Prevalence of Anaemia at Booking amongst Antenatal Clinic Attendees in Some Health Facilities in Ogoni, South-South 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.

Original Research Article

ABSTRACT

Background: Anaemia in pregnancy is an indirect cause of maternal mortality. Myriad of factors predispose pregnant women to anaemia in pregnancy in the developing countries of the world of which poverty, illiteracy and ignorance are central. The prevalence of anaemia in the developing countries of the world is between 32% and 62.2%.
Objective: To determine the prevalence of anaemia amongst antenatal clinic attendees in Ogoni, South-South Nigeria and offer preventive measures.
Material and Methods: This was a retrospective four months cross-sectional study of antenatal clinic attendees at booking in three (3) primary health care facilities and general hospitals Bori and Tera, in Ogoni, South-South Nigeria. Three hundred and eighty (380) pregnant women's biodata including their packed cell volume were collected. These pieces of information were computed using a structured proforma. The data were coded and analysed using statistical package for social sciences (SPSS) software version 25.

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Results: The mean age of the study antenatal clinic attendees was 28 years. The mean gestational age at booking was 25weeks. The range for the packed cell volume was 25% to 36% and the mean packed cell volume at booking was 30%. Three hundred and eighteen (318) (84.0%) had anaemia (with packed cell volume less than 33%). Majority of patients 249 (65.6%) had mild anaemia There was none with severe anaemia. Majority of patients had secondary level of education represented by 275 (72.3%).

Conclusion: The prevalence of anaemia amongst antenatal clinic attendees at Ogoni was 84.0%. The role of pre-pregnancy care amongst women desirous of pregnancy, familly planning and the role of education cannot be over emphasized in the prevention of anaemia in pregnancy.

1. INTRODUCTION

Anaemia is an indirect cause of maternal mortality and a predisposing factor to post-partum haemorrhage which is a major cause of maternal mortality [1]. The World Health Organization (WHO) defines anaemia as haemoglobin concentration less than 13 g/dl for men and 12 g/dl for women.[1-3]The burden of anaemia in pregnancy is more in the developing countries of the world [2]. The prevalence of anaemia during pregnancy by researchers to be in the range of 32% to 62.2% [3]. In addition women who had secondary or higher level of education were less likely to have anaemia in pregnancy when compared with those with primary or no formal education [4-6]. Globally, fifty percent of pregnant women are anaemic [4-6]. Although in the developed countries of the world fifteen percent of pregnant women are anaemic [4].

Anaemia in pregnancy is caused by some aetiological factors such as – iron deficiency which is one of the most common cause resulting from shortage of vitamins such B-complex and also folic acid. Other causes include anaemia associated with bone marrow disease and sickle cell disease(SCD) [1,4-6]. In addition, there are myriad of aetiological factors of anaemia in pregnancy such as an increase in red blood cell corpuscular loss as in obstetric haemorrhages or decreased erythrocytic products example of which are nutritional deficiency or chronic disease exemplified by renal disease, malignancies co-existing with pregnancies [7]. Further more, anaemia in pregnancy could be as a result of red blood cell destruction as in SCD and malaria [8].

There a are myriad of factors that contribute to anaemia in pregnancy which may be explained by three key factors: poverty, health illiteracy and lack of health education [3].

Anaemia in pregnancy affects both the mother and the developing fetus [4]. Its adverse effects depend on the severity [5]. In addition, anaemia in pregnancy predisposes the pregnant woman to maternal death especially in severe cases. Miscarriages, prematurity and low birth weight are adverse effects on anaemia to the developing fetus [6,9]. Insufficient transportation of oxygen to the fetus when the pregnant mother is anaemic resulting in low birth weight [3-4].

In sub-Saharan Africa anaemia in pregnancy is responsible for approximately one-fifth of maternal mortality [1-3]. In addition, pregnant women with anaemia are susceptible to infections as a result of reduced resistance to disease and with severe anaemia in pregnancy the parturient is at risk of intra-partum or post-partum haemorrhage [10-12]. Literature from WHO has revealed the proportion of maternal death from anaemia as follows Nigeria (9%) Malawi (8%) India (16%) and Kenya (11%) [1-6]. In developing countries of the world anaemia affects over 60% of pregnant women and approximately half of non-gravid women [4-6] Patients with severe anaemia are at risk of contracting blood borne infections such as HIV/AIDS, Hepatitis just to mention a few through blood transfusion [9-10].

