EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 11
Issue: 8
XX-XX
Year: 2024

PREVALENCE OF ANAEMIA ANDMANAGEMENT AMONG PREGNANT WOMEN IN A NIGERIAN TERTIAL HOSPITAL

[1]Dr. Amaka A. Mgbahurike and [2]Q. Olekanma

[1,2]Department of Clinical Pharmacy and Management, Faculty of Pharmaceutical Sciences, University of Port Harcourt, Nigeria.

***Corresponding Author: Dr. Amaka A. Mgbahurike**
Department of Clinical Pharmacy and Management, Faculty of Pharmaceutical Sciences, Universityof Port Harcourt, Nigeria.

Article Received on 25/06/2024 **Article Revised on 15/07/2024** **Article Accepted on 04/08/2024**

ABSTRACT
Anaemia, a global public health challenge, is a reduction in the haemoglobin concentration in the peripheral blood, below that adequate for age, gender and place of residence. About 20% of maternal deaths in Africa have been attributed to anaemia and babies whose mothers had anaemia in pregnancy during their first trimester in-utero experienced higher rates of cardiovascular morbidity and mortality in their adult life than babies whose mothers did not have anaemia. This study aimed to determine the prevalence of anemia and its drug managementamong pregnant women who attended the Obstetrics and Gynecology Clinic of UPTH between July 2023 and December 2023.A total of 200 pregnant women were randomly selected after calculating the sample size. Data extractedfrom the patients' folders include: demographic data (age, social status, ethnic group), gestational age, packed cell volume (PCV)(before and after drug use), medications used for management. The PCV value was used as a marker for anemia. Structured questionnaire was administered to those who gave their consent to obtain the effectiveness of the medication/s used. The result showed that the prevalence of anaemia in this study is 43.5% with the moderate anaemia being the commonest (42.5%). Severity and prevalence of anaemia in pregnancy increased with gestational age from 7% in the first trimester, 24.5% in the second trimesterto 58.5% in the third trimester. Ikwerres have a prevalence of 12.5%, Yorubas 28.5%, Igbos 36% and 18% among other ethnic groups in Rivers State. Iron supplement, folic acidand vitamin B12 supplement usage among pregnant women were 19%, 30.5% and 26% respectively. The study identified a correlation between anaemia and parity independent of its impact on fetal health. Maternal anemia increases the risk of maternal morbidity, therefore, it is very important to prevent and to treat maternal anemia.

KEYWORDS: Anaemia, prevalence, pregnant women, Pack cell volume.

INTRODUCTION
Anaemia in pregnancy is a global public health challenge.[1] It is a reduction in the haemoglobin concentration in the peripheral blood, below that adequate for age, sex and place of residence.[2] Because of the increased iron requirements in pregnancy and during growth, pregnant women and infants are recognized as the groups most vulnerable to iron deficiency anaemia. World Health Organization (WHO) defined anaemia in pregnancy 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] the prevalence may however be as high as 56% or 61% in developing countries.[3] In most parts of Africa, haemoglobin level of less than 10g/dl is used as indication of anaemia in pregnancy[5] In pregnancy, anaemia has a significant impact on the health of the foetus as well as that of the mother.[1] About 20% of maternal deaths in Africa have been attributed to anaemia[6] and babies whose mothers had anaemia in pregnancy during their first trimester in utero experienced higher rates of cardiovascular morbidity and mortality in their adult life than babies whose mothers did not have anaemia[7] Women often become anaemic during pregnancy because the demand for iron and other vitamins is increased due to physiological burden of pregnancy.[8] The inability to meet the required level for these substances either as a result of dietary deficiencies or infection gives rise to anaemia to be consistent. The cause of anaemia in the developing country is usually multifactorial.[9] Anaemia is an indicator of nutritional deficiencies that significantly contribute to birth defects, preterm labour and low birth weight; hence it causes global public health problem. However, iron deficiency anaemia is a leading cause of maternal morbidity and mortality, prenatal and perinatal infant loss; physical and cognitive losses thus in developing countries stall social

and economic development. In sub-Saharan countries, including Nigeria, the magnitude of anaemia in pregnancy is quite alarming, whereby its prevalence is widely contributed by poor nutrition, iron and other micronutrients deficiencies, parasitic infestations, chronic infections, illiteracy, and short pregnancy intervals.[10]

Therefore, this study was aimed to determine the prevalence of anaemia in pregnancy among pregnant women in Niger delta region. and to identify the confounding socio-demographic factors among pregnant women at the University of Port Harcourt Teaching Hospital, which is the study site.

