Assessment of anaemia in pregnant women attending antenatal Care in medical facilities within Ekwulobia, Aguata local government area, Anambra state Nigeria

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Abstract

Introduction: Anaemia is one of the public health problems in developing countries. It is an indirect cause of maternal morbidity and mortality.

Objective: The study was carried out to determine the prevalence of anaemia among pregnant women attending antenatal care in Medical Facilities within Ekwulobia, Aguata Local Government Area, Anambra State.

Methods: Two hundred and two pregnant women were purposively selected for the survey. The pregnant women were selected from General hospital, Cynic specialist hospital, Primary Health Centre and St. Victoria specialist hospital all in Ekwulobia. The instruments used for data collection were questionnaire and biochemical analysis. Data were collected on background information, personal data, socio-economic and environmental factors. Blood samples were collected from the antecubital vein to determine the Hemoglobin concentration of the respondents using automated analyzer.

Results: The finding revealed that 36.2% women were anaemic. About 33.7% were mildly anaemic while 2.5% were moderately anaemic. The result revealed 43.3%, 34.8% and 28.8% of pregnant women in their 1st, 2nd, and 3rd trimester respectively had their hemoglobin concentration less than 11 g/dl (mild anaemia). About 3.3% and 2.5% of pregnant women in their 2nd and 3rd trimesters respectively had moderate anaemia (less than 9 g/dl). There was a relationship (p<0.05) between the women's haemoglobin concentration and education (p=0.008), occupation (p=0.027) and birth spacing (p=0.036).

Conclusion: The prevalence of anaemia in the pregnant women was high indicating a public health problem.

Keywords: Anaemia, Pregnant women, Prevalence, Aguata L.G.A, Anambra state, Nigeria

Introduction

Anaemia is defined as a reduction in the red cell mass in the blood resulting in a drop in oxygen supply to meet the metabolic needs of the body [1]. Anaemia in pregnancy continues to be a global problem associated with increased maternal morbidity and mortality particularly in developing countries such as Nigeria [2]. It is a disorder of great public health importance in poor countries especially in Sub-Saharan Africa. Pregnant women and young children especially preschool age group are the most vulnerable [3]. Anaemia affects over half of the pregnant women in developing countries [4]. Estimates in developing countries including Nigeria put the prevalence at 60.0% in pregnant woman and about 7.0% are said to be severely anaemia [5]. Some 20% of maternal death in Africa and 11% in Nigeria have been attributed to anemia [6]. Anaemia has social and demographic implications [7]. Anaemia in pregnancy is a very common medical disorder, with significant implications for both mother and child [8]. Its primary cause is iron deficiency, but also occurs due to other causes like parasitic infection, malaria in endemic tropical countries of Africa, nutritional deficiencies and hemoglobinopathies and recently human immunodeficiency virus infection [3,9]. There is a high level of ignorance and cultural beliefs about anemia in pregnancy, as well as its prevention and treatment in our environment [10]. Pregnancy age, grandmultiparity, low socioeconomic class and poor maternal education are some of the factors associated with maternal anaemia in some Nigerian studies [11,12]. An important factor that is common in the tropics but is often overlooked is socio-economic deprivation. This has been linked with the development, severity and outcome of many medical conditions [7]. Poverty and low standards of living are still major problems facing most developing countries. Regardless of the huge deposits of mineral resources, Nigeria still ranks the 13th poorest country in the world with about 72% of the country's population living below the poverty line (World Bank, 2006). The ability of women to command resources and make independent decisions about their fertility, their health and health care also has an impact on maternal anaemia. Appropriate prenatal interventions like iron supplementation helps in reducing the prevalence [13].

Specific objectives

(i) Assess the prevalence of anaemia among pregnant women.

(ii) Identify the factors that could predispose the pregnant women to anaemia.

(iii) Assess the relationship between anaemia and the socioeconomic variables observed in the women.

Materials and Methods

Study design

A cross-sectional survey was used for this study.

Area of study

The study was conducted in Ekwulobia, in Aguata Local Government Area, Anambra State. Ekwulobia is the headquarter of Aguata L.G.A. The town is located within latitude 6.33°N and longitude 7.08°E. Ekwulobia has a population of 500,000 people [14]. The inhabitants are predominantly farmers, traders, civil servants, students, merchants, who are typically Igbos, and few inhabitants from other tribes like Yoruba, Hausa, and Cross River. Ekwulobia town is made up of nine villages; Okpo, Ula, Umuchiana, Umuchi, Ihuokpala, Eziagulu, Agba, Abogwume and Nkonu.

Population of the study

The study population comprised of pregnant women attending antenatal care in Ekwulobia.

Sampling and sampling techniques

The sample size (N) was determined by the equation below:

The sample size $(N) = \dfrac{Z^2 \times P(100\text{-}P)}{X^2}$

Z=an acceptable margin of error of 1.96 at 95% confidence interval would be used and approximated to 2.

