary school education (table 1). Trading was the commonest occupation, 83(32.2%), among the cases reviewed while farming was the least, 3(1.2%). Majority of the patients were multipara and 175 (70%) booked index pregnancy above 37weeks.

Table 1: Socio-demographic distribution.
N = 250

VARIABLES	Frequency (n)	Percent (%)
Age		
19 and below	8	3.2
20 – 29	164	65.6
30 – 34	39	15.6
35 and above	39	15.6
Marital Status		
Married	229	91.6
Single	21	8.4
Religion		
Christianity	110	44.0
Islam	140	56.0
Educational Status		
No formal education	5	2.0
Primary	44	17.6
Secondary	100	40.0
Tertiary	101	40.4
Occupation		
Student	30	12.0
Artisan	56	22.4
Farming	3	1.2
Trading	83	33.2
Civil servant	55	22.0
Professional	23	9.2

Blood group O was the commonest blood group among the study population, accounting for 50% of the studied population and only 19(7.6%) patients were reactive to

HIV as at the time of screening(table 2). Only 36 patients (14.4%) had haemoglobinopathy, majority of which [26 (10.4%)] were HbSC. Malaria was the highest cause of anaemia among the pregnant women (34.8%), followed by sepsis (13.6%) [Table 3]. Other causes include nutritional factors (12.8%), APH (10.8%), UTI (9.2%), Immunosuppression (6.4%) and Helminthiasis (4.4%). Majority of the anaemic patients, 215 (86%), were transfused during the study period while only 35 (14%) were managed with haematinics (table 2).

Table 2: Booking parameters and PCV at 3rd Trimester.

VARIABLES	Frequency (n)	Percent (%)
Parity		
Para 0	45	37.2
Para 1 – 4	76	62.8
Booking GA		
Below 37 wks	75	30.0
Above 37wks	175	70.0
PCV at 3rd Trimester		
Less than 21 %	126	50.4
21% and above	124	49.6
Blood Group		
Group A	43	17.2
Group B	77	30.8
Group AB	5	2.0
Group O	125	50.0
RV Status		
Reactive	19	7.6
Non reactive	231	92.4
Genotype		
AA	146	58.4
AS	68	27.2
SS	6	2.4
SC	26	10.4
CC	4	1.6
Transfused in index pregnancy	215	86.0

Table 3: Causes of Anaemia

Causes	Frequency (n)	Percent (%)
Malaria	87	34.8
UTI	23	9.2
Nutritional	32	12.8
Immunosuppression	16	6.4
Helminthiasis	11	4.4
APH	27	10.8
Sepsis	34	13.6
Others	20	8.0
Total	250	100

Note: UTI = Urinary tract infection, APH= Antepartum haemorrhage

As regards the outcome of the pregnancy, a total of 40 babies died, and 144 women had peri-natal complications. The table 4 also showed that 153 out of 221 babies delivered had an Apgar score of 6 and below.

There was a highly significant association between a PCV of less than 21% in the mother and an APGAR score of ≤ 6 ($p<0.000$) as shown in table 5. Eighty five (81.7%) of the babies in mothers who had PCV of less than 21% were delivered with APGAR score of ≤ 6. Also out of all the patients with APGAR score of ≤ 6, 55.6% had a PCV of less than 21% in the 3rd trimester.

A very high percentage (84.9%) of patients with PCV less than 21% in 3rd trimester were unbooked and this association is highly significant ($p<0.000$). Also, 74.7% of the booked patient had a PCV of 21% and above in the 3rd trimester.

All (100%) of the patients with HbSS had a PCV of less than 21% in the3rd trimester as compared with 76.9%, 44.5% and 48.5% in the HbSC, HbAA and HbAS patients respectively. These difference in proportion of patients with a PCV of less than 21% among genotypes is highly significant ($p=0.004$).

Most patients with PCV of less than 21 %(84.9%) have never had IPT in the past whereas among patients that had IPT, 24.4% had a PCV of less than 21% in the 3rd trimester. The difference between the PCV in 3rd trimester and patients who had IPT is highly significant ($p<0.000$) as shown in table 6.

