International Journal of Research in Medical Sciences
Okunade KS et al. Int J Res Med Sci. 2014 May;2(2):607-611
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: 10.5455/2320-6012.ijrms20140545

Research Article

Perinatal outcome in anaemic pregnant women in South-Western Nigeria

Kehinde S. Okunade*, Maymunah A. Adegbesan-Omilabu, Ayodeji A. Oluwole

Department of Obstetrics & Gynaecology, Lagos University Teaching Hospital, Lagos, Nigeria

Received: 22 February 2014
Accepted: 1 March 2014

***Correspondence:**
Dr. Kehinde S. Okunade,
E-mail: kokokenny@yahoo.com, kehindeokunade@gmail.com

© 2014 Okunade KS et al. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Anaemia in pregnancy is a global public health problem in most developing and developed countries with major consequences for human health as well as social and economic development. Fetuses of anaemic mothers are at risk of preterm deliveries, low birth weights, morbidity and perinatal mortality due to the impairment of oxygen delivery to placenta and foetus.
Methods: This study was conducted at the antenatal clinic and labour ward complex of a teaching hospital in south-western Nigeria to determine the effect of anaemia in pregnancy on perinatal outcome. Eligible participants were enrolled for the study by consecutive sampling method. Relevant data were extracted from the case records of these eligible women and a structured interviewer administered questionnaire was used for the data collection.
Results: There were statistically significant differences between anaemia and reduced gestational age at birth (P = 0.000), low one-minute (P = 0.000) and five-minute (P = 0.003) Apgar scores, reduced birth weight (P=0.005) and foetal death (P = 0.013). No significant difference was noted in the rate of neonatal admission in the two groups (P = 0.085).
Conclusion: This study has thus highlighted the importance of considering maternal anaemia as an indicator of adverse perinatal outcomes. There is therefore, a need to counsel intending mothers and their partners about early antenatal booking, compliance with routine antenatal medications and prompt identification and treatment of anaemia in pregnancy, all as means of curtailing the overwhelming perinatal morbidity and mortality associated with the condition.

Keywords: Anaemia, Perinatal morbidity and mortality, Perinatal outcome, South-western Nigeria

INTRODUCTION

Anaemia in pregnancy is a global public health problem in most developing and developed countries with major consequences for human health as well as social and economic development. It is a major cause of morbidity and mortality especially in malaria endemic areas like Nigeria.[1] Anaemia is the commonest medical disorder of pregnancy where it has a significant impact on the health of the foetus as well as that of the mother.[2] It is a reduction in the haemoglobin concentration in the peripheral blood, below that adequate for age, sex and place of residence.[1]

WHO defined anaemia as the presence of haemoglobin concentration of less than 11g/dl, and it estimates that more than half of pregnant women in the World are anaemic.[3] However, in most parts of Africa, haemoglobin level < 10g/dl or Packed Cell Volume of <30% is used as indication of anaemia in pregnancy.[4,5] This level has been justified on the basis of the work of Lawson,[6] which showed that serious harm to the mother and fetus did not

occur until the haemoglobin value was below 10g/dl or packed cell volume less than 30%. Published rate of prevalence for anaemia in pregnancy in Africa is 35-36%.[7] The prevalence can even be as high as 61% in developing countries.[8]

The deleterious effects of anaemia in pregnancy include increased risk of maternal and foetal morbidity and mortality, preterm delivery, and low birth weight.[9] There is a 500-fold increased risk of maternal, perinatal and infant mortality in pregnant women with severe anaemia.[10,11] Foetuses of anaemic mothers are at risk of preterm deliveries, low birth weights, morbidity and perinatal mortality due to the impairment of oxygen delivery to placenta and foetus.[6,12,13] Moreover, babies whose mothers had anaemia in pregnancy during their first trimester in utero experienced higher rates of cardiovascular morbidities and mortalities in their adult lives than babies whose mothers did not have anaemia.[12]

This study therefore, is aimed to assess the socio-demographic factors of anaemic pregnant women attending the antenatal clinic of a teaching hospital in South-western Nigeria and to determine the effect anaemia on perinatal outcomes among these women.

