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AN INVESTIGATIVE STUDY ON PREVALENCE OF ANAEMIA AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC IN ANYIGBA, KOGI STATE, NIGERIA

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ABSTRACT

Anaemia is one of the most frequently observed health problems in the world today, especially among vulnerable groups like pregnant women. Data on blood parameters (Hb and PCV) of the subjects studies were collected from three selected hospitals in Anyigba, Kogi State. Seventy pregnant women were randomly selected from each hospital to assess and compare the prevalent of anaemia between 1998 and 2004. Effect of paracity on their blood parameter was also studied. Prevalence of anaemia was categorized into percentage of subject with severe anaemia, moderate, or acceptable levels of blood parameters. Among the 160 pregnant women studied 27.5% had severe anaemia, 60.6% moderate and 11.9% acceptable. Severity of anaemia increased with increased paracity. Anaemia was found to be more prevalent among women of lower-economic status.

INTRODUCTION

Anaemia is considered to be a disorder characterized by a blood haemoglobin concentration lower than the defined normal level for the age and sex of an individual. WHO definition for anaemia in pregnancy is said to be Hb < 11g/dl (Audu, 2001). Anaemia is one of the most frequently observed nutritional deficiency diseases iii the world today (WHO, 2004). According to WHO (2004) statistical analysis on the prevalence of anaemia, 06%- 80% of the world's population are anaemic. The prevalence rates are said to be higher in the developing than in industrialized countries. The most affected groups are thought to be pregnant and other adult women, pre- school children age and school age children and adolescent girls (Ganey, 2005).

Aetiology of anemia: Anaemia is caused by insufficient dietary intake of iron or any of the haemopoietic nutrients, while malabsorption conditions, chronic gaststro - intestinal tract bleeding especially from book worm, haemolytic diseases including malaria, sickle cell are known to be significant causes of anaemia Audu (2004), Wardlaw (2000). Of these causes iron deficiency anemia has received the most attention in tile world over, particularly in the most vulnerable groups pregnant women, women in general and children Audu, (2004).

Symptoms of anaemia: According to Audu (2004), in his clinical observation of anaemia in pregnant women, the typical symptoms of anemia includes tiredness, pale appearance, irritability, palpitation, glossitis, vomiting, diarrhoea, oral fissures, irregularities of the nails, pyrexia among others.

Iron absorption and utilization: Iron (fe) is one of the trace minerals found in every living cell and contributes about 5g (about a tea spoon) to the total human body content - Wardlaw (2000). The bioavailability of iron from the diet is determined by the nature of the diet. Two types of h-on are present in food, heme and non heme iron. Home iron conies from the haemoglobin in dietary meat, poultry and fish, typical of diet type of the affluent. The body absorbs a greater percentage of heme iron and its absorption is less affected by other dietary constituents. On the other hand, non - heme iron comes from whole grains, vegetables and legumes inform the typical diet of the lower economic class. Iron absorption tends to be poor in meals from this food groups because of the presence of phytic acid, grain fibers and oxalic acid as food in vegetables, tanin as found in tea can all bind iron reducing its absorption but for the addition of foods containing organic acids like vitamin 'C ' or in-organic as in gastric hydrochloric acid (HCL) which have been shown to substantially increase the absorption of iron by promoting the conversion of the insoluble ferric form to the soluble ferrous form from the entire meal. Consuming food sources of heme and non home iron together have been shown to increase non- home iron absorption (iron absorption experimental analysis of Wardlaw (2000) and WHO (2001). This means that the presence of meat, fish and poultry facilitates absorption from vegetable sources.

Iron binds to apoferritin in the intestinal cells to form ferritin. Ferritin provides a short term form of iron shortage in intestinal cells. Eventually the iron is neither absorbed or sloughed off into the GIT h the intestinal cell. Lack of production of stomach acid experience by many elderly people can lower their iron absorption. Iron absorption occurs primarily in duodenum and upper jejunum. At the cell membrane the brush border, fe^{3+} binds to a receptor protein called membrane iron binding protein which finally transfers iron into absorptive cell - Wardlaw (2000). Home iron follows a different absorptive process. It is likely absorbed directly into the absorptive cells after the globin (protein) fraction has been removed. Once inside the absorptive cells, the iron is released from the heme portions. The body conserves and re-uses iron released from dead red blood cells over and over - Wardlaw (2000). When iron stores are adequate all the iron binding sites on transferrin are fully saturated. Iron status can therefore be assessed by measuring the blood level of transferrin iron binding protein.

