PREVALENCE OF ANAEMIA IN RURAL WOMEN AT REGISTRATION FOR ANTENATAL CARE IN A SPECIALIST TEACHING HOSPITAL IN IRRUA, EDO STATE.

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ABSTRACT:

Background

Anaemia continues to be a major cause of morbidity amongst pregnant women with attendant consequences. Rural women are likely to be more predisposed to anaemia in pregnancy than their urban counterparts as a result of lower socio-economic environment prevalent in the rural areas. This study was carried out to determine the prevalence of anaemia in pregnant women within a rural environment prior to antenatal care.

Objective

To determine the prevalence of anaemia and factors that influence aneamia in pregnancy in rural women prior to commencing antenatal care.

Materials and Methods

This is a descriptive study of pregnant women at the antenatal registration visit at Irrua Specialist Hospital in 2012. Three hundred and eighty pregnant women were randomly selected and their packed cell volume (PCV) determined at presentation for antenatal care. Biomedical data was collected at presentation using a structured questionnaire. Data was collated and analyzed with Statistical Package for Social Sciences (SPSS) software Version 17 and presented as percentages, proportions and cross tabulations.

Findings

The mean age of the studied population was 30.2 ± 5.2 years. The mean gestational age at booking was 16.5 ± 7.6 weeks. The mean packed cell volume for the women at booking was 33.9 ± 3.1%. However, one hundred and thirty two (34.7%) of three hundred and eighty women were anaemic (packed cell volume < 33%) though majority (29.2%) had mild anaemia. There was none with severe anaemia. Lack of education, increasing parity and reduced interval from last pregnancy are factors associated with anaemia in these rural women.

Conclusion/Recommendations

Anaemia is prevalent in the rural Irrua women at booking. High parity, low level of education and use of heamatinics prior to booking all associated with the occurrence of anaemia in pregnancy in these women. The study suggested that anaemia may predate the pregnancy in the majority of cases. Preconception care should be encouraged which will include, educating mothers on anaemia and family planning. This, accompanied by iron and folic acid supplementation as well as antimalarial prophylaxis will strongly reduce this prevalence of anaemia in pregnancy.

KEYWORDS: anaemia in pregnancy, rural women, booking visit,
RUNNING TITLE: Anaemia in Rural Pregnant Women

INTRODUCTION:

Anaemia is defined by the world health organization as a haemoglobin concentration below 11g/dl.[1] It is a condition in which the number of red blood cells or the oxygen carrying capacity of the red blood cells is insufficient to meet physiologic needs. It is a major health problem in many developing countries especially in sub- Saharan Africa and South East Asia were poverty, ignorance and disease are still very prevalent amongst the people. Anaemia in pregnancy is associated with increased rates of maternal and perinatal mortality, premature deliveries, low birth weight and other negative outcomes.[2, 3] More than half of the pregnant women in the world have haemoglobin (Hb) levels indicative of anaemia. Although only about 15% of pregnant women are anaemic in developed countries, the prevalence of

anaemia is relatively high (33%-75%) in the developing countries.[1-8]

It is estimated that anaemia may be responsible for as much as 20% of all maternal deaths in sub Saharan Africa. Anaemia makes women more susceptible to death from haemorrhage, by lowering their haematologic reserve for blood loss at birth. Severe anaemia is associated with increased susceptibility to infections due to lowered resistance to disease, and Hb < 4g/dl is also associated with high risk of cardiac failure, particularly during delivery or soon after delivery.[9,10]

The proportion of maternal deaths due to anaemia as estimated by WHO for the following countries are, India (16%), Kenya (11%), Nigeria (9%), Malawi (8%).[10] In developing countries, it is estimated that anaemia affects nearly two thirds of all pregnancies and about half of non-pregnant women.[1]

Women with severe anaemia are unable to endure the stress of labour or blood loss at delivery. Therefore, they at the risk of acquiring a blood transfusion during labour and delivery thus exposing them to the risk of blood borne pathogens and infections including human immunodeficiency virus (HIV).[11,12]

