Prevalence of Anaemia among Pregnant Women in the First Antenatal Care (ANC) Clinic Visit in St. Mary's Hospital Okpoga, Okpokwu Local Government Area, Benue State, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

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ABSTRACT

Aims: The study was carried out to determine the prevalence of anaemia among pregnant women attending St. Mary's Hospital Okpoga, Benue State, Nigeria, with respect to demographic factors, socio-economic and underlying medical determinants among pregnant women.
Methodology: A retrospective study design was used for the study. The study of 858 pregnant women who booked for antenatal care (ANC) between March 2019 to March 2020 was done. Their records were retrieved from the Records Department and the ANC unit using a standard proforma.
Results: The findings revealed that prevalence of anaemia among pregnant women at booking was (55.2%). The highest prevalence of anaemia by age range 15-20 years was (62.2%), by educational status, highest prevalence was among those with no formal education (84.3%), by occupation highest prevalence was among house wives (59.9%). By underlying medical condition – severe form of parasitaemia (78.5%), by degree of severity, mild form of anaemia 74.1%, was most prevalent. By parity, it was highest among multiparous women (66.9%), by habitants it was highest among rural habitants (73.9%) while prevalence by gestational age it was highest among pregnant

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mothers who were in their 3rd trimester (60%) in the first antenatal care (ANC) visit.
Conclusion: Pregnant mothers need to book early for antenatal clinic to access services such as intermittent preventive treatment, uptake of iron supplements and anthelmintics. They should also be empowered economically to access ANC in order to reduce the problem of anaemia in pregnancy.

1. INTRODUCTION

Anaemia in pregnancy is a global public health problem. It is major concerns for human health as well as economic development in Africa especially in Nigeria. Anaemia is a decrease in the concentration of circulating red blood cells and a concomitant impaired ability to transport oxygen because of low haemoglobin concentration is less than10g/dl or packed cell volume (PCV) is less than 30% [1].

World Health Organization reported that about 56 million pregnant women are affected by anaemia worldwide [2], about 17.2 million pregnant mothers are from Africa [3]. WHO also estimates that anaemia affects over half of the pregnant mothers in developing countries [4]. Anaemia is one of the most common public health problems in developing countries and one of the complication in pregnancy in Sub-Saharan Africa [5]. Recent investigation in three developing countries including Nigeria estimated that the prevalence may be as high as 60.0% anaemia in pregnancy and about 7.0% of pregnant women are said to be severely anaemic [6].

The factors responsible for high prevalence of anaemia in pregnancy are many and their relative contributions are said to vary by environmental area. The causes of anaemia during pregnancy in developing countries are micronutrient deficiencies of folate, iron, Vitamins B12 and A. Also, anaemia may result from parasitic infections such as malaria and hookworm or chronic infections like TB and HIV [7]. These factors that cause anaemia during pregnancy vary due to dietary practice, geographical location and season. In Sub-Saharan Africa like Nigeria, it was reported that inadequate intake of diets rich in iron is the leading cause of anaemia among pregnant women [8]. Anaemia in pregnancy is a disorder that affects mothers and foetuses and it is a known risk factor for many maternal and foetal complications [9]. Anaemia during pregnancy is of great concern because it contributes significantly to increased risk of maternal death during the prenatal period. Anaemia increases pregnancy-induced hypertension, haemorrhage, placenta praevia, and cardiac failure [10]. Overall, 20-40% of the estimated 50 000 maternal deaths worldwide associated with child birth or the postpartum period are attributed to anaemia during pregnancy [11]. Anaemia is also an established risk factor for intrauterine growth retardation, preterm deliveries, low birth weight and prenatal death [12]. The control and management of anaemia in pregnancy is improved by the availability of local prevalence statistics, which is not sufficiently provided in Benue State, Nigeria. Thus, this study aims at providing prevalence statistics of anaemia in pregnancy in relation to demographic factors, socio-economic and underlying medical determinants among pregnant women in the first antenatal care (ANC) clinic visit at St. Mary's Hospital Okpoga, Benue State, Nigeria.

2. METHODOLOGY

2.1 Study Site/Area

This study was conducted at St. Mary's Hospital Okpoga situated in Igwu Okpoga Okpokwu LGA of Benue state, Nigeria. It is a Catholic mission owned hospital established in 1974 by Missionaries from Ireland. The hospital has general Medical Ward, Surgical Ward, Chest Ward, TB Ward, Pediatrics Ward and Maternity Ward. The hospital also has Eye Clinic and ANC clinic, operating theatre, laboratory unit, X-ray unit. NGO supported Programs in the hospital is Centre for Clinical Care Clinic Research (CCCRN) supporting HIV program.