Since about seventy percent of iron in the body ends up in the hemoglobin molecules at the red blood cells and Myoglobin in muscle tissue, assessment of iron nutriture can be done by measuring the hemoglobin (Hb) level or the packed coil volume (PCV) of the red blood cell which in turn could be used to assess a state of anemia - Wardlaw (2000). Some iron are in the form of forritin/hemosid stored mainly in the liver, some in the bone marrow and a small portion goes to other body cells or to the spleen - Wardlaw (99). If dietary intake of iron is

inadequate eventually these iron stores become depleted and symptoms of an iron deficiency anemia begins to appear -Wardlaw (2000) and WHO (2001.). Improvement of iron nutritional status of an individual could be lone through enhances dietary iron by co- selection of foods that are highly rich in iron e.g. meat (especially liver), yolk, beef; pork, kidney (organ meat), certain vegetables like spinach, prunes, broccoli, apricot, oyster etc. Iron enrichment flours and cereals or any other food stuff commonly consumed by the population is another means of improving iron intake - Wardlaw (2000). Targeted iron malnutrition intervention could be done through losing with iron preparations under medical supervisions as part of medicare to improve the iron status of an individual - Audu (2004).

The RDA for iron for a "reference" woman range from 10mg in some countries to 18mg in iron requirement to meet the need for foetal growth, placenta, and the expanded blood volume. It is thought to be almost impossible for the pregnant women to obtain the required iron through diet alone and hence the United States Food and Nutrition Board of the Nutritional Research Council recommended that pregnant women obtain 18mg dietary iron plus a supplement providing 30 - 60mg of iron daily Guthrie, H.A. (2000). In Nigeria situation, the FGN Micro Nutrient Initiatives/UNICEF' (2001) established nutritional policies and programmes aim at combating micronutrient (Vitamins/minerals) deficiency among the vulnerable groups in Nigeria. Such policy and programmes are :- promotion of dietary diversification towards increased consumption of foods rich in iron, folic acid , vitamins, protein and other nutrients, Food fortification of iron and vitamins, Home garden, Iron supplementation programme, Health programme / public health centre establishment and improvement of the existed ones.

STATEMENT OF PROBLEM

It has been shown that more than half of the population live with iron deficiency anemia especially pregnant women, children and adolescent girls – FGN/UNICEF initiatives on arresting anemia (2001). This study seeks to assess the prevalence of anaemia among pregnant women and compare same among women attending a private hospital, government hospital and a mission hospital in a semi urban environment.

Justification: It is appropriate to evaluate the FGN/UNICEF intervention on the blood parameters of the pregnant women in Anyigba.

Objective: The Objectives of this study are:

i. To assess the prevalence of anaemia among pregnant women who attended ante-natal clinics of three selected Hospital in Anyigba between 1998 and 2004.
ii. To compare the prevalence of anaemia among pregnant women attending ant- natal clinics within the period of 1998 – 2001 to that prevailing between 2001 and 2004. Post FGN/UNICEF initiatives on iron deficiency anaemia.
iii. To assess the effect of paracity on blood parameters of pregnant women.
iv. To compare the Hb and PCV blood parameters of pregnant women from differing socio- economic groups as indicated by government and private-owned hospital.
v. To evaluate the effect of FGN/UNICEF initiative on iron deficiency anaemia.

SIGNIFICANCE OF STUDY

To bring to awareness the prevalence of anaemia among women who attend ante-natal clinics and hence reflect on the position of non-clinic attending pregnant women.

LIMITATIONS OF THE STUDY

i. The study was limited to pregnant women in their third trimester attending antenatal clinic because of the unwillingness of subjects to readily submit themselves to blood sampling.
ii. The dietary evaluation of the individuals were not conducted to find adequacy of their diets in haemopoietic nutrients.