Anaemia even when mild to moderate could result in fatigue, stress, reduced sense of well being and reduced work productivity.[2,4,-6] In addition, severe maternal anaemia will impair the oxygen delivery to the fetus and interfere with normal intra uterine growth, resulting in intrauterine growth restriction, low birth weight and possibly stillbirth or neonatal death. Newborn Infants of anaemic mothers have reduced iron stores and are at risk of anaemia during infancy and increased risk of other infant morbidities and mortality.[13,14] Antenatal care should be concerned with the earliest detection, prevention, and management of anaemia since it is the most frequent maternal complication of pregnancy[15].

In pregnancy, there is increased demand for the various factors required for erythropoiesis such protein, mineral (iron), trace elements (zinc, cobalt, and copper), vitamins (folic acid, vitamin B_{12}, vitamin C, vitamin B_6) and hormones (erythropoietin, androgens and thyroxine).[5,16] Inadequate supply of any of these during pregnancy could predispose to anaemia.

The aetiological factors for anaemia in pregnancy include red cell destruction as in sickle cell disease (SCD) and malaria, increased corpuscular loss as in haemorrhage or decreased erythrocyte production as in severe nutritional deficiency or chronic disease. Morphological classification of the size of the red blood cells in anaemia into microcytic, macrocytic or normocytic reflects the predominant aetiological factor of the anaemia as in iron deficiency, folate deficiency or non-micronutrient deficiency anaemia respectively. Also, the classification of anaemia as hypochromic, normochromic or hyperchromic depicts iron deficiency or non-iron deficiency anaemia. Distinct morphological red blood cell patterns are produced when anaemia results from either iron or folate deficiency alone. However, if there are multiple nutrient deficiencies, mixed morphological patterns result.

Studies have consistently shown that the most common cause of anaemia in pregnancy worldwide, even in Sub-Saharan Africa, is iron deficiency. This is often worsened by blood loss due to hookworm and or malaria infestation in many tropical countries and this accounts for 75% of all anaemia diagnosed during pregnancy in developing countries. Folate deficiency has also been described and recent studies suggest that deficiencies of other vitamins can also contribute to anaemia in pregnancy.[3,5,16-23]

Environmental and other socio-biological predisposing factors to anaemia in pregnancy include malaria, high parity, low socio economic status, late booking, decreased child spacing, chronic hookworm infestation, human immunodeficiency virus infection, and haemoglobinopathies.[3, 20-26] Other indirect factors such illiteracy and misconceptions resulting in cultural food taboos. One study in Nigeria showed that some types of food avoided during pregnancy provide all the key nutrients (calcium, iron, vitamin A, folic acid, vitamin C) needed by pregnant women.[27] Such misconceptions by the pregnant women themselves are common with rural populations. Studies in Sierra Leone have shown that some group of women think that worm infestation drains the blood of filth while other groups of pregnant women in India and Thailand believe that iron and vitamin supplementations in pregnancy will cause them to have big babies.[28,29,30]

The recommended interventions, for the prevention of anaemia in pregnancy, have been shown to be feasible and cost effective. These interventions reduce maternal, fetal and perinatal morbidity and mortality. However the actual prevalence of anaemia in pregnancy and the related aetiological factors are unknown for many individual countries and communities where this is prevalent. Thus, it was recommended at the African Regional Consultation on the Control of Anaemia in Pregnancy and the WHO that simple studies of

prevalence and aetiology should be undertaken.[31]

The interventions recommended by WHO include universal oral iron supplementation for pregnant women with 60mg of elemental iron and 250μg of folic acid once or twice daily for 6 months in countries with prevalence of anaemia of less than 40% and an additional 3 months post partum in countries where the prevalence is more than 40%.[31,] Studies have shown improved maternal and perinatal outcome by routine iron supplementation during pregnancy.[3,4,7,31,]

AIMS AND OBJECTIVES

- To determine the prevalence of anaemia and factors that influence aneamia in pregnancy in rural women prior to commencing antenatal care.