There is also a significant relationship between the PCV in the 3rd trimester and the outcome of the baby ($p = 0.018\%$). A larger proportion, 67.5% of babies died when the PCV of the mother is less than 21% at the 3rd trimester. Although a larger proportion (58.4%) of patients with PCV of less than 21% had a baby with birth weight less than 2.5kg, the relationship is not statistically significant ($p=0.124$).

Table 4: Pregnancy outcome

VARIABLES	Frequency (n)	Percent (%)
Birth weight		
Below 2.5kg	109	49.3
2.5kg and above	112	50.7
APGAR's score		
7 and above	68	30.8
6 and below	153	69.2
Fetal wellbeing		
Alive	210	84.0
Dead	40	16.0
Presence of maternal complication		
Present	144	57.6
Absent	106	42.4

Table 5: Relationship between anaemia at third trimester and baseline variables.
N = 250

Variables	PCV At 3rd Trimester [n (%)]		Pearson Chi-Square	p-value
	<21%	21% & above		
Booking Status				
Booked	19(7.6%)	56(22.4%)	26.930	0.000*
Unbooked	107(42.8%)	68(27.2%)		
Received IPT (2doses)				
Yes	19(7.6%)	59(23.6%)	30.755	0.000*
No	107(42.8%)	65(26.0%)		
Genotype				
AA	65(26.0%)	81(32.4%)	15.336	0.004*
AS	33(13.2%)	35(14.0%)		
SS	6(2.4%)	0(0%)		
SC	20(8.0%)	6(2.4%)		
CC	2(0.8%)	2(0.8%)		
Outcome of baby				
Alive	99(39.6%)	111(44.4%)	14.409	0.000*
Dead	27(10.8%)	13(5.2%)		
APGAR's Score				
7 and above	19(7.6%)	49(19.6%)	14.409	0.000*
6 and below	85(34.0%)	68(27.2%)		
Birth weight				
Below 2.5kg	57(54.8%)	52(44.4%)	2.366	0.124
2.5kg and above	47(18.8%)	65(26.0%)		
Teenage Pregnancy				
19 and below	3(1.2%)	5(2.0%)	0.550	0.458
20 and above	123(49.2%)	119(47.6%)		

IPT =Intermittent Preventive Therapy(Anti-malaria prophylaxis)

DISCUSSION

Anaemia in pregnancy still causes significant maternal morbidity and mortality in the developing countries including Nigeria. The burden and underlying factors varies even within countries.

The socio demographic characteristics also vary from one region to another. In this study, the sociodemographic characteristics were slightly different from previous studies. Majority of the pregnant women were within the ages of 20 and 29 whereas previous studies reported that anaemia in pregnancy is commoner among teenage pregnancies[12,13,14] It has been proven that malaria parasitaemia has a higher affinity for primigravida. This study did not also show high prevalence of anaemia among the teenagers unlike the work of Ogbeide et al.[15] However, it should be noted that the incidence of teenage pregnancy is very low in LAUTECH Teaching hospital which may be a reason while the incidence of anaemia in pregnancy is lower in this study.

In this study, majority of the pregnant women were married and had at least secondary level education which is also in disagreement with previous studies that revealed that anaemia in pregnancy is commoner among the unmarried, of low educational background, multiparity and non metropolitan residence.[13,14] Unemployment which is also one of the aetiologies of anaemia was not demonstrated in this study.

The prevalence of severe anaemia was high, 84.9% in unbooked patients and 15% of booked patients, compared to mild to moderate anaemia. This compares favourably with the work done by Rohilla[16] and Lamina et al.[17,18] Antenatal booking has been found to play a major role in reducing maternal and neonatal morbidity and mortality.[19] Majority of the cases of anaemia in pregnancy at LAUTECH Teaching hospital during the study period were unbooked. Most of the unbooked patients were moderately to severely anaemic. A very high percentage (84.9%) of patients with PCV less than 21% in 3rd trimester were unbooked and this association is highly significant (p<0.000), also 74.7% of the booked patient had a PCV of 21% and above in the 3rd trimester. The reduced occurrence of anaemia in the booked patients could be attributed to the routine investigations being done to determine the haemoglobin levels and the aetiology of anaemia. Administration of haematinics by the doctor is also another factor. This differs from the care given at home or at traditional birth homes which are mainly herbal preparations.