MATERIALS AND METHODS

Study area The University of Port Harcourt Teaching Hospital is an 882-bed hospital located at Alakahia in Obio-Akpor local government area of Rivers State, South-South Nigeria. An average of 2500 deliveries are conducted annually. The unit has a total of 40 beds in the postnatal ward, 40 beds in the unbooked ward, 13 beds in the first stage room, and 8 beds in the private/semi-private rooms. There are five units; each unit has five consultant obstetricians, five specialist senior registrars and five registrars with many experienced midwives.

Study design

The study adopted a retrospective cross-sectional study design and questionnaires. The packed cell volume of the pregnant women were extracted from patients' folder of the Obstetrics and Gynaecology Unit. A structured, self-administered questionnaires was designed and used to collect necessary information.

Sample size

Sample size was calculated using Araoye formula[11]

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

Where n is desired sample size; Z is standard deviation, usually set at 1.96 which correspond to 95% confidence interval; P is proportion of pregnant women with anemia, which is 60% (0.6); and q is the complementary proportion, equivalent to 1 -0.6; d is the degree of accuracy desired, absolute precision, which is 5% (0,5).

$$n = \frac{(1.96)^2 \times 0.60\ (1 - 0.6)\ 0.092194}{(0.05)^2 0.0025} = 368.8$$

This value was rounded up to 400 for sample size

Ethical Consideration

Ethical clearance for this research was sought and obtained from the University of Port Harcourt Teaching Hospital (UPTH) Ethics and Research committee. Pregnant women and all participants were educated on the relevance of the study and included in the research based on their consent to participate.

Inclusion Criteria

1. All pregnant women who attended antenatal clinic in the Obstetrics & Gynaecology Unit of UPTH with in the study period July 2023 –December, 2023).
2. Pregnant women who are willing to participate in the study

Exclusion Criteria

1. Pregnant women who were too sick or not willing to participate in the study
2. Pregnant women who had recent blood transfusion

Data Collection

Data on the demographic variables, comorbidity, PCV, and drugs/s used for the management of the anaemic was collected by a printed questionnaire distributed during antenatal clinics before patients are seen by the physicians. An informed consent was obtained from the participants before administering the questionnaire. Participants were educated on how to fill the questionnaire and were guided throughout the process. This process was done with the help of the nurse on duty. Data was cleaned and sorted with Microsoft Excel for completeness. After cleaning and validation, samples were coded with numbers according to the options in the questionnaire and scaled. This was then exported to SPSS for data analysis.

Packed Cell Volume (PCV)

The data of packed cell volume of pregnant women was retrieved from the patients' folders.

The World Health Organization PCV range of classification of anemia in pregnancy guide was used as: Normal: PCV ≥ 34%; Mild anemia PCV 27 -33%; Moderate anemia PCV 19 - 26%; and Severe anemia PCV < 19%. (12)

Statistical Analysis

Data obtained were analyzed using Statistical Package for the Social Sciences (SPSS) IBM Version 23. A total of 400 questionnaires were filled out. Descriptive statistics were computed for all relevant data. Chi-square was used to test for the association between anaemia and demographic information in pregnancy.

RESULTS

Demographic Characteristics of Anemic Patients

The demographic characteristics of anaemic patients presented on Table 1, showed that 9.8% (39) of pregnant women were between the ages of 20 and 24 years, 18.5% (74) are between 25 and 29 years of age, 47.8% (191) are aged 30 to 34 years, 17.2% (69) are between 35 to 39 years, while 6.7% (27) were ≥40 years Majority 53.4% (213) of the pregnant women who participated in the study were married and were living with their partners while a good number 33.7% (135) were single and were living independently. Meanwhile a few 6.2% (25) were single but living with their partners, and 6.7% (27) were married but not living with their partners.