LITERATURE REVIEW

FGN/UNICEF (2001) estimation reports on the prevalence of anaemia among the vulnerable groups in Nigeria indicate the prevalence rates of anaemia in pregnant women to be in the range of 40130%, 40-55% adolescent girls and 56% in school age children. Davey *et al.* (2002) reported that red blood cells are made by the body in the bone marrow and live for about four months before they are destroyed and replaced as part of a normal renewal process. According to Audu (2004), anaemia in pregnancy is characterized by premature labour, infections e.g. in the urinogenital tract. He furthered that a pregnant woman who has sufficient nutrients (iron, foliate, vitamin B_{12}, protein etc) store to provide for her increase in haemoglobin mass during pregnancy and breast feeding for six months before delivery will be found to have her needs covered by adequate intake of dietary nutrient. Vitamin/mineral deficiency damage assessment report for Nigeria presented at Abuja, October 28, 2004 by Micro Nutrient Initiative and UNICEF of 2001 showed 40-60% of Nigerian children between ages 6-24

months are exposed to health risks due to iron deficiency. An estimated 11,000 deaths are reported to occur among young mothers at child birth every year due to iron-deficiency anaemia.

Sinnott, (2005) in her clinical observation of anaemia in pregnant women reported that the typical symptoms of anaemia includes; tiredness, pale appearance, irritability, palpitation l shortness of breath, adding that severe and prolong nutrient deficiency may produce painless glossitis, dryness in the mouth and throat, mouth soreness, difficulty in swallowing and brittle hair among others. Similarly Audu (2004), in his studies of possible health effect and social complication of anaemia in pregnant mothers, he stated that anaemia could result in severe morbidity and reduces the resistance to blood loss associated with normal delivery. He further observed that heart failure, prematured birth, disability could result due to anaemia. Studies on the effect of anaemia also stated that, anaemia reduces the work capacity of an individual and entire populace bringing serious economic consequences and obstacles to national development WHO (2004). Audu proposed the following strategies for the prevention of anaemia - i.e. adequate dietary habits to enhance effective absorption of nutrients. For instance separation of tea drinking from meal tune by one or two hours so that the tea will not inhibit iron absorption, including fruit juices or another source of ascorbic acid in the meal, to enhance absorption, consuming milk and other diary products as a between meal snack rather than at meal time.

Wardlaw (2000) in his finding on iron absorption studies in human GIT stated that a meal pattern of consuming foods containing inhibitors at meals with foods lowest in iron contents. For instance, a breakfast of a low -iron cereal (broad) consumed with tea or milk product provides adequate calcium absorption without hampering iron nutrition. Prevention strategies of alleviating anaemia according to WHO/UNICEF (2001) include initiatives of food fortification -mainly cereals with iron, vitamin and minerals in emergency food supplementation. Other proposed preventive measured are parasitic disease and infection control programmes like malaria control programme, hook worm infection control programme to minimise red blood cell loses, making incentive policies and improving farming systems to enhance diet diversification and utilization :f foods that will enhance nutrient absorption has also been suggested.

According to WHO/UNICEF (2001), iron supplementation is one of the measure used in controlling and treating anaemia. Iron supplementation given a smaller doses 3 or 4x a day is said to improve utilization than a single large dose – Guthrie (2000). At large doses the percentage of iron utilization is said to vary inversely with the size of the dose – Balogun (2003). This means that at large

doses iron utilization tends to be poor compared to smaller doses. Iron tablet or injection are prescribe by the medical professionals. However, abuse of iron supplementation thereby leading to other complication which could affect the well-being of an individual has been cautioned. The apparent drop in Hb levels during pregnancy is said to offer reflect an increase in blood volume rather than an absolute drop in the amount of haemoglobin – Guthrie, H.A. (2000), hence the low percentage haemoglobin levels used as acceptable.