P=Percentage of maternal mortality in pregnancy as a result of anaemia in Nigeria is 11% (United Nation Population Fund, 2015).

100 – P=Percentage of pregnant woman that did not die as a result of anaemia.

X=width of confidence interval or required precision level taken to be 5%

=4x39.16=154.64 =4x39.16=154.64 .

The sample size was increased to two hundred and two to make up for attrition.

Sampling procedure

There are eight hospitals and one primary health centre in Ekwulobia. From the nine Facilities, four medical facilities were selected using simple random sampling method by balloting. The selected medical facilities included General hospital Ekwulobia, Cynvic specialist hospital and maternity, Primary Health Centre Ekwulobia and St. Victoria specialist hospital and maternity. The pregnant women registered in the four medical facilities were selected using purposive sampling technique.

Preliminary Activities

Preliminary visit

Prior to the survey, a preliminary visit was made to the medical facilities to inform them on the importance of the survey. Permission was also sought to allow the researchers carry out data collection

Training of research assistant

Three research assistants were trained to assist the researcher on data collection. The purpose and objectives of the study were communicated and clearly explained to them.

Ethical approval

Ethical approval was obtained from the Ethical Committee of the Medical Facilities before the study commenced. The respondents were requested to fill informed consent forms, for their approval of blood collection for the research.

Data Collection

Questionnaire administration

A validated and pretested questionnaire was used to collect information on background information, personal data, socio-economic status and environmental factors.

Background information

Age, religion, marital status, number of pregnancies and number of children.

Socio-economic status and environmental factors

These include educational level, occupation, monthly income, type of family and number of people in the household, foods forbidden in the area for pregnant women.

Collection of blood samples

From each of the recruited women, 5 milliliters of venous blood was collected from the antecubital vein, using plastic disposable syringes into plastic bottles containing ethylene di-amine-tetra acetic acid (EDTA).

Biochemical assessment

Two capillary tubes labeled for each subject were filled with blood for about 2/3 of the length of each tube. This was to ensure that an average of the two values obtained was used for calculation. Several labeled samples were assembled in the centrifuge (haematocrit machine). Haemoglobin concentrations were determined using automated analyzer. Haemoglobin less than 11.0 g/dl during pregnancy was regarded as anaemia by World Health Organization [7].

Data and Statistical Analysis

Haemoglobin concentration below 11.0 g/dl during pregnancy was regarded as anaemia. Data were analyzed using Statistical Package for Social Sciences (SPSS version 20.0). Statistical data was expressed as frequency and percentages. Pearson's correlation between the variables was computed and Chi square was also used to determine the significance between the variables.

Results

Background information of the pregnant women

Table 1 shows the background information of respondents. About 27.7% of the women were between 20-24 years, 33.2% were between 25-29 years and 23.3% were 30-34 years. Only a few (1.5%) were above 40 years. Majority of the women (92.1%) were married. All the women were Christians (100%). Most of the women (94.1%) were Igbo.

Personal data of the pregnant women

Table 2 shows the personal information of the pregnant women. About 45.5% of the women were in their second trimester

Table 1. Background information of the pregnant women.

Variables	Frequency	Percentage
Age (years)		
15-19	7	3.5
20-24	56	27.7
25-29	67	33.2
30-34	47	23.3
35-40	22	10.9
Above 40	3	1.5
Total	**202**	**100**
Marital status		
Married	186	92.1
Single	11	5.4
Divorced	1	0.5
Widowed	2	1.0
Others	2	1.0
Total	**202**	**100**
Religion		
Christian	202	100
Ethnic group		
Yoruba	0	0
Hausa	1	0.5
Igbo	190	94.1
Others	11	5.4
Total	**202**	**100**

Table 2. Personal data of the pregnant women.

Variables	Frequency	Percentage
Stage of pregnancy		
1-3 months (1st trimester)	30	14.9
4-6 months (2nd trimester)	92	45.5
7-9 months (3rd trimester)	80	39.6
Total	**202**	**100**
Number of pregnancy		
Two	51	25.2
Three	37	18.3
Four	12	5.9
Five and above	21	10.4
First pregnancy	81	40.1
Total	**202**	**100**
Had miscarriage		
Yes	30	14.9
No	172	85.1
Total	**202**	**100**
Number of children		
01-Feb	77	38.1
03-Apr	27	13.4
05-Jun	17	8.4
None	81	40.1
Total	**202**	**100**

while 39.6% were in their third trimester. Only 14.9% were in their first trimester. More than half (59.9%) of the women were multigravida, while 40.1% were primigravida. For the multigravida, 14.9% of them have had miscarriage. About 38.1% of the pregnant women had one to two children, 13.4% had three to four children. Only a few (8.4%) had five to six children

Socio-economic status of the pregnant women

Table 3 shows the socio-economic status of the pregnant women. More than half of the women (54.5%) completed their secondary education, 28.2% completed their tertiary education. Only 4% had no formal education. About 23.3% of the pregnant women were traders, 22.3% were business women, while 16.3% were civil servants. About 48% of the women earned 5,000-10,000 naira per month, 24.8% earned less than 5,000 naira per month. Only a few women (2.0%) earned 70,000 naira and above.