Level of education of pregnant women assessed in the study showed that 11.6% (47) women did not acquire a formal education, while 29.4% (117) had primary education, as majority 44.2% (179) had secondary education, as few 14.7% (57) had tertiary education.

Employment status of the participants indicated that most of these women were employed, 62.5% (250). Though a larger fraction of this group, 42.3% (169), were self-employed. Most of these participants were of Ikwerre ethnic origin 36.8% (148); Yoruba 10.4% (42); Igbo 20.8% (83), other ethnic groups other than the previously mentioned 31.9% (127).

Table 1: Socio-demographic variable ofpregnantwomen who attended Obstetrics & Gynaecology with in the study period.

Variable	Frequency (N=400)	Percentage (%)
Age (years)		
20-24	39	9.7
25-29	74	18.5
30-34	191	47.7
35-39	69	17.3
40 and above	27	6.8
Marital Status		
Single but living with partner	25	6.3
Single and not living with partner	135	33.7
Married and living with partner	213	53.3
Married and not living with partner	27	6.7
Level of Education		
No formal education	47	11.7
Primary	117	29.3
Secondary	179	44.7
Tertiary	57	14.3
Employment Status		
Unemployed	67	16,7
Civil servant	128	32.0
Self employed	65	16.3
Private institution employed	140	35.0
Ethnicity		
Ikwerre	148	37.0
Yoruba	42	10.5
Igbo	83	20.8
Others	127	31.7

Table 2: Prevalence of Anaemia among pregnant women who attended antenatal clinic at O & G of UPTH Hospital.

Gestation Age (Weeks)	Frequency (N=400)	Proportion (%)
<13	28	7
13 - 28	98	24.5
>28	234	58.5
No Response	40	10
Number of Parity		
None	24	6.0
1	36	9.0
2	82	20.5
3	104	26.0
4+	138	34.5
No Response	16	4
Anaemia Diagnosis		
Before Pregnancy	176	44
After Pregnancy	224	56
Anaemic Duration(months)		
< 1	56	14

2 to 4	170	42.5
5 to 7	106	26.5
>8	38	9.5
No Response	30	7.5
Anaemia Medication Commencement		
During Pregnancy	232	58
After Pregnancy	154	38.5
No Response	14	3.5
Anaemia Medication Duration (weeks)		
<6	70	17.5
7 to 12	156	39
13 – 18	58	14.5
>18	92	23
No Response	24	6

Gestational periods of the participants are shown in Table 2.
The result showed that 28 (7%) had less than 13 weeks of gestational period at the time of the study, and 98 (24.5%) were within 13 to 28 weeks gestational period, while majority 234 (58.5%) were at 28 weeks and above, as gestational period of 40 (10%) were not known.

Packed cell volume of pregnant women who participated in the study shown in Table 3 indicates that most {226 (56.5%)} of the participants had PCV greater than or equal to 33g/dl. This is followed by 142 (35.5%) whose PCV ranged from 27 to 32.9g/dl. Only 12 (3%) of participants have PCV less than 21, while 10 (5%) of them had PCV between 22 and 26.9.g/dl.

Table 3: Packed Cell Volumepregnantwomen who attended O& G Unit within the study period.

PCV (g/dl)	Proportion N = 400	Percentage (%)
≤21	12	3
22 - 26.9	20	5
27 - 32.9	142	35.5
≥33	226	56.5

Prevalence of Anaemia amongthe pregnant women who participatedin the study Condition of Health (Anemic stage).

Mild	84	21%
Moderate	220	55%
Severe	96	24%

The result showed that most, 220 (55%) of the respondents had moderate anaemia.

Other parameters assessed include respondents' parity, period of anaemia diagnosis, medication commencement and duration of therapy. The result showed that 138 (34.5%) hadfour[4] or more previous pregnancies, while 36 (9%) had only one previous pregnancy. From the study, 44% (176) of the study population were diagnosed for anaemia before their pregnancy while the remaining 56% (224) were diagnosed of anaemia after positive pregnancy test. Out of the 400 sampled population, 14% (56) are positive with anaemia for less than one month, 42.5% (170) has been with anaemia for 2 to 4 months, 26.5% (53) have been diagnosed for 5 to 7 months, 9.5% (19) are anaemic for more than 8 months, and 7.5% (15) are not open to the duration of their anaemic condition.