MATERIALS AND METHODS

STUDY SETTING: This a descriptive study conducted in the antenatal booking clinic and laboratory of Irrua Specialist Teaching Hospital, Irrua, Edo state between April 1st, 2012 and August 1st, 2012. Irua Specialist Teaching Hospital is a tertiary care hospital and a referral centre for parts of Edo state and neighboring states. It has an average of 1500 antenatal bookings annually. The hospital has 42 gynaecological and 48 obstetric beds and undertakes an average of 1,200 deliveries annually. The sample size of 380 was calculated using the statistical formula, based on the 40.4% prevalence of anaemia in pregnancy at booking and a confidence level of 95%.

STUDY POPULATION

Three hundred and eighty (380) consecutive pregnant women with or without clinical symptoms of anaemia who came for booking in this hospital were recruited into this study.

METHODS

Structured interviewer questionnaires were administered to the women eligible for the study. The questionnaire captured the bio-data, socio-demographic characteristics and information on current and previous pregnancies.

Two millitres (2ml) of peripheral venous blood was collected from each woman into an EDTA container and their packed cell volume (PCV) determined in the laboratory.

INCLUSION CRITERIA

i. Healthy Patients with singleton pregnancy.

EXCLUSION CRITERIA

i. Patients with multiple gestations.
ii. Patients with retroviral disease.
iii. Patients with sickle cell disease or haemophilia
iv. Patients with vaginal bleeding in the current pregnancy.

DATA ANALYSIS

Data were analyzed using the Statistical Package for Social Sciences (SPSS) software Version 17. There was cross-tabulation of various variables against PCV. Proportions were compared using the Chi-square test. *P* value of <0.05 was considered significant.

RESULTS

The mean age of the studied population was 30.2 ± 5.2 years. Parity ranged from 0 to 6 (mean $\pm$ SEM, 1.37 ± 0.075 per women). The mean gestational age at booking was 16.5 ± 7.6 weeks. One hundred and forty nine (39.2%) of the study population were nulliparous, 81 (21.3%) were primiparous, 138 (36.3%) were multiparous, and 12 (3.2%) were grand multiparous women. The mean packed cell volume for the women at booking was $33.9 \pm 3.1\%$ (range was 25-44%). One hundred and thirty two (34.7%) of the study population had anaemia (packed cell volume pcv < 33%) at booking, out of which 111 (84.1%) had mild anaemia and 21 (15.9%) were moderate anaemia. About 24.5% of women who booked in the first trimester had anaemia compared to 41.6% and 47.8% for second and third trimester respectively. See table 6.

The Patient's age and birth interval affected the packed cell volume of pregnant women at booking ($p < 0.05$). Parity significantly affected anaemia ($p = 0.000$) as did the level of education. Those with no formal education all had anaemia (100%) while the proportion of those with anaemia were 59.6%, 48.1 % and 20.8% for primary, secondary and tertiary education respectively. See tables 1, 2 & 3.

There was significant association between occupation and anaemia ($p < 0.05$). Three hundred and forty one (87.7%) pregnant women had received pre-booking heamatinic with less prevalence of anaemia when compared to 39 (10.2%) who were not on heamatinic. See table 4.

DISCUSSION

The prevalence of anaemia in pregnancy amongst this population of rural women was 34.7%. Most of the patients with anaemia in this study were of the mild variety, whereas 15.9% had moderate anaemia. These values are similar to data from other parts of Nigeria with high prevalence rates of anaemia in pregnancy.[6,15,17,22,23] The very low incidence of anaemia in Enugu in 1979 study could have been largely attributed to the use of haemoglobin concentration of 10g/dl (PCV 30%) to denote anaemia in pregnancy.