Anaemia no matter the severity whether mild or moderate is associated with tiredness, weakness and reduction in work productivity [11]. Furthermore, anaemia in pregnancy results in reduction of oxygen delivery to the placenta and therefore to the fetus resulting in intra-uterine growth restriction, low-birth weight prematurity and stillbirth [12]. Infants delivered to pregnant women with anaemia have low iron stores and are at risk of morbidities such as anaemic heart failure, sepsis and neonatal mortalities [13].

Anaemia in pregnancy could also be classified based on morphology of the red blood cells, example of which are microcytic, macroytic or

normocytic anaemia as in iron deficiency, folic deficiency or non-micronutrient anaemia [14]. Furthermore, anaemia can be classified as hypochromic of which iron deficiency is example [8,14].

Literature has revealed that in sub-Saharan Africa anaemia could be as a result of infections and infestations of helminthics and protozoas such as hook worm or malaria which accounts for approximately three quarters of anaemia in pregnancy [8,14]. Anaemia in pregnancy is associated with environment, social and biological factors such as high parity, low socio-economic status, failure to space children, malaria, haemoglobinopathies and HIV infections [12,11,8,14]. Other contributory factors to anaemia in pregnancy are illiteracy, ignorance, taboos with respect to food consumption [7,8].

Research has shown that the prevention of anaemia in pregnancy is realistic and cost-effective [12,11,8,14]. Addressing the above aetiological factors of anaemia in pregnancy is key to the prevention of anaemia in pregnancy [15]. The prevention of anaemia in pregnancy is centred on health education, family planning and poverty alleviation [16,15].

2. AIM AND OBJECTIVE

To determine prevalence of anaemia amongst antenatal clinic attendees in Ogoni, south-south, Nigeria and offer preventive measures to those that are booking for antenatal care.

3. MATERIALS AND METHODS

This was a retrospective four months cross-sectional study of antenatal clinic attendees at booking in (3) three primary health care facilities(Gokana, Khana, Tai Local Government Area, General Hospitals Bori and Tera) in Ogoni, South-South Nigeria. Three hundred and eighty pregnant women's biodata including their packed cell volume at booking were collected. These pieces of information were computed using a structured proforma. The data were coded and analysed using statistical package for social sciences (SPSS) software version 25.

3.1 Materials

3.1.1 Sample size estimation

The sample size of 380 was calculated using the Kish Leslie formula for cross-sectional studies

calculated, based on 55% prevalence of anaemia in pregnancy from the study by Olatunbosun OA et al. [2] at the University of Uyo Teaching Hospital Uyo, Nigeria and a confidence level of 95%.

$$n= Z^2Pq/d^2$$

Where

n is the desired sample size

Z is the standard normal deviate usually set at 1.96, which corresponds to the confidence interval

P is the proportion of pregnant women with anaemia which in this case is 55%

q is complementary proportion equivalent to one (1), that is 1- 0.55% equal to 0.45%

d is the degree of accuracy desired which is 5.0% (0.05%)

$n= 1.96^2$ x 0.55 (1- 0.55)/0.05^2

= 380.3

This was rounded up to the nearest whole number, the reason for using 380 as the sample size.

3.1.2 Study population

This is a distinct ethnic nationality and part of the Ijaw ethnic group within the Federal Republic of Nigeria. The population of Ogoni is over 1 million with Local Government head quaters in Bori occupying 1000 km² [15]. The languages of the Ogoni people are Khana, Gokana, Eleme, Tae. The religion of the Ogonis are traditional beliefs and Christianity [15].

The study population comprised 380 consecutive pregnant women with or without clinical symptoms of anaemia, who presented for booking at these hospitals and were recruited for this study.

3.2 Methods

Antenatal clinic attendees eligible for the study were given structured interviewer-administered questionnaire. The content of the questionnaire were bio-data, socio-demographic characteristics and information on current and previous pregnancies.

Packed cell volume (PCV) was determined by collecting two millilitres (2mls) of venous blood. This was collected from the ante cubital vein using plastic disposable bottles for each of the subjects. The sample bottles contain ethylene diamine-tetra acetic acid (EDTA).