METHODS

This is a prospective cross-sectional case-control study conducted at the antenatal clinic and labour ward complex of a teaching hospital in south-western Nigeria to determine the effect of anaemia in pregnancy on perinatal outcome.

The sample size (N) for each group in the study was determined using the statistical formula by Fisher.[14] While making provision for attrition rate of 10%, a total of 450 participants were enrolled for study by consecutive sampling method and they are grouped as follows:

GROUP-I (Case) - 225 women with anaemia

GROUP-II (Control) - 225 women without anaemia

Anaemia in pregnancy was defined in the study as those pregnancies in which maternal Packed Cell Volume (PCV) fall below 30%.[4-6]

Eligible participants were consenting pregnant women who have a singleton gestation. Exclusion criteria included pregnant women with multiple gestations, history of diabetes or hypertension, HIV, sickle cell anaemia and coagulopathies. Additional patients were excluded at delivery when records indicated significant intercurrent infections or other illness, preeclampsia or other gestational disorders.

Relevant data were extracted from the case records of these women and a structured interviewer administered questionnaire was used for the data collection. Gestational duration was based upon gestation from participants' last normal menstrual period confirmed or modified by ultrasound. Social classes were determined using the Oyedeji socio-economic classification scheme.[15]

All quantitative data were entered and analyzed using SPSS version 15.0. Chi square was used to test for the association between anaemia and perinatal outcomes. All significance were reported at P <0.05.

Ethical approval for the study was obtained from the hospital's health research and ethics committee and written consent obtained from each participant prior to involvement in the study.

RESULTS

A total of 450 pregnant women participated in the study with data completed for analysis in 400 of the enrolled women.

Table 1: Demographic characteristics of enrolled pregnant women (n=400).

	Anaemic N (%)	Non-anaemic N (%)	P value
Age (years)			
16-23	11 (5)	5 (2.8)	0.113
24-30	100 (45.7)	100 (55.3)	
31-37	87 (39.7)	56 (30.9)	
38-44	21 (9.6)	20 (11)	
Mean age	30.7 ± 4.7	31 ± 4.4	
Ethnicity			
Hausa	1 (0.5)	1 (0.6)	0.149
Ibo	112 (51.1)	110 (60.8)	
Yoruba	106 (48.4)	70 (38.6)	
Educational status			
No formal	18 (8.2)	16 (8.8)	0.99
Primary	5 (2.3)	4 (2.2)	
Secondary	62 (28.3)	49 (27.1)	
Tertiary	134 (61.2)	112 (61.9)	
Social class			
Class 1	22 (10.0)	26 (14.4)	0.158
Class 2	44 (20.1)	39 (21.5)	
Class 3	87 (39.7)	58 (32.1)	
Class 4	42 (19.2)	27 (14.9)	
Class 5	24 (11.0)	31 (17.1)	
Total	219 (100)	181 (100)	

Table 1 & 2 showed the association between the maternal demographic factors and anaemia. The age range for the women enrolled in the study was 16 to 44 years. There was no statistically significant difference between the mean ages for the anaemic and non-anaemic pregnant women (P = 0.113). There were also no significant differences recorded in the tribe (P = 0.149), educational

status (P = 0.990) and the social class (P = 0.158) of the enrolled in the case and control groups respectively.

Table 2: Inter-pregnancy interval and Parity of the study participants (n=400).

	Anaemic N (%)	Non-anaemic N (%)	P value
Inter-pregnancy interval (years)			
<2	119 (54.3)	69 (38.1)	0.001
>2	100 (45.7)	112 (61.9)	
Parity			
1	33 (15.1)	23 (12.7)	0.76
2-4	179 (81.7)	153 (84.5)	
≥5	7 (3.2)	5 (2.8)	
Total	219 (100.0)	181 (100.0)	

Table 2 showed that 54.3% of the anaemic women had inter-pregnancy interval of less than two years compared to only 38.1% of the non-anaemic pregnant women which demonstrated a statistically significant difference between anaemia and shorter inter-pregnancy interval (P = 0.001). A higher parity was also not found to be a significant risk factor for anaemia in the study groups (P = 0.76).