There was no case of severe anaemia in pregnancy (PCV<21%) in this study, unlike in Sagamu and Southern Malawi studies were severe anaemia in pregnancy constituted 0.7% and 3.6% of anaemia cases respectively.[15,31]

The absence of severe anaemia in this population may be attributed to general health consciousness and widespread use of heamatinic and possibly prophylactic antimalarial drugs prior to booking for antenatal care services in this hospital. It was noted in this study that most women who come to antenatal clinic have been attending other clinics before presentation where they were all placed on haematinic.

It is a common practice in Nigeria for women to place themselves on heamatinic as shown in this study where 340 (89.5%) of the study population were on pre booking heamatinic see table7.

This finding could also be due to the fact that many pregnant women in Nigeria book in several hospitals where they are being placed on heamatinic and prophylactic treatment for malaria, which could have happened prior to booking in this hospital

There was significant difference in packed cell volume among maternal age groups and parity, as seen tables 1 and 2. This concurs with some the findings in developing countries. Anaemia occurred more in the teenage mothers followed by mothers aged more than 35years. It also occurred more in multiparous women the older multiparous women as a result of repeated child bearing. The young teenage mothers possibly had pre-pregnancy anaemia, poor nutrition, effects of malaria or a combination of all these factors.

Prevalence of anaemia in pregnancy tends to increase with rising parity owing to repeated drain on the maternal iron reserves. In fact, multiparity and much more so grand multiparity, especially when pregnancies have occurred in quick succession is traditionally regarded as a cause of anaemia in pregnancy.

This study found a statistically significant association between parity and anaemia at booking. Anaemia being highest amongst the primiparae and multiparae, lower among the nullipara/primigravida and lowest among the grandmultiparae. This report is not immediately clear as it deviates from known effect of parity on anaemia. However, local factors such as better income abilities as in table 4 with resultant better nutrition may be responsible for this finding in this study.

There was statistically significant relationship between the women's ability to generate income and anaemia in this study. This ability to generate income may to some extent neutralize the effect of rising parity if the older women are better educated or skilled and so could generate more income.

This study also observed a relationship between prevalence of anaemia and increasing gestational age at booking, which is similar to the findings in the Enugu study. Those who register late may have pregnancies on going for the period prior to registration without iron supplementation. All pregnant women were at the risk of anaemia in pregnancy throughout the gestational period, thus early booking for antenatal care, when the iron reuirements are still low accompanied with early commencement of haematinic would serve as an important preventive measures against anaemia in pregnancy while those who registered late when iron requirements are high are likely to present with anaemia in pregnancy.

CONCLUSION

Anaemia is prevalent in the rural women of Irrua at booking. Parity, formal education and use of haematinic prior to booking all play significant roles in the occurrence of anaemia in pregnancy. The study suggested that anaemia may predate the pregnancy in the majority of cases. Health Education and public enlightenment is very important in reducing anaemia in pregnancy. Family planning and adequate child spacing is important in allowing the mothers replenishing iron stores.

Preconception care should be encouraged which will include iron and folic acid supplementation as well as antimalarial prophylaxis and family planning to reduce this problem during pregnancy.

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TABLE 1. AGE AND ANAEMIA

Age (yrs)	Frequency	Anaemia PCV <33%	Moderate anemia PCV 21-29%	Mild anaemia PCV 30-32%	Anaemia in age groups
15-19	3(0.8%)	3(0.8%)	0(0%)	3(0.8)	100%
20-24	60(15.8%)	28(7.4%)	6(1.6%)	22(5.8)	46.7%
25-29	147(38.7%)	44(11.6%)	3(0.8%)	41(10.8%)	29.9%
30-34	116(30.5%)	34(8.9%)	6(1.6%)	28(7.4%)	29.3%
>>35	54(14.2%)	23(6.1%)	6(1.6%)	17(4.5%)	42.6%
TOTAL	**380(100%)**	**132(34.7%)**	**21(5.5%)**	**111(29.2%)**	
X^2=20.006	**df=8**		**p=0.006**		