2.2 Study Design and Population

A retrospective analytical study of 858 pregnant women who attended antenatal care between March 2019 to March 2020 at St. Mary's Hospital Okpoga, Okpokwu LGA of Benue State, Nigeria was adopted. Their antenatal case records were retrieved from the records department and the antenatal records unit of the hospital and

analyzed. The study population comprised of all 858 pregnant women who attended ANC at St. Mary's Hospital Okpoga from March 2019 to March 2020 irrespective of age, gestational period, and parity.

2.3 Sample Size Determination

A purposive sampling was selected for the study using their ANC records.

2.4 Sampling Technique/Procedures

A purposive sampling was used for the study, records of all first antenatal care (ANC) clinic visit between March 2019 to March 2020 were considered for the study.

2.5 Data Collection Instructment/Methods

A self developed standard proforma was used for data collection. Data sourced include all records of ANC attendees between March 2019 to March 2020. The proforma has four section A-D. Section A consisting of demographic data,

section B for socio-economic data, Section C for obstetric history while section D consist of ANC attendance/prevalence of anemia in pregnancy at booking by Type, by parity and by degree of malaria parasitaemia .

2.6 Data Analysis

All data extracted from ANC records were entered into Statistical Package of Social Science (SPSS) version 23 and analyzed using frequency tables and percentages.

3. RESULTS

Eight hundred and fifty-eight (858) records of ANC attendees between March 2019 to March 2020 were used in the study. The highest ANC attendees 212 (24.7%) were within the ages of 15-20 years. . Majority of the pregnant women (98.7%) were married. The result shows that (49.7%) of the ANC attendees were housewives and 49.7% of them acquired secondary level of education. Majority 91.5%) of the ANC attendees resided in rural (Table 1).

Table 1. Socio-demographic characteristics of ANC attendees

Variables (N = 858)	Frequency	Percentage (%)
Age (years)		
15-20	212	24.7
21-25	138	16.1
26-30	210	24.5
31-35	166	19.3
36 above	132	15.4
Total	858	100
Marital Status		
Single	9	1.0
Married	847	98.7
Divorced	2	0.2
Widow	0	0
Total	858	100
Occupation		
House wife	426	49.7
Trader	256	29.8
Farmer	58	6.8
Civil servant	52	6.1
Artisan	66	7.7
Total	858	100
Educational qualification		
Primary level	110	12.8
Secondary level	426	49.7
Tertiary level	226	29.8
No formal education	66	7.7
Habitants		
Urban	73	8.5
Rural	785	91.5

Table 2 shows the number of pregnant women at booking in ANC between March 2019 to March 2020 with anaemia cases. It shows that out of 858 ANC attendees, 474 (55.2%) were anaemic.

In this study, majority (62.9%) of the respondents who had primary level of education were anaemic. It was also highest among those with no formal education (84.3%) while those who had secondary level of education (30.4%) had the least prevalence of anaemia. The prevalence of anaemia was highest amongst women who gave their occupation as housewife (59.9%) and least among civil servants. The highest percentage of anaemic cases was between the age of 15-20 years (62.2%) followed by 21–26 years' age group (38.0%) compared to the other age groups. Also, an aggregated average of 55.2 % ANC attendees was anaemic. On the other hand, those residing in rural area had the highest prevalence of anaemia (73.9%).

Table 2. Showing prevalence of anaemia among pregnant mothers in the first antenatal care (ANC) clinic visit between March, 2019 to March, 2020

Month/year	ANC Attendee	Number of anaemia	% of anaemia cases
March, 2019	81	65	80.2%
April, 2019	79	58	73.4%
May, 2019	88	47	53.4%
June, 2019	60	42	70.0%
July, 2019	71	22	40.0%
August, 2019	64	32	50.0%
September, 2019	59	21	35.6%
October, 2019	72	41	35.6%
November, 2019	51	29	56.9%
December, 2019	36	49	62.8%
January, 2020	65	30	46.1%
February, 2020	54	20	37.0%
March, 2020	36	18	56.9%
Total	858	474	55.2%