Foods forbidden during pregnancy in the study area

Table 4 shows various foods forbidden in the study area. About 54.0% of the pregnant women claimed some foods were

Table 3. Socio-economic status of the pregnant women.

Variables	Frequency	Percentage
Level of education		
None	1	4.0
Primary School	20	9.9
Secondary School	110	54.5
Tertiary School	57	28.2
others	7	3.5
Total	**202**	**100**
Occupation		
Students	28	13.9
Civil servant	33	16.3
Teaching	44	21.8
Trading	47	23.3
Business	45	22.3
Not Employed	4	2.0
other	1	0.5
Total	**202**	**100**
Monthly income		
Less than ₦5000	50	24.8
₦5000-₦10000	97	48.0
₦10000-₦30000	30	14.9
₦30000-₦69000	21	10.4
₦70000 and above	4	2.0
Total	**202**	**100**

Table 4. Foods forbidden during pregnancy in the study area.

Variable	Frequency	Percentage
Foods forbidden		
Egg	14	6.9
Liver	12	5.9
Kidney	14	6.9
Red meat	9	4.5
Dark green vegetable	9	4.5
Cray fish	7	3.5
Periwinkle	15	7.4
Mackerel	9	4.5
Cowpea	7	3.5
Snail	13	6.4
None	93	46.0
Total	**202**	**100**

forbidden in their area during pregnancy egg was forbidden by 6.9% of the respondents, liver 5.9%, kidney 6.9% , red meat 4.5%, dark green vegetable 4.5%, crayfish 3.5%, periwinkle 7.4%, mackerel 4.5%, cowpea 3.5% and snail by 6.4% of respondents.

Prevalence of anaemia among pregnant women

Table 5 shows the prevalence of anaemia among the pregnant women. About 33.7% of the women had moderate anaemia while 2.5% had mild anaemia. None of the women had severe anaemia.

Prevalence of anaemia among pregnant women by trimesters

Table 6 shows the prevalence of anaemia among the pregnant women according to their different trimesters. About 43.3% of

women in their first trimester had mild anaemia. None of the women in their first trimester had moderate or severe anaemia. For women in their second trimester, 34.8% had mild anaemia, 3.3% had moderate anaemia. For women in their third trimester, 28.8% had mild anaemia while 2.5% had moderate anaemia. There was no significant relationship (p>0.05) between pregnancy age and anaemia.

Relationship between anaemia and socioeconomic variables

Table 7 shows the relationship between hemoglobin concentration and socioeconomic characteristics of the women. From the result, there was a significant relationship (x^2=20.206; p=0.008) between education and hemoglobin concentration. There was also a significant relationship between occupation and haemoglobin level (x^2=20.846; p=0.027) of the women.

Discussion

Most of the respondents were between 20-34 years. Only a few (3.5%) were 15-19 years. This shows that adolescence and early pregnancy is in decline [15]. Majority of the women (92.1%) were married, this could be as a result of religions practices in the area that does not encourage child birth out of wedlock [15]. All the women were Christians (100%) this is not strange because almost all the respondents were from Igbo tribe and Christianity is the main religion practiced in South

Table 5. Prevalence of anaemia among pregnant women.

Biochemical assessment	Frequency	Percentage
Haemoglobin		
13-14.99 (High normal)	12	5.9
11-12.99 (normal)	117	57.9
9-10.99 (mild anaemia)	68	33.7
7-8.99 (moderate anaemia)	5	2.5
<7 (Severe)	0	0
Total	**202**	**100**

Table 6. Prevalence of anaemia among pregnant women by trimesters.

Indicator	1-3 months (1st trimester) NO%	4-6 months (2nd trimester) NO%	7-9 months (3rd trimester) NO%	Total prevalence NO%	p-value
Haemoglobin (g/dl)					
High normal (13-14.99)	2 (6.7)	4 (4.3)	6 (7.5)	12 (5.9)	0.725
Normal (11-12.99)	15 (50.0)	53 (57.6)	49 (61.2)	117 (57.9)	
Mild (9-10.99)	13 (43.3)	32 (34.8)	23 (28.8)	68 (33.7)	
Moderate (7.00-8.99)	0 (0.0)	3 (3.3)	2 (2.5)	5 (2.5)	
Severe anaemia (<7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
Total	30 (100)	92 (100)	80 (100)	202 (100)	

Table 7. Relationship between anaemia and socioeconomic variables.