TABLE 2. PARITY AND ANAEMIA

Parity	Frequency	Anaemia PCV<33%	Moderate anaemia PCV (21-29%)	Mild anaemia PCV (30-32%)
Nullipara	149(39.2%)	37(9.7%)	9(2.4%)	28(7.4%)
Primipara	81(21.3%)	37(9.7%)	6(1.5%)	31(8.2%)
Multipara	138(36.3%)	58(15.3%)	6(1.5%)	52(13.7%)
Grand Multipara	12(3.2%)	0	0	0
Total	**380(100%)**	**132 (34.7%)**	**21(5.5%)**	**111(29.2%)**
		X^2=23.608	df=6	p=0.000

TABLE 3. EDUCATION AND ANAEMIA

Level of education	Frequency	Anaemia PCV<33%	Moderate anemia PCV 21-29%	Mild anaemia PCV30-32%
None	4(1.1)	4(1.1%)	0	4(1.1%)
Primary	52(13.7)	31(8.2%)	6(1.6%)	25(6.5%)
Secondary	108(28.4)	52(13.7%)	12(3.16%)	40(10.5%)
Tertiary	216(56.8)	45(11.8%)	3(0.8%)	42(11.1%)
TOTAL	**380(100)**	**132 (34.7%)**	**21(5.5%)**	**111(29.2%)**
	X^2=55.080	df=6	p=0.000	

TABLE 4. OCCUPATION AND ANAEMIA

Occupation	Frequency	Anaemic PCV<33%	Moderate anemia PCV=21-29%	Mild anaemia PCV=30-32%
Unskilled	109(28.7%)	54(14.2%)	12(3.1%)	42(11.1%)
Semi-skilled	63(16.6%)	29(7.6%)	6(1.6%)	23(6.1%)
Skilled	208(54.7%)	49(12.9%)	3(0.8%)	46(12.1%)
TOTAL	**380 (100%)**	**132(34.7%)**	**21(5.5%)**	**111(29.2%)**
		X^2=31.921 df=4	p=0.000	

TABLE 5. INTERVAL FROM LAST DELIVERYPREGNANCY AND ANAEMIA

Interval from last delivery	Frequency	Anaemic PCV<33	Moderate anemia PCV 21-29%	Mild anaemia PCV 30-32%
7-12months	22(5.8%)	15(3.9%)	0	15(3.9%)
13-24months	107(28.2%)	38(10%)	3(0.8%)	35(9.2%)
>24months	102(26.8%)	42(11.1%)	9(2.4%)	33(8.7%)
Not applicable	149(39.2%)	37(9.7%)	9(2.4%)	28(7.4%)
TOTAL	380(100%)			
	X^2=26.719	**df=6**	**p=0.000**	

TABLE 6.TRIMESTER AT BOOKING AND ANAEMIA

Trimester at Booking	Frequency	Anaemic PCV<33	Moderate anemia 21-29%	Mild anaemia 30-32%
1st Trimester	158(4.6%)	38(10%)	3(0.8%)	35(9.2%)
2nd Trimester	173(45.5%)	72(18.9%)	6(1.6%)	66(17.4%)
3rd Trimester	49(12.9%)	22(5.8%)	12(3.6%)	10(2.6%)
TOTAL	308(34.7%)	132(34.7%)	21(5.5%)	111(29.2%)
	X^2=36.757	**df=4**	**p=0.000**	

TABLE 7 USE OF HEMATINICS PRIOR TO REGISTRATION AND ANAEMIA					
		PCV GROUP			TOTAL
		21-29%	30-32%	>32%	
Pre-Booking	YES	0	93	248	341
Hematinics	NO	21	18	0	39
TOTAL		21	111	248	380
	X^2=145.960		df=2	p=0.000	