MATERIALS AND METHOD

Sampling Area: Data on blood parameters of the subjects studying were collected from Grimard (Mission) Hospital Anyigba (Hospital 'A'), Maria Gorretti (Private) Hospital Anyigba (B) and Kogi Diagnostic and Reference (General) Hospital Anyigba 'C'.

Experimental Subjects: The population studied was pregnant women in their third trimester of various Paracity who presented at the ante natal clinic of the selected hospitals between 1998 and 2004. The total number of seventy pregnant women were selected randomly from each hospital by recording the first ten pregnant women available from the medical record in any one year within the stated period. The haemoglobin (Hb) and haematocrit (PCV) values of the subjects under study are presented in Appendix (1), Appendix (2) and Appendix (3).

Procedure for blood parameter test

Packed cell volume determination micro - haematocrit method- Apparatus/ materials - lancent, Haematocrit centrifuge, capillary tube, plasticine/ sealer, cotton wool, micro haematocrit reader, methylated spirit.

Procedure: The tip of the finger was cleansed with spirit swab. The finger tip was pricked with lancent. The finger tip was pressed and the first drop of blood was wiped off. The finger was also pressed again and the heparinised capillary tube was filled with ¾ full of blood. One end of the capillary tube was sealed with plasticine and placed in the haematocrit centrifuge for spinning -The centrifuge machine was covered and switch on for five minutes (The centrifuge was set at five minutes and switch on until the pointer returned itself to zero minute and it stop itself). After the haematocrit centrifuge has spun for five minutes, the packed cell volume (PCV) reading was taken using micro haematocrit reader.
Haemoglobin determination (Salis method). Apparatus/materials: Salis apparatus (Salis Standard), lancent, swab, haemoglobin pipette (0.02 ml), N_{10}Hcl acid.

Procedure: The finger was cleansed with spirit swab. The finger tip was pricked using lancent. The first drop of blood was wiped off. The finger tip was pressed and blood was drawn into 0.02 ml haemoglobin tube. Caliberated Salis tube was filled at 20 ml with $N_{10}HCL$ acid. The blood was washed into the acid in Salis tube. It was mixed well and allowed to stand for five minutes. The colour was compared to the standard Salis colour under bright light.

N/B:- The reading can be taken at this stage if only the colour matches the standard Salis colour. Hydrochloric acid was added in drops and nixed properly until the colour matches the standard Salis colour. The reading was taken at the number which the colour matches the standard Salis colour.

The standard Hb level of blood used by the three selected Hospitals for classifying the prevalence of subjects with severe anemia, moderate and acceptable level of blood parameter is given as;

Hb of 50–59% lower equivalent to 7g/100ml (severe)

Hb 60–69% _____ 9g /lOOm (moderate)

Hb of 70% above _____ 10g/100ml (Acceptable) (Maurice, 1976).

The data collected from the selected hospitals are as recorded in Appendices 1,2, and 3.

RESULTS AND DISCUSSION

The prevalence of anaemia among pregnant women:- Among the total number of pregnant women studied, 27.5% have severe anaemia, 66.6% have moderate and 11.9% acceptable as seen in table 1.

Table 1: Prevalence and severity of anaemia in pregnant women

Severe %	Moderate %	Acceptable %
27.5	60.6	11.9

Histogram showing prevalence and severity of anaemia among pregnant women.