Table 3. Prevalence of anaemia

Variables (N = 858)		Frequency	Percentage (%)
Age (years)	Anaemic	Non Anaemic	Total
15-20	181(85.4%)	31(14.6%)	212(100%)
21-25	74(53.6%)	64(46.4%)	138(100%)
26-30	107(50.95%)	103(40.05%)	210(100%)
31-35	84(50.60%)	82(49.40%)	166(100%)
36 above	44(33.30%)	88(66.67%)	132(100%)
Total	490(57.1%)	368(42.90%)	858(100%)
Occupation			
House wife	255(59.9)	171(40.1%)	426 (100%)
Trader	148(57.8%)	108(42.2%)	256 (100%)
Farmer	32(55.2%)	26(44.8%)	58 (100%)
Civil servant	13(25%)	39(75.0%)	52 (100%)
Artisan	26(39.4%)	40(60.6%)	66 (100%)
Total	474 (55.24)	384 (44.76)	858(100%)
Educational qualification			
Primary level	69(62.7%)	41(37.3%)	110(100%)
Secondary level	129(30.3%)	297(69.7%)	426(100%)
Tertiary level	88(38.9%)	138(61.1%)	226 (100%)
No formal education	56(84.8%)	10(15.2%)	66 (100%)
Total	342 (39.9%)	486 (56.6%)	858 (100%)
Habitants			
Urban	23(31.5%)	50(68.5%)	73 (100%)
Rural	580(73.9%)	205(26.1%)	785(100%)
Total	603(70.3%)	255 (29.7%)	858(100%)

Table 4. Distribution of anaemia by type

Degree of anaemia	Frequency	Percentage (%)
Severe	0	0
Moderate	351	40.9
Mild	123	14.3
Non anaemic.	384	44.8
Total	858	100

Table 5. Prevalence of anaemia by degree of malaria parasitaemia

Malaria parasites	Anaemic (%)	Non-anaemic (%)	Total
None	135(57.9%)	98(42.1%)	233(100%)
Mild (1+)	125(50.8%)	121(49.2%)	246(100%)
Moderate (2+)	112(45.0%)	137(55.0%)	249(100%)
Severe (3+)	102(78.5%)	28(21.5%)	130(100%)
Total	474(55.2%)	384(44.8%)	858(100%)

Table 5, shows that out of the 858 pregnant women at booking, 50.8% of the women who had mild parasitaemia (1+) were anaemic, while majority 78.5% of those with severe parasitaemia (3+) were anaemic. The study shows that 270 (31.5%) pregnant women booked in their first trimester, 290(33.8%) booked in the second trimester while 298(34.7%) of the pregnant women booked in the third trimester, those who booked in the 3rd trimester was anaemic, (Table 6).

In Table 7, 474 of the pregnant women who attended ANC were multiparous, 314 (66.9%) of them were anaemic. 150 (41.7%) of the 360 primiparous women were anaemic while 10(41.7%) of grandmultipara were anaemic.

4. DISCUSSION

The prevalence of anaemia in pregnancy in the present study was high. 474 (55.2%) were anaemic, it is an indication that anaemia during pregnancy as persists in Nigeria. The prevalence of anaemia found among women in this study could be attributed to low educational status, low nutritional and socio-economic status commonly found among residents of rural areas. It was revealed that anaemia was more prevalence among the pregnant women who booked for ANC in their third trimesters (60%) . The peak of anaemia recorded in this study (3rd trimester) coincides with the period when haemodilution is at its peak. This finding is in agreement with the global database report of WHO [13] in which anaemia is said to be significantly higher in the 3rd trimester of pregnancy than the first two trimesters. Late booking for ANC by pregnant women hinder them from receiving timely health education on diet, malaria prevention and us of heamatinic drugs hence they end up with aneamia.

None of the pregnant women at booking had severe form of anaemia (0.0%). In a similar study done by Glover-Mengor *et al* [14], 36.6% of the women had mild anaemia, 14.1% had moderate and 1% had severe anaemia. This could be linked to the fact that these multiparous women failed to assess family planning and child spacing thereby compromising their diet, livelihood and access to health care leading to anaemia during pregnancy.

The prevalence of of anaemia was highest (78.5%) among pregnant women with severe parasitaemia (3+). This is supported by Obaitan [15], which revealed that malaria infection is estimated to cause 400,000 cases of severe maternal anaemia yearly. This is a major cause of severe anaemia in pregnancy. In high transmission areas, women have gained a level of immunity to malaria that decreases slightly during pregnancy, this is a particular problem for women in their first and second pregnancies and for women who are HIV positive [16].