Table 3: Anaemia and perinatal outcomes among the study participants (n=400).

	Anaemic N (%)	Non-anaemic N (%)	P value
Gestational age at birth (weeks)			
<37	46 (21.0)	17 (9.4)	0.000
37-41	173 (79.0)	159 (87.8)	
>41	0 (0.0)	5 (2.8)	
APGAR score in one-minute			
<5	18 (8.2)	5 (2.8)	0.000
>5	201 (91.8)	176 (97.2)	
APGAR score in five-minute			
<7	16 (7.3)	2 (1.1)	0.003
>7	203 (92.7)	179 (98.9)	
Birth weight (kg)			
<2.5	49 (22.4)	21 (11.6)	0.005
>2.5	170 (77.6)	160 (88.4)	
Neonatal unit admission			
Yes	24 (11.0)	11(6.1)	0.085
No	195 (89.0)	170 (93.9)	
Foetal outcome			
Live birth	202 (92.2)	177 (97.8)	0.013
Still birth	17 (7.8)	4 (2.2)	
Total	219 (100.0)	181 (100.0)	

It was revealed in Table 3 that almost all the studied complications were more frequent in the anaemic study group compared to the non-anaemic group. There were statistically significant differences between anaemia and reduced gestational age at birth (P = 0.000), low one-minute (P = 0.000) and five-minute (P = 0.003) APGAR scores, reduced birth weight (P = 0.005) and foetal death (P = 0.013). No significant difference was noted in the rate of neonatal admission in the two groups (P = 0.085).

DISCUSSION

In this study, the proportion of pregnant women with anaemia was not inversely related to their age as reported by other authors in Nigeria.[16,17] The age group 24-30 years had the highest prevalence of anaemia (45.7%) which agrees with the findings in studies done in Enugu and Benin City[18,19] where it had been related to the effect of parity on increasing maternal age. The influence of age has often not been separated from the effect of parity and pre-pregnancy nutritional status. These have been identified as risk factors of anaemia among pregnant adolescents due to depleted iron stores that occurred during the adolescent growth spurt.[11] Some other studies from Africa have confirmed the findings of this study, that age alone is not a significant determinant of haemoglobin value in pregnancy.[11,17]

Our also study revealed no substantial increase in the occurrence of anaemia in pregnancy due to tribe, educational status and social class of the enrolled women. These findings were at variance with previous studies[17,20] that reported association between these important socio-demographic factors and anaemia in pregnancy. Selection factors may be responsible for these findings as our hospital is a fee paying centre attracting clients mainly (70.0%) from the middle to higher socio-economic strata and largely from the Yoruba and Ibo ethnic groups.

High parity, which WHO defines as five or more pregnancies with gestation periods of ≥20 weeks,[21] is regarded among the factors with aetiologic potential in causing anemia in pregnancy.[22] Various authors provided inconsistent evidence of this association as some studies[23-25] like this present study found no evidence of such an association; others have reported an increase in the risk of anaemia in pregnancy.[26-28]

The higher risk of anaemia among women with shorter pregnancy intervals in the present study is similar to the findings in previous studies.[17,29] This short interval between pregnancies, delays the mother's recovery from the effects of previous pregnancies thus increasing the risk of maternal depletion syndrome. Since the foetal demand is met first, the mother is left with further depleted iron stores and thus anaemia develops. It has been shown that the exhausted maternal iron stores at the end of one pregnancy takes almost two years to be replenished.[30]

Maternal anaemia is considered a risk factor for adverse perinatal outcome. In this study there is a high frequency of preterm births and low birth weight in babies born to anaemic mothers as compared to those born to non-anaemic mothers. This was similar to the findings

reported by other authors.[31-33] Our study also showed strong associations between anaemia in pregnancy and low APGAR scores with subsequent increased perinatal morbidity (neonatal unit admission) and mortality; which is cconsistent with findings from similar studies by Bondevik[34] and Marhatta[35] in Nepal. This may be attributed to the impairment of oxygen delivery to the placenta and the foetus.[6,12,13]

This study is hospital based and the findings may not be representative of the general population; therefore our findings are valid only for women booking at similar tertiary hospitals like ours in Nigeria. Our figures may also underestimate the burden of anaemia in pregnancy, since majority of women either attend antenatal care at primary health care centers, in general hospitals or do not attend at all.