Malaria was seen as the major cause of anaemia (34.8%) and this was similar to the work of Nwonwu et al.[11, 20] but the prevalence of malaria parasitaemia in

primigravida was not demonstrated in this study. Other major causes of anaemia as revealed in this study include sepsis, nutritional deficiencies, antepartum haemorrhage and urinary tract infection. This is similar to findings in other less developed countries.[21, 22, 23, 24]

There is a significant relationship between the PCV in the 3rd trimester and the outcome of the baby (p = 0.018%). A larger percentage (67.5%) of babies died when the PCV of the mother is less than 21% in the 3rd trimester. Although a larger percentage (58.4%) of patients with PCV of less than 21% had a baby with birth weight less than 2.5kg, the relationship is not statistically significant (p=0.124). Incidence of birth asphyxia was more with severe anaemia as also demonstrated by earlier studies.[25, 26] The work of Muhammad et al.[27] and Bryant[28] which showed severe anaemia as a cause of intrauterine growth restriction was not demonstrated in this study.

Nutritional deficiency anaemia during pregnancy also continues to be a major health problem all over the world. To eradicate it certain steps can be taken at individual and community level like education of the women as regards anaemia, its causes and health implication. Imparting nutritional education, with special emphasis on strategies based on locally available food stuffs to improve the dietary intake of proteins and iron, administration of appropriate iron supplements and ensuring maximum compliance, deworming, treatment of chronic disease like malaria and universal antenatal care to pregnant women will help in combating this serious problem. Long term policies by government, non-government agencies and the community can be directed to formulate effective plans like eradicating anemia in pregnant women and adolescent girls.

It is recommended that pregnant women should be encouraged to attend Antenatal clinic and ensure administration of Intermittent Preventive Therapy.[11] It is also essential to routinely screen pregnant women for anaemia and anaemic pregnant women should be thoroughly investigated and appropriate treatment given. Weekly iron (60 mg) and folic acid (2.8 mg) should be given to all menstruating women including adolescents, periodically, in communities where Iron Deficiency Anaemia (IDA) is considered a problem. Also, appropriate dietary advice especially in vegetarians, and antihelmintic therapy if required, should be given to pregnant women, especially in communities where IDA is considered a problem. Daily oral iron (60 mg) and folic acid (400 mg) should be commenced as soon as possible together with behaviour changing communications when a woman becomes pregnant, and continued up to six months postpartum. The dose of iron could be reduced to 30 mg in women who have no Iron deficiency.

CONCLUSION

Anaemia in pregnancy is associated with adverse consequences both for the mother and the foetus. Studies have shown that the adverse consequences of maternal anaemia may affect not only the neonate and infant but also increase the risk of non communicable diseases when the child grows into an adult and the risk of low birth weight in the next generation. Technology for detection of anaemia and its effective treatment are available and affordable. And it is possible to effectively implement these even in primary health care settings and these are very cost effective interventions. Effective implementation of the strategies for combating anaemia can go a long way in reducing the short- and long- term adverse consequences of anaemia.

REFERENCES

1. UK Guidelines in the Management of Iron deficiency in Pregnancy. British Committee for Standard Haematology, July 2011.
2. World Health Organization. Worldwide prevalence of anaemia 1993-2005; WHO global database on anaemia. Edited by Bruno de Benoist, Erin McLean, Ines Egli, Mary Cogswell. Geneva. WHO, 2008.
3. Anorlu R.I., Oluwole A.A., Abudu O.O. Sociodemographic factors in anaemia in pregnancy at booking in Lagos, Nigeria; Journal of Obstetrics & Gynaecology, 2006; 26(8): 773-776.
4. Iman T.J., Yahaya A., Packed cell volume of pregnant women attending Danaku Kudu General Hospital, Kano state, Nigeria. Int. Jor. P. App. Scs, 2008; 2(2): 46-50.
5. Seshadu S. Nutritional anaemia in South Asia, Malnutrition in South Asia. A regional profile, 1997; 75-124.
6. Trends in Maternal Mortality: Estimate developed by WHO, UNICEF, UNFPA and the World Bank, 2008.
7. Ariba A.J., Inem A.V., Biersack G., Aina O.A., Ayankogbe O.O., Adetoro O.O. Pattern of Obstetrics Mortality in a Voluntary agency Hospital in Abeokuta, South West Nigeria. Nig Med Pract, 2004; 45(5): 83-90.
8. Isawumi A.I., Fasanu A.O., Akindele R. A., Oboro V. O, Oyeniran O. A. Maternal anaemia- an independent risk factor for perinatal mortality. BEST: IJTMITE, 2016; 4(6): 46-50.
9. Vanderjagt D.J., Brock H.S., Melah G.S., El-Nafaty A.U., Crossey M.J., Glew R.H. Nutritional Factors Associated with anaemia in Pregnant Women in Northern Nigeria. Journal of Health Population Nutrition, 2007; 25(1): 75-81.
10. MSuya S.E., Hussein T.H., Uriyo J, Sam N.E., Stray-Pederson B. Anaemia among pregnant women in Northern Tanzania: Prevalence, risk factors and effect on perinatal outcomes. Tanzan J Health Res, 2011; 13(1): 33-39.
11. WHO. Malaria in pregnant women, 2017