According to the World Health Organization, a severe public health problem exists if the prevalence of anaemia is equal or greater than 40% in any group, therefore this indicates that anaemia during pregnancy is a major problem in Nigeria. The highest prevalence of anaemia was found in age range of 15-20 years (62.2%) followed by 36 years and above (38.0%) compared to the other age groups. It was also more prevalence among those residing in rural areas (73.9%) than urban dwellers (31.9%). This

Table 6. Prevalence of anaemia by gestational age at booking

Gestational age at booking (Trimester)	Anaemic	Non-anaemic	Total
1st trimester	71 (15 %)	402 (85)	270(100%)
2nd trimester	119 (25 %)	356(75)	290(100%)
3rd trimester	384 60.0%)	189 (40)	298(100%)
Total	474(100 %)	384(100)	858(100)

Table 7. Prevalence of anaemia among pregnant women at booking by parity

Parity	Anaemic	Non-anaemic	Total
Primipara	150(41.7%)	210(58.3%)	360(100%)
Multiipara	314(66.9%)	160(33.8%)	474(100%)
Grandmultipara	10(41.7%)	14(58.3%)	24(100%)
Total	474(55.2%)	384(44.8%)	858(100%)

is in line with findings from a similar study done in Abeokuta Nigeria by Idowu *et al* [17], which also shows the highest prevalence of anaemia (81.5%) among teenage mothers (15-19 years). This could be attributed to possible poor iron reserve in their adolescent years before the occurrence of pregnancy. Those who become pregnant with good haemoglobin level and with good iron stores are more likely to enjoy continued general well-being, such women can tolerate excessive heavy blood loss much better. In addition, they will also go into the postnatal period healthier, better placed to face the challenges of new motherhood, than those who become pregnant while already anaemic or with low iron stores.

Majority (74.2%) of the women who had primary level of education were anaemic, it was highest in those with no formal education (84.3%). Those who had tertiary education had the least prevalence of anaemia (38.5%). This could be explained by the fact that, a limited education result in low literacy, lack of knowledge and awareness regarding health issues. There is no doubt that a person's level of education has a direct bearing on their health seeking behavior. This finding is supported by Anorlu *et al.* [18], in their study on sociodemographic factors in anaemia in pregnancy at booking in Lagos, Nigeria, which states that anaemia is significantly higher among women with no formal education compared to women with formal education. Also women from the low socioeconomic class were significantly more affected by anaemia compared to those in higher socioeconomic class.

Prevalence of anaemia was highest amongst women who gave their occupation as full house wife (59.9%) followed by those who are traders, while those in Civil Service were least anaemic.

Occupation determines income and how much is made available for monthly feeding and consequently nutritional status. This finding agrees with the findings of McClure *et al* [19], a cohort study in coastal Kenya which they observed that pregnant housewives are two times more likely to develop anaemia than who have job. This may be due to financial constraint, work load and late access to health care services.

The study also agrees with findings of Williams [20] in Pumwani Maternity Hospital, Kenya which said that poverty can predispose women to anaemia especially when they lack the money to buy relevant food stuff to eat. The situation is compounded in pregnancy, there is increase demand as maternal nutrients is shared by the fast growing foetus. Poverty cut across many lines of factors predisposing pregnant women to anaemia.

5. CONCLUSION

This study found that there was a strong correlation between parity and prevalence of anaemia. It was more prevalence in multiparous women (53%), those within the age 15-30 years and women who booked for ante-natal after the first trimester. The study also discovered that the prevalence of anaemia among pregnant women attending ANC in St. Mary's Hospital Okpoga was high, this may be due to educational status, occupation, parity (multiparity) and parasitaemia.

6. RECOMMENDATIONS

1. Nurses and Midwives should intensify their health educational intervention to influence mother to book for early ANC services early in the first trimester of pregnancy so

that appropriate intervention measures such as routine intermittent preventive therapy (IPT) for malaria, anthelmintics, iron supplements etc will be initiated to prevent anaemia in pregnancy. Nurses should also ensure that pregnant women should be intermittently screened for the presence of anaemia.

2. Nurses and Midwives should also encourage women to space successive pregnancies by improving the availability and provision of appropriate family planning devices.

3. Girl child education should be strengthened by the government to increase their empowerment financially and will power to access health.