3.3 Packed Cell Volume Estimation

The packed cell volume were obtained using a hematology auto analyser.

3.3.1 Inclusion criteria

- ❖ Women that gave informed consent
- ❖ Women in their booking ante natal visit
- ❖ Healthy patients with singleton pregnancy

3.3.2 Exclusion criteria

- ❖ Women who did not consent to the study
- ❖ Patients with multiple gestation
- ❖ Patients with sickle cell disease and haemophilia
- ❖ Patients with vaginal bleeding in the current pregnancy

3.4 Data Analysis

The data were coded and analysed by using the Statistical Package For Social Sciences (SPSS) software version 25. There was cross-tabulation of various variables against PCV. Proportions were compared using the Chi-square test. P value <0.05 was considered significant.

4. RESULTS

The mean age of the study antenatal clinic attendees was 28 yearsThe mean gestational age at booking was 25 weeks. The range for the packed cell volume was 25% to 36% and the mean packed cell volume at booking was 30%. Three hundred and eighteen (84%) ante natal clinic attendees had anaemia in pregnancy at booking (packed cell volume less than 33%). Majority had mild anaemia 270 (71.0%). There was none with severe anaemia. Majority had secondary level of education represented by 275 (72.3%). For parity distribution of the ante natal clinic attendants at booking 59 (15.5%) were primigravida, 110 (29%) were primiparas, 208 (54.7%) were multiparas and 3 (0.8%) were grand multiparas. The mean packed cell volume for women at booking was 29%. Three hundred and eighteen (84%) of the study population had anaemia (packed cell volume <33%) at booking of which 71.1% had mild anaemia and 12.4% had moderate anaemia,

5. DISCUSSION

The study revealed the prevalence of anaemia amongst antenatal clinic attendees at booking in three primary health care centres and two general hospitals in Ogoni as 84.0%. Most of the attendees had mild anaemia 71.1%, this is shown in Table 1. These values are higher than values from other parts of Nigeria [1-4]. However, when compared to low incidence of anaemia in pregnancy recorded in Enugu Nigeria the cut-off for anaemia was haemoglobin concentration less than 10g/dl or packed cell volume (PCV) less than 30% compared with this study with cut-off point for anaemia was 11g/dl or PCV less than 33% [1-6,9,10]. Majority of the ante natal clinic attendees had secondary level of education represented by 67% of the subjects as shown by the bar chart above. This was not in agreement with a study done in Western Nigeria where majority of the subjects had tertiary level of Education [2]. However, in studies done at Northern Nigeria a good proportion of the study population had primary level or no formal education with high prevalence of anaemia in pregnancy [10]. Women who had secondary or higher level of education were less likely to have anaemia in pregnancy when compared with those with primary or no formal education [4-6].

In this study, there was no case of severe anaemia of pregnancy (PCV<21%) when compared with some other studies that recorded prevalence of severe anaemia as 0.7% and 3.6% in Sagamu and Southern Nigeria respectively [1,2]. The possible measures why there was no case of severe anaemia may be due to occasional distribution of free haematinics and anti-malaria medications by the government agencies and non-governmental organizations [1,11-13,7,8]. In addition, health consciousness campaigns in mass media and non-profit organization on the need to be compliant with ante natal visits and medications, also contributed [2-4].

In addition some of these pregnant women visited major urban cities where they have relatives to attend antenatal care and have access to haematinics [1-3,14-17]. Furthermore, some studies have revealed that some women place themselves on haematinics.

Prevalence of anaemia in pregnancy is high in this study because of a good number of reasons. These include the cut-off point for anaemia was packed cell volume less than 33% or concentration less than 11gldl which is the world health organization (WHO) cut-off for anaemia [2]. In addition, in the Ogoni axis of Southern-Nigeria due to poverty, illiteracy and ignorance

[1-6,9-11]. Literature have shown that poor nutrition is a recognized cause of iron deficiency anaemia [1,2-4,12,137,8,16]. Furthermore, in these communities where farming was a means of livelihood but with the degradation of the community due to oil spillage their land is not good enough for farming [7,8].