CONCLUSION

This study has however highlighted the importance of considering maternal anaemia as an indicator of adverse perinatal outcomes. Identified risk factors in this study were not totally different from previously identified factors in various studies; however, there is a need to emphasize and counsel intending mothers and their partners about ensuring adequate child-spacing, preconception care and optimization, need for early antenatal booking, compliance with routine antenatal medications including iron and folate supplementation and prompt identification and treatment of anaemia in pregnancy, all as means of curtailing the overwhelming perinatal morbidity and mortality associated with the condition.

ACKNOWLEDGEMENTS

The authors acknowledge the entire staff of the medical record department of the hospital and the resident doctors in the department of obstetrics and gynaecology for all their logistical supports, without which this study would not have been possible.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the hospital's health research and ethics committee

REFERENCES

1. Ekem I, Obed SA. Anaemia in pregnancy. In: Kwawukume, EY, Emuveyan EE, eds. Comprehensive Obstetrics for the Tropics. 1st ed. Accra: Ashante & Hittscher Printing Press Limited; 2002: 297-302.
2. Milman N. Anemia: still a major health problem in many parts of the world. Ann Hematol. 2011;90:369-77.
3. World Health Organisation. WHO Global Database on Anemia, 2008. Available at: http://who.int/vmnis/anaemia/data/database/countries/ken_ida.pdf. Accessed 30 January 2008.
4. Abudu OO. Anaemia in pregnancy. In: Agboola A, eds. Textbook of Obstetrics and Gynaecology for Medical Students. 1st ed. Lagos, Nigeria: University Services Education Publishers; 1988: 72-78.
5. Harrison KA. Anaemia in pregnancy. In: Lawson J, Harrison KA, Bergstrom S, eds. Maternity Care in Developing Countries. 1st ed. London: RCOG Press; 2001: 113-128.
6. Lawson RJ. Anaemia in pregnancy. In: Lawson JB, Steward, eds. Obstetrics and Gynaecology in Tropics and Developing Countries. Edward Arnold Publ., 1983; 73-79
7. Ogunbode O. Anaemia in pregnacy. In: Okonofua F, Odunsi K (Eds). Contemporary Obstetrics and Gynaecology for Developing Countries. 1st ed. Benin City: Women's Health and Action Research Centre; 2003: 515-529.
8. World Health Organization. Prevention and management of severe anaemia in pregnancy: report of a technical working group. In: WHO, eds. WHO Report. Geneva: WHO Press; 1994: 1-35.
9. Aziken M. E. Anaemia in pregnancy. In: Eugene Okpere, eds. Clinical Obstetrics. 1st ed. Benin City: UNIBEN press; 2004: 51-55.
10. Santiso R. Effects of parasitosis on women's health. Int J Obstet Gynaecol. 1997;58:129-36.
11. Hoque M. Prevalence of anaemia in pregnancy at Greytown, South Africa. Trop J Obstet Gynaecol. 2006;23(1):3-7.
12. Brabin B. J. The risks of severity of malaria in pregnant women. Applied field research in malaria. In: WHO, eds. WHO Report. Geneva: WHO Press; 1991: 1-34.
13. De Mayer E. M.: Preventing and controlling iron deficiency anaemia through primary health care. In: P. Dallman, J. M. Gurney, L. Hallberg, S. K. Sood, S. G. Srikantia, eds. WHO Guide. Geneva: WHO Press; 1989: 5-54.
14. Bernard A. Rouser. Nonparametric methods. In: Bernard A. Rouser, eds. Fundamentals of Biostatistics, International Students Edition. 3rd ed. Boston: PWS-KENT Publishers; 1990: 348-352.
15. Oyedeji GA. Socioeconomic status and cultural background of hospitalized children in Ilesa. Nig J Paediatr. 1985;12(4):111-7.
16. World Health Organization. The prevalence of anaemia in women: a tabulation of available information. In: WHO, eds. WHO Guide. Geneva: WHO Press; 1992: 119-124.
17. Anorlu RI, Oluwole AA, Abudu OO. Sociodemographic factors in anaemia in pregnancy at booking in Lagos, Nigeria. J Obstet Gynaecol. 2006;26(8):773-6.
18. Chukwudebelu WO, Obi GO. Anaemia in pregnancy in Nigerians. Nig Med J. 1979;9:221-3.
19. Obbeide O, Wagabtsoma V, Orhue A. Anaemia in pregnancy. East Afri Med J. 1994;71:671-3.