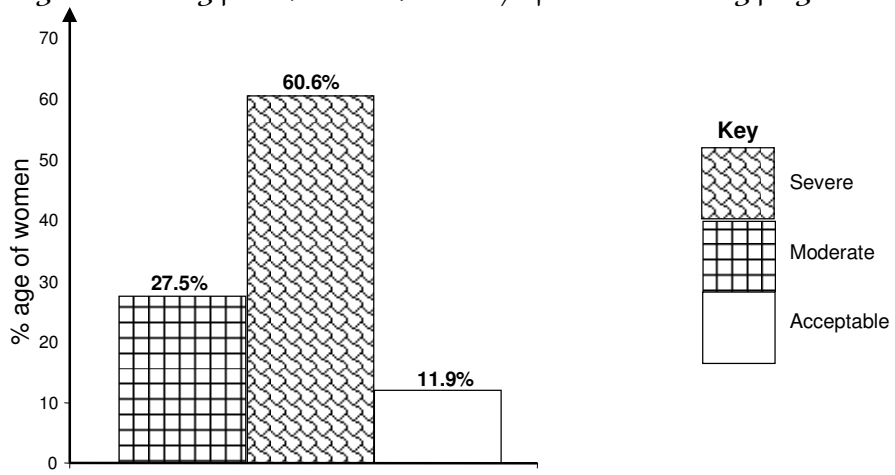

Figure ii a – Prevalent of anaemia among pregnant women from Mission Hospital (a) (1998-2001).

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Effect of Socio-economic status on prevalence of anaemia among pregnant women: Anaemia was found to be more prevalent among women of lower economic status as seen in table 2.

Table 2: Effect of socio- economic status on prevalence of anaemia.

Hospital Type	Severity of anaemia					
	Severe %		Moderate %		Acceptable %	
	1998-2001	2001-2004	1998-2001	2001-2004	1998-2001	2001-2004
Mission hospital(a) (Free-paying)	25	22.5	62.5	65	12.5	12.5
Private hospital(b) (Fee-paying)	30	27.5	60	62.5	10	10
General hospital(c) (Free consultation)	2003–2004 50		2003–2004 40		2003 – 2004 10	

The results are as found in table (2) is represented by histograms

(a)

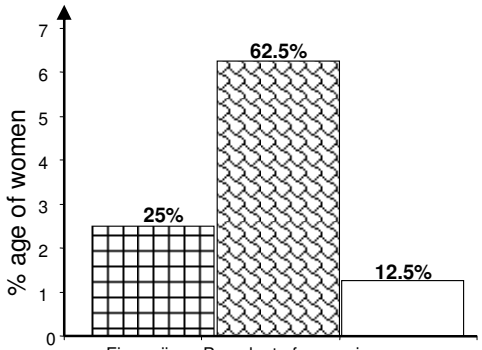

Figure ii a – Prevalent of anaemia among pregnant

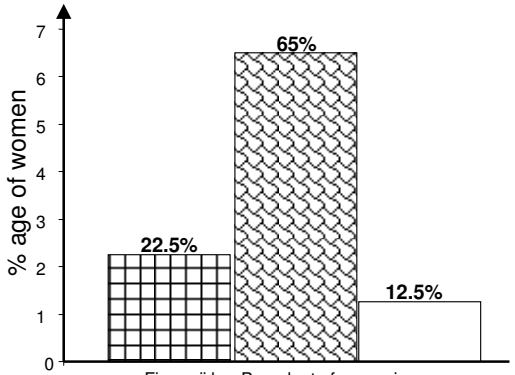

Figure ii b – Prevalent of anaemia among

(b)

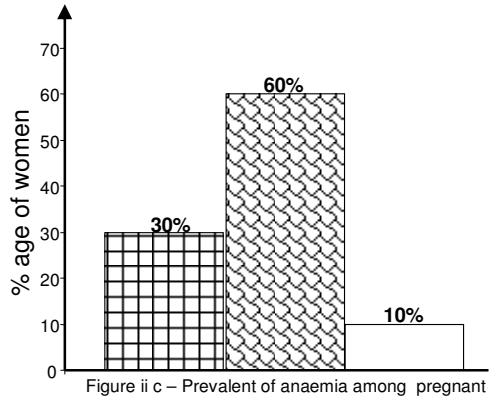

Figure ii c – Prevalent of anaemia among pregnant women from private hospital (1998-2001).

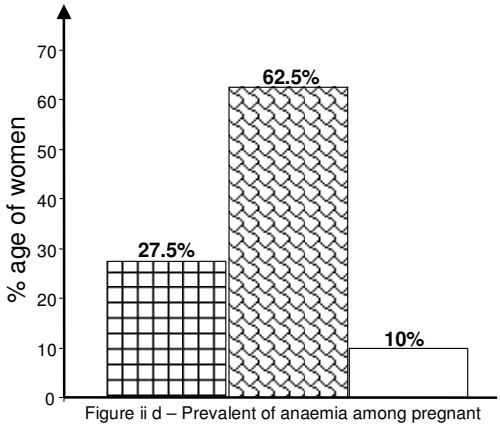

Figure ii d – Prevalent of anaemia among pregnant women from private hospital (2001-2004).