The study revealed the mean gestational age at booking as 25weeks as compared to some other communities in Nigeria where mean gestational ages range between 18 and 20weeks [1,2] These women were not on routine haematinics and did not have malaria prophylaxis prior to booking and their pregnancies were not supervised, hence making them more predisposed to anaemia in pregnancy [2-4].

The study also revealed difference in the packed cell volume when compared with the educational status of the women. All the seven (1.8%) women with no formal education had anaemia when compared with fifteen (3.9%) of those with tertiary education anaemia as shown in Tables 3 and 4, It is important to note that majority of the anaemia in pregnancy were among those with primary and secondary levels of education 92% and 98% respectively. This was shown in Table 3 and is in keeping with studies elsewhere [1-4]

Table 1. The relationship between parity and anaemia

Parity	Frequency	Anaemia (< 33%)	Moderate anaemia (PCV 20-29%)	Mild anaemia (30-32%)
Primigravida	59 (15.5%)	60 (16%)	0%	118 (31.1%)
Primipara	110 (29%)	80 (21%)	0%	152 (40%)
Multipara	208 (54.7%)	176 (46.5%)	47 (12.4%)	0%
Grandmultipara	3 (0.8%)	2 (0.5%)	2 (0.5%)	0%
Total	380 (100%)	318 (84%)	49(12.9%)	278 (71.1%)

Table 2. Distribution of educational status of ante natal clinic attendees

Primary – 50 (13%)
Secondary – 255 (67%)
Tertiary – 68 (18%)
No formal education – 7 (2%)
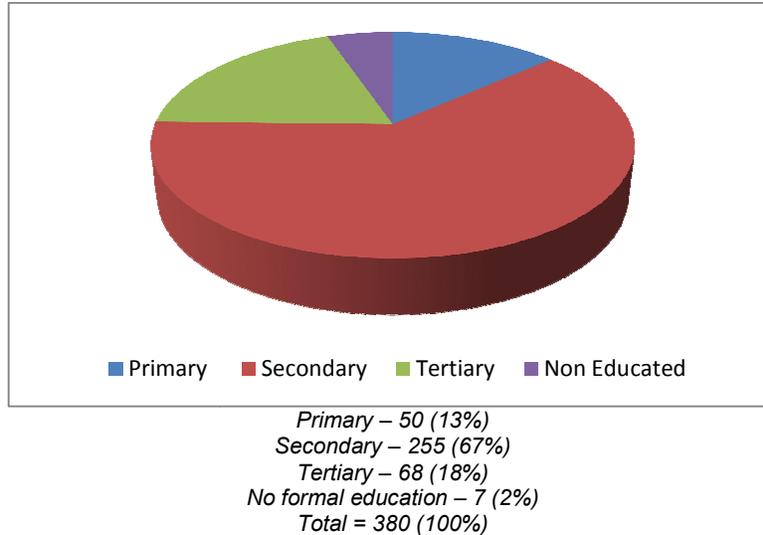*Total = 380 (100%)*

Table 3. Comparison between the level of education and anaemia of ante natal clinic attendees in Ogoni, southern Nigeria

Level of education	Frequency (%)	Anaemia
No formal education	7 (2.2%)	7 (1.8%)
Primary	50 (13%)	46 (12.2%)
Secondary	255 (67%)	250 (66.1%)
Tertiary	68 (21,4%)	15 (3.9%)
Total	380 (100%)	318 (84%)

Table 4. Relationship between anaemia and educational status of antenatal clinic attendees at booking

+	Number of cases	Number of anaemia cases	% Anaemia
No education	7	7	100
Primary	50	46	92
Secondary	255	250	98
Tertiary	68	15	22

The table shows non tertiary education is associated with anaemia in pregnancy.

6. CONCLUSION

In Ogoni axis of Rivers State, South-South Nigeria, anaemia in pregnancy s prevalent. The factors contributing to significant anaemia in pregnancy prior to booking as include late booking, lack of formal education. The role of health education, public enlightenment family planning and pre-pregnancy care cannot be over-emphasized. In addition, advocacy should be made for early booking at clinic so that the anaemia prevention can be initiated early: haematinics, Intermittent Preventive Therapy (IPT), increased protein intake. Basic education and community health education to include causes of anaemia and its prevention and treatment.

CONSENT AND ETHICAL APPROVAL

As per international standard or university standard guideline participant consent and ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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