20. Van den Broek. Anaemia in pregnancy in Southern Malawi: prevalence and risk factors. Brit J Obstet Gynaecol. 2000;107:445-51.
21. Aliyu MH, Jolly PE, Ehiri JE, Salihu HM. High parity and adverse birth outcome: exploring the maze. Birth. 2005;32(1):45-59.
22. Rooney C. Antenatal care and maternal health: how effective is it? A review of the evidence. In: World, eds. WHO Review. Geneva: WHO Press; 1992: 4-74.
23. Fayed HM, Abib SF, Stevens B. Risk factors in extreme grandmultiparity. Int J Gynaecol Obstet. 1993;41:17-22.
24. Toohey J, Keegan JR, Morgan M et al. The dangerous multipara: Fact or fiction? Am J Obstet Gynecol. 1995;172:683-6.
25. Humphrey MD. Is grand multiparity an independent predictor of pregnancy risk? A retrospective observational study. Med J Aust. 2003;179:294-6.
26. Rizk DE, Khalfan M, Ezimokhai M. Obstetric outcome in grand multipara in the United Arab Emirates: a case control study. Arch Gynecol Obstet. 2001;264:194-8.
27. Kumari AS, Badrinath P. Extreme grandmultiparity: is it an obstetric risk factor? Eur J Obstet Gynecol Reprod Biol. 2002;101:22-5.
28. Ozumba BC, Igwegbe AO. The challenge of grandmultiparity in Nigerian obstetric practice. Int J Gynaecol Obstet. 1992;37:259-64.
29. Nwizu EN, Iliyasu Z, Ibrahim SA, Galadanci HS. Socio-demographic and maternal factors in anaemia in pregnancy at booking in Kano, northern Nigeria. African J Reproduct Health. 2011;15(4):33.
30. Adinma JIB., Ikechebelu JI., Onyejimbe UN., Amilo G. Influence of antenatal clinic on the haematocrit value of pregnant Nigerian Igbo women. Trop J Obstet Gynaecol. 2002;19(2):68-70.
31. Karaoglu L, Pehlwan E. The Prevalence of nutritional anaemia in pregnancy in an East Anantolo province, Turkey. BMC Public Health. 2010;10:329.
32. Scanlon KS, Schieve LA, Cogswell ME. High and low haemoglobin levels during pregnancy: differential risks for preterm birth and small for gestational age. Obstet Gynecol. 2000;96:741-48.
33. Lone FW, Qureshi RN, Emmanuel F. Maternal anaemia and its impact on perinatal outcome. Trop Med Int Health. 2004;9:486-90..
34. Bondevik GT, Ulstein M, Kvale G. Maternal hematological status and risk of low birth weight and preterm delivery in Nepal. Acta Obstet Gynecol Scand. 2001;80:402-8.
35. Marhatta R. Study of anaemia in pregnancy and its outcome in Nepal medical college teaching hospital, Kathmandu, Nepal. Nepal Med Coll J. 2007;9:270-4.

DOI: 10.5455/2320-6012.ijrms20140545
Cite this article as: Okunade KS, Adegbesan-Omilabu MA, Oluwole AA. Perinatal outcome in anaemic pregnant women in South-Western Nigeria. Int J Res Med Sci 2014;2:607-11.