4. Primary Health Care (PHC) services including outreaches, campaigns, mobile clinics should be intensified to reach rural women to access ANC services where they live.

ETHICAL CONSIDERATIONS

Ethical approval was obtained from the ethical committee of Saint Marys Hospital, Okpogam, Diocese, Benue State.

CONSENT

The details of the study were thoroughly explained to all the women in the first antenatal care (ANC) clinic visit.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. WHO. Micronutrient deficiencies: Prevention and control guidelines. WHO, Geneva, Switzerland; 2015.
2. Bull MA, Lichtlman B, Beutler J, Kipps U, Seligsohn K, Pichal JT. Morphology of the erythron, in Williams' haematology. 2016;369–3385.
3. Liyew AM, Tesema GA, Alamneh TS, Worku, MG, Teshale AB, Alem AZ, et al. Prevalence and determinants of anemia among pregnant women in East Africa; A multi-level analysis of recent Demographic and Health Surveys. PloS one. 2001;16(4):e0250560.
4. Omigbodun AO. Recent trends in the management of anaemia in pregnancy. Tropical journal of obstetrics and gynaecology. 2016;21(1):1–3.
5. Buseri FI, Uko EK, Jeremiah ZA, Usanga EA. Prevalence and risk factors of anaemia among pregnant women in Nigeria. Open Journal of Haematology. 2017;l(2):14–19.
6. Kuti O, Komolafe JO, Oni B, Egbewale E. Socio-demographic characteristics of anaemic gravidae at booking: A preliminary study at Llesha, Western Nigeria. Nigerian Journal of Medicine. 2015; 14(2):151–154.
7. Ononge S, Campbell O, Mirembe F. Haemoglobin status and predictors of anaemia among pregnant women in Mpigi, Uganda. BMC research notes. 2016;7(1): 712.
8. Okube OT, Mirie W, Odhiambo E, Sabina W, Habtu M. Prevalence and factors associated with anaemia among pregnant women attending antenatal clinic in the second and third trimesters at pumwani maternity hospital, Kenya. O pen Journal of Obstetrics and Gynecology. 2016;6(01): 16.
9. WHO/United Nations University/UNICEF. Iron deficiency anaemia, assessment, prevention and control: A guide for program managers. WHO, Geneva, Switzerland; 2013.
10. Allen LH, Benoist B, Dary OS, Hurrell R. Guidelines on food fortification with micronutrients. Geneva: World Health Organisation. 2016;3-15.
11. Rahman A, Leppard M, Rashid S, Jahan N, Nasreen HE. 2016. Community perceptions of behaviour change communication interventions of the maternal neonatal and child health programme in rural Bangladesh: an exploratory study. BMC health services research. 2016;16(1):1-13
12. Khan AM, Carducci B, and Bhutta ZA. Low Birth Weight and Small for Gestational Age in the Context of 1,000 Days. In The Biology of the First 1,000 Days. 2017;171-188.
13. WHO. Worldwide prevalence of anaemia: WHO vitamin and mineral nutrition information System *2013–2015*, WHO, Geneva. 2018;11.
14. 14. Glover-Amengor M, Owusu WBA, Kanmori BD. Determinants of Anaemia in

Pregnancy in Sekyere, West District, Ghana. Ghana Med J. 2017;39(3):102–107.

15. Obaitan FO. Anaemia in pregnancy: A paper presented during CME at Asokoro District Hospital, Abuja, Nigeria; 2017.

16. Dim j, Onah R, Adesina O. Prevalence of anaemia among pregnant women at booking in Enugu South Eastern Nigeria; Tropical Journal of Obstetric and Gynaecology. 2017;2(1):50-55.

17. Idowu A, Mafiana C, Dapo S. Anaemia in pregnancy. African health sciences Abeoukuta. 2015;5(4):295-299.

18. Anorlu RI, Oluwole AA, Abudu O. Socio-demographic factors in anaemia in pregnancy at booking in Lagos, Nigeria. Journal of Obstetrics and Gynaecology. 2016;26 (8):773–776.

19. McClure EM, Meshnick SR, Mungai P, Malhotra I, King CL, Goldenberg RL, et al. The association of parasitic infections in pregnancy and maternal and fetal anemia: a cohort study in coastal Kenya. PLoS neglected tropical diseases. 2014;8(2): 2724.

20. Williams O. Laxena therapy in iron deficiency anaemia in pregnancy. Journal of obstetrics and gynaecology. 2015;186 (518):22.