The result also indicated that 116 (58%) commenced therapy for anaemia during pregnancy, while 77 (38.5%) commenced medication before pregnancy, and 7 (3.5%) did not indicate if their commencement of medication was before or during pregnancy.

Meanwhile, the duration of therapy was less than six weeks in 70 (17.5%) pregnant women. Duration of therapy among the women in the study was less than 6 weeks for 70 (17.5%) women, between 7 to 12 weeks for 156 (39%) women, between 13 to 18 weeks for 58 (14.5%), and greater than 18 weeks for 92(23%) women. However, the duration for anaemia therapy was not revealed by 24 (6%) of the women in the study.

Drug Management of Anaemic Medications
The drugs used in the management of anemia among the study group is given in Table 4. The result showed that folic acid is the most (136 (34%) commonly used for the anaemia management followed by Vitamin $B_{12,}$ 104 (26%). Iron supplement was the least 76 (19%) used for the therapy.

Table 4: Drugs Used in Management of Anaemia among the study population.

Medications FrequencyPercentage		
Iron Supplement	76	19%
Folic Acid Supplement	136	34%
Vitamin B_{12} Supplement	104	26%
Combination (Folic acid +Iron suppl.)	84	21%
Side Effects		
Yes	65	16.3%
No	330	82.5%
No Response	5	1.2%
Follow-up Appointments		
Rarely	106	26.5%
Occasionally	140	35%
Regularly	150	37.5%
No Response	4	1.0%
Improvement		
Yes	306	76.5%
No	88	22.0%
No Response	6	1.5%
Effectiveness		
Very Effective	210	52.5%
Somewhat Effective	120	30%
Not Effective	65	16.3%
No Response	5	1.2%

Table 3 is a checklist of management and outcome of anaemia. From the result, 76 (19%) women are on iron supplement, 136 (34%) women are on folic acid supplement, 104 (26%) women vitamin 12 supplement, 84 (21%) women are on combination therapy.

Out of the 400 respondents, 65 (16.3%) women reported side effects from supplements, 330 (82.5%) had no counter reactions, and 5 (1.2%) women did not respond.

Results on follow-up appointments to anaemia therapy among the study group indicated that majority, 150(37.5%) were regular, while 106 (26.5%) rarely, as 140 (35%) occasionally attend follow up appointments.

DISCUSSION

The prevalence of anaemia in this study is 43.5%. This resonates with WHO (2022) global prevalence rate of 50% and 55.9% but lower than the study reported by Ola dipo et al., (2015)[13] finding across four Nigerian states of 61.2 – 88.7%. Moderate anaemia is the commonest type found in this study with a prevalence of 42.5%. Mild and severe cases have 21% prevalence. In another study[14] a prevalence of 2.0% was reported for severe anaemia, while another study[15] recorded 6.6% for moderate type of anemia. and a similar study[16] observed 91.4% of mild anaemia among pregnant women in the Northern part of Nigeria. Meanwhile, Demmouche et al., 2021[17] reported a prevalence of 49.48% for moderate type of anaemia in another study. Although mild to moderate anaemia is generally well-tolerated, it clearly adversely affects the sense of well-being, resulting in fatigue and a decrease in work capacity.

Advancing gestational age significantly increased the risk of anaemia. Severity and prevalence of anaemia in pregnancy increased with gestational age from 7% in the first trimester, 24.5% in the second trimester and 58.5% in the third trimester. Idowu et al., 2015[18] recorded 60.6% prevalence in the second trimester. However, a similar study[19] observed highest prevalence (80.8%) in the third trimester. Compared to the first trimester, a lower hemoglobin level in the second and third trimester is partly artifactual and is due to a physiological expansion of maternal plasma volume, making it more or less difficult to separate out women who are truly anaemic.

Quite a number of them booked late for antenatal care and 58.5% of these women were attending antenatal care clinic for the first time. The relative prevalence of anaemia in the third trimester was indicated by more than half of women attending antenatal care for the first time.