12. Adebisi O. Y., Strayhorn G. Anaemia in pregnancy and race in the United States: Blacks at risk. Fam Med, 2005; 37(9):655- 662.
13. Kalaivani K. Prevalence and consequences of anaemia in pregnancy. Indian J Med Res, 2009; 130: 627-633.
14. Mah-e-MunirAwan et al: A study of anaemia in pregnancy women of railway colony multan. Pakistan J. Med. Res, 2004; 43: 1.
15. Ogbeide O, Wagbatsoma V, Orhue A. Anaemia in pregnancy. East Afr Med J, 1994; 71(10): 671–673.
16. Rohilla M, Raveendran A, Dhaliwal LK, Chopra S. Severe anaemia in pregnancy, a tertiary hospital experience from northern India. J Obstet Gynaecol, 2010; 30(7): 694-696.
17. Lamina M.A; Sorunmu T.O; Prevalence of anaemia in pregnant women attending the antenatal clinic in a Nigerian university teaching hospital. The Nigeria Medical Practice, 2003; 44(2): 39-42.
18. WHO: Prevention and management of severe anaemia in pregnancy: Report of a technical working group. Geneva: WHO, 1993;(WHO/FHE/MSM/93.5).
19. Adekanle D.A, Isawumi A.I**:** Late Antenatal Care Booking and Its Predictors among Pregnant Women in South Western Nigeria. Online Journal of Health Allied Sciences, 2008; 7(1): 4.
20. Nwonwu E.U, Ibekwe P.C, Ugwu J.I, Obarezi H.C, Nwagbara O.C. Prevalence of malaria parasitaemia and malaria related anaemia among pregnant women in Abakaliki, South East Nigera. Niger J Clin Pract, 2009; 12(2): 182–186.
21. WHO. Micronutrient deficiencies. Iron deficiency anaemia. www.who.int.www.who.int/nutrition/topics/ida/en/index.html. Published 2011. Accessed 2011.
22. Johnson-Wimbley TD, Graham DY. Diagnosis and management of iron deficiency anemia in the 21st century. Ther Adv Gastroenterol, 2011; 4(3): 177–84.
23. Sharma J.B. Nutritional anaemia during pregnancy in non-industrial countries. In Studd.(Ed). Progress in Obstetrics & Gynaecology, 2003; 15: 103-122.
24. Channarin I. Folate deficiency in pregnancy. In: Channarin (ed.) The Megaloblastic Anaemias, 3rd edn. Oxford: Blackwell, 1990; 140-148.
25. Kaye D. Antenatal and intrapartum risk factors for birth asphyxia among emergency obstetrics referrals in Mulango hospital, Kampala, Uganda. East Africa Medical Journal, 2003; 80(3): 140- 143.
26. Sangeetha V.B, Drpushpalatha.S. Severe Maternal Anaemia and Neonatal outcome. Sch.J. App. Med. Sci, 2014; 2(1c): 303-309.
27. Muhammad T, Khattak A.A, Shafiq-ur-Rheman, Khan M.A, Khan A, Khan M.A. Maternal factors associated with intrauterine growth restriction. J Ayub Med Coll Abbottabad, 2010; 22(4): 64-69.
28. Bryant C, Larsen S Anaemia in pregnancy. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Obstetrics and Gynaecology Magazine, 2009; 11: 17-18.