Variables	Normal NO	%	Anaemia Mild NO	%	Moderate NO	%	Total NO	%	P-value
Education									
None	3	2.6	3	4.4	0	0.0	0.0	4.0	**0.008**
Primary	12	10.3	5	7.4	2	0.0	0.0	9.9	
Secondary	63	53.	37	54.4	2	16.7	107	53.0	
Tertiary	34	29.	18	26.5	0	0.0	55	27.2	
Others	2	1.7	5	7.4	1	20.0	12	6.0	
Total	**117**	**100**	**68**	**100**	**5**	**100**	**202**	**100**	
Occupation									
Students	19	16.	9	13.	0	0.0	28	13.9	
Civil servant	26	22.	4	5.9	0	00	33	16.3	
Teaching	24	20.	15	22.	1	20.0	44	21.8	
Trading	26	22.	17	25.	2	40.0	47	23.3	**0.027**
Business	21	17.	19	27.	2	40.0	45	22.3	
Not Employed	1	0.9	3	4.4	0	0.0	4	2.0	
Others	0	0.0	1	1.5	0	0.0	1	0.5	
Total Income	**117**	**100**	**68**	**100**	**5**	**100**	**202**	**100**	
<₦5000	27	23.1	18	26.7	1	20.0	50	24.8	
₦5000-N10000	52	44.4	34	50.0	4	80.0	97	48.0	0.319
₦10000-N30000	21	17.9	9	13.2	0	0	30	14.9	
₦30000-N69000	13	11.1	7	10.3	0	0.0	21	10.4	
₦70000 and above	4	3.4	0	0.0	0	0.0	4	2.0	
Total	**117**	**100**	**68**	**100**	**5**	**100**	**202**	**100**	

East [15]. Majority of the women were in their second (45.5%) and third (39.6%) trimesters. It has been observed that women do not start attending antenatal care immediately they become pregnant, some would continue to wait until they fall sick before they register for antenatal [6]. More than half (59.9%) of the pregnant women were multigravida. This could be attributed to lack of family planning method. In Nigeria, some cultures and traditions prohibit women from accepting and practicing family planning, thus giving rise to multiparity and inter pregnancy, hence causing large family size, depleting maternal iron store and consequent nutrition inadequacy [16]. More than half of the women (54.5%) had completed only secondary education. The low income earnings observed in the respondents maybe as a result of the low educational status of the women in the study area. This result is similar to the study of Idowu et al. (2005) where it was observed that the monthly income of pregnant women was low [6]. More than half of the respondents (54.0%) claimed some foods were forbidden in their places during pregnancy. These foods were forbidden as a result of traditional and superstitious believe. Inadequate consumption of foods could predispose them to nutritional deficiencies especially anaemia. Diverse cultural practices restricting the consumption of foods high in iron could affect the haemoglobin level of women during pregnancy. The finding revealed that 36.2% women were anaemic. This result is closely related to the research of Ikeanyi and Ibrahim (2015) that reported the prevalence of anaemia to be 32.2% [17]. This result is lower when compared with the research conducted by Idowu et al. (2005) they reported the prevalence of anaemia among pregnant women in their study to be 76.5% [17]. This prevalence of anaemia observed in in the study area may be related to short birth spacing, low educational level and occupations of pregnant women in the study area. Anaemia was observed at the different trimesters of pregnancy and this could be as a result of inadequate intake of foods rich in iron leading to a reduction in the iron stores of the women. In pregnancy, there is plasma volume expansion which begins to increase during the first week of conception, and continue to expand at a relatively rapid rate, causing dilution of the red blood cells (haemodilution). Pregnancy increases the demand for folic acid, and therefore poses the risk of iron deficiency anaemia. There was a significant relationship (x^2=20.206; p=0.008) between education and hemoglobin concentration. This shows that the proportion of anaemic women increased with decrease level of education. Lack of education reduces women's access to economic opportunities such as employment, thus affecting her learning capacity and difficulty to afford adequate nutrition. Illiteracy hinders her acceptance and practice of perinatal care advice and knowledge of proper nutrition, as well as methods of food preparation [3,18]. There was significant relationship between occupation and their haemoglobin level (x^2=20.846; p=0.027). Majority of the women were traders and business women, this might have taken much of their time and energy thus depriving the women from eating adequately.

Conclusion

The prevalence of anaemia in the pregnant women was high indicating a public health problem. Anaemia in pregnancy especially in Nigeria continues to be a public health problem associated with increased maternal morbidity and mortality.

The study also observed that some socio economic factors such as occupation and education affected the haemoglobin concentration of the pregnant women. Diverse cultural practices (food taboos) restricting the consumption of foods high in iron ma have affected the haemoglobin level of women during pregnancy.

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