Women with primary education had the least prevalence (16%) of anaemia. This report is contrary to popular view that level of education is inversely proportional to anaemic contraction.[20] This is same with married women living with their spouse (10%) and women that are self-employed (15%). 58.6% of all women were in their third trimester, which constituted 88.9% of the women who had attended antenatal care clinic more than five times. Working class women and women living with partners are susceptible to low prevalence less than 30% owing to high socio-economic status. Proper and adequate care are precursory for women and tends to reduce the risk of anaemia susceptibility.

There is relationship between anaemia, aging, and ethnicity.[21] The current study observed a prevalence of 12.5% among Ikwerres, 28.5% among Yorubas, 36% among Igbos and 18% among other sub-ethnic groups in Rivers State. In asimilar study,[22] it was reported that Caucasians were the largest ethnic group within their patient population (73.3%), followed by African-Americans (10%), Hispanics (8.6%), Asians (2.4%) and other ethnicity (4.8%). The prevalence of anemia varies by ethnicity and this may be attributed to their varying diet.

There is a significant correlation between anaemia and parity.[16] Anaemia prevalence among women increases with parity as: none (6%), mono parity (9%), di-parity (18%), tri-parous (28.5%) and a parity of 4 and above (34.5%). Meanwhile, a higher prevalence of anaemia (85.3%) among grand multiparous women[16] was reported while only 66.5% of multiparous (para 2-4) and 65.5% of all primigravida women had varying degrees of anaemia, showing that there is a correlation between anaemia and parity.

There was a statistically significant association between increasing maternal age and prevalence of anaemia. Women aged between 30 and 34 years have the highest prevalence (30%) while maternal age of 25 to 29 years had the least prevalence of 18.5%, while 2% to 5% of American teenagers were reported with iron deficiency.[23] In a recent study in Brazil, in São Paulo, the prevalence of anemia in pregnant adolescents was 14.2%.[24] Generally, teenagers and adolescents have the highest rate of anaemia prevalence,[25] and it was pointed out that adolescence is a risk factor for maternal anaemia. Independent of its impact on fetal health, maternal anemia increases the risk of maternal morbidity. Therefore, it is very important to prevent and to treat maternal anemia. Comorbidity to anaemia among pregnant women in this study are infection (21.5%), gestational diabetes (21.5%), hypertension (28%) and other categorize diseases (14%).

CONCLUSION

Nearly half of the study population of pregnant women were anaemic. This study showed that the prevalence of anaemia is still high among women who visited the University of Port Harcourt Teaching Hospital during the study period, mostly occurring among women of high parity and in the third trimester of pregnancy. Efforts must be intensified to address this condition through the use of supplements and adequate counselling on the need to fully recover from the effects of one pregnancy before embarking on another.

REFERENCES

1. Milman N, Anaemia still a major health problem in many parts of the world. Ann Hematol, 2011; 90: 369–377.
2. Ekem I, & Obed SA. Anaemia in pregnancy. In: Kwawukume, EY, Emuveyan EE (Ed). Comprehensive Obstetrics for the Tropics. Accra: Ashante and Hittscher Printing Press Limited, 2020; 297-302.
3. World Health Organization Vitamin and Mineral Nutrition/ Anaemia. WHO, 2018.
4. World Health Organisation The prevalence of anemia in women: Tabulation of available Information. Geneva WHO, 2019.
5. Abudu, O. O. Anaemia in pregnancy. In: Agboola A (Ed). Textbook of Obstetrics and Gynaecology for medical students. University Services Education Publ, 2017; II: 72-78.
6. Harrison KA. (2015). Anaemia in pregnancy. In: Carson J, Harrison KA, Bergston S, (eds). Maternity Care in Developing Countries. London, UK: RCOG Press., 2001. 112-128.
7. Brabin, BJ. The risks of severity of malaria in pregnant women. Applied field research in malaria; Report No 1 World Health Organization, Geneva, 2016.
8. Idowu OA, Mafiana CF,& Sotiloye D. (2005). Anaemia in pregnancy: A survey of pregnant women in Abeokuta, Nigeria. Afr Health Sci, 2005; 5: 295–299.
9. Van den Broek N. (2016). The cytology of anaemia in pregnancy in West Africa Tropical Doctor, 2016; 26: 5-7.
10. Agan, T., Ekabua, J. E. Udoh, A. E. Ekanem, E. I., Efiok, E. and M. A. Mgbekem (2010). "Prevalence of anemia in women with asymptomatic malaria parasitemia at first antenatal care visit at the University of Calabar Teaching Hospital, Calabar, Nigeria," International Journal of Women's Health, 2010; 2(1): 229–233.
11. Araoye M.O. (2004). Sample size determination in Araoye M.O. (Ed) Text book of Research Methodology with statisticsfor healthand socialscientists, Nathadex, Ilorin, Nigeria, 2004; 117-120.
12. WHO. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. World Health Organization. 2011. Cited 2022 July 24. Available from: https://apps.who.int/iris/handle/10665/85839
13. Oladipo, A. R., Falana, A. O., Adegoke, O., Sambo, A. and Kungu, J. (2015). Prevalence of Anaemia Among pregnant Women and its Determinants in Northern Nigeria.
14. Owolabi, M. O., Owolabi, A. O. and OlaOlorun, D. A. Sociodemographic factors in anaemia in pregnancy in southwestern Nigeria. South Africal Family Practice, 2021; 54(3): 222-227.
15. Harrison K.A. Maternal Mortality and Anaemia in Pregnancy. W. Afr. Med. J., 1975; 23: 27- 31.
16. Mohammad, Y. G. and Emmanuel A. U. (2013). The pattern of anaemia in Northern Nigerian women. Journal of Medicine and Medical Sciences, 2013; 4(8): 319-323.
17. Demmouche, A., Khelil, S. and Moulessehoul, S. (2021). Anemia Among Pregnant Women in the Sidi

Bel Abbes Region (West Algeria): An Epidemiologic Study. Journal of Blood Disorders and Transfusions, 2: 113.

18. Gedefaw L, Ayele A, Asres Y, Mossie A. Anemia and Associated Factors among pregnant women attending antenatal care clinic in Wolayita Sodo town, SouthernEthiopia. Ethiop J Health Sci, 2015; 25: 155‑62.
19. Dim C, Ugwu E, Dim N, Anyaehie U. Hematocrit, anemia, and arm preference for blood sample collection: A cross‑sectional study of pregnant women in Enugu, South‑Eastern, Nigeria. Ann Med Health Sci Res, 2015; 5: 36‑41.
20. Paul, B. A., Lucy, I., Mary, D. N., Godwin, A. O., Seljul, R. M., Olugbenga, O. T., Kurgnan, P. J., Nneka, O. V., Seye, O. J., Ehi, A. W., Ojoma, A. V., Kate, A. E. and Olufunmilola, O. O. (2016). Prevalence of Anaemia in Pregnancy Among Women Visiting Antenatal Clinic in Bingham University Teaching Hospital Jos, Nigeria. Clinical Medicine Research, 5(3): 52-62.
21. Smith, D. (2022). Management and treatment of anemia in the elderly. Clinical Geriatrics, 2022; 10: 47-53.
22. Igbinosa, Irogue I, Leonard, Stephanie A.; Noelette, Francecsa BA; Davies-Balch, Shantay; Carmichael, Suzan L. MS; Main, ElliottLyell, Deirdre J. (2023) Racial and Ethnic Disparities in Anemia and Severe Maternal Morbidity Obstetrics & Gynecology, 2023; 142(4): 845-854. DOI: 10.1097/AOG.0000000000005325
23. Looker AC, Dallman PR, Carroll MD, et al., (1997)Prevalence of Iron deficiency in United Sates. JAMA, 1997; 277(12): 973-976. Doi:10.1001/jama.1997.035403360041028
24. Fujimori, E., Oliveira, I. M. V., Nuñez de Cassana, L. M. and Szarfarc, S. C. (2019). Estado Nutricional del hierro de gestantes adolescentes, São Paulo, Brasil. Arch Latinoamer Nutr, 2019; 49: 8-12.
25. Dairo MD, Lawoyin TO. Socio-demographic determinants of anaemia in pregnancy at primary care level: A study in urban and rural Oyo State, Nigeria. Afr J Med Med Sci., 2024; 33: 213-7.