(c)

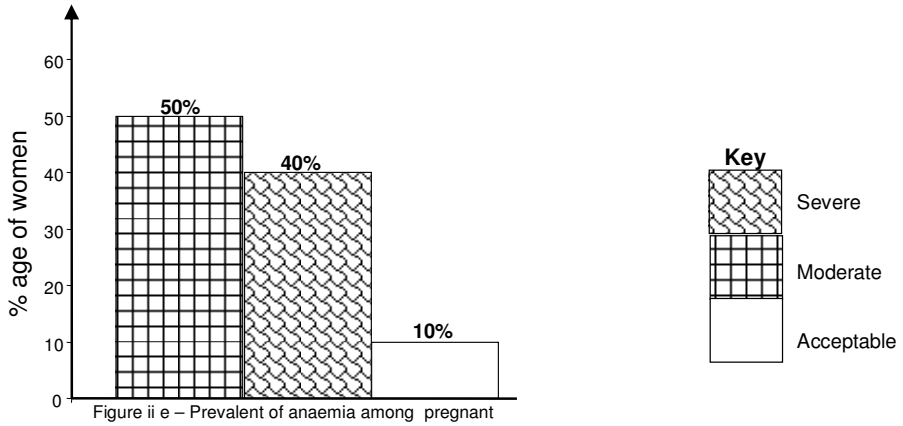

Figure ii e – Prevalent of anaemia among pregnant women from General Hospital (2003-2004).

Effect of Paracity on Blood Parameter of the Pregnant Women: Severity of anaemia increases with increased paracity as seen in Table 3.

Table 3: Effect of paracity on prevalence of anaemia in pregnant women.

Paracity	Severe %	Moderate	Acceptable %
Primip	13	55	32
1-2	13.2	79.4	7.4
3 above	55.6	40.7	3.7

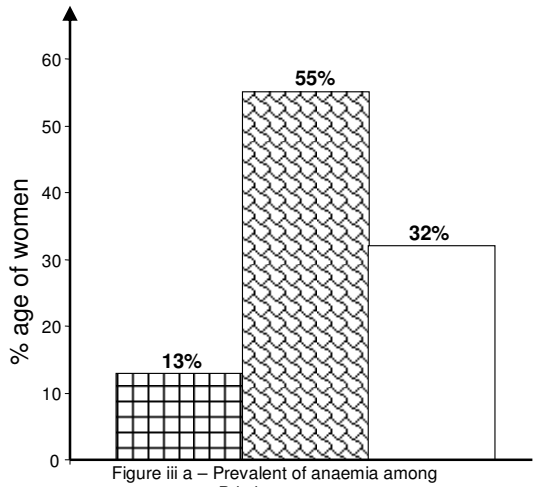

Figure iii a – Prevalent of anaemia among Primip women

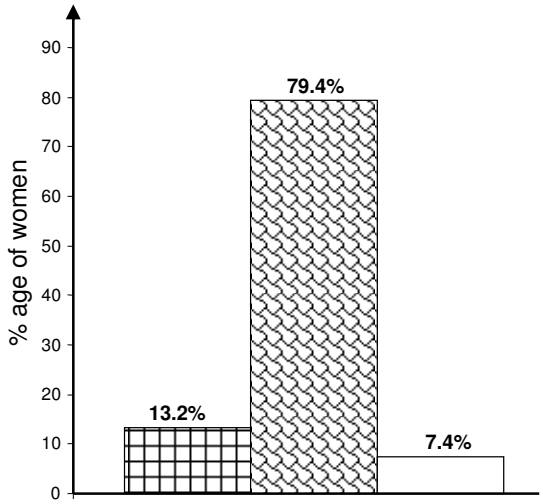

Figure iii b – Prevalent of anaemia among Pregnant women with 1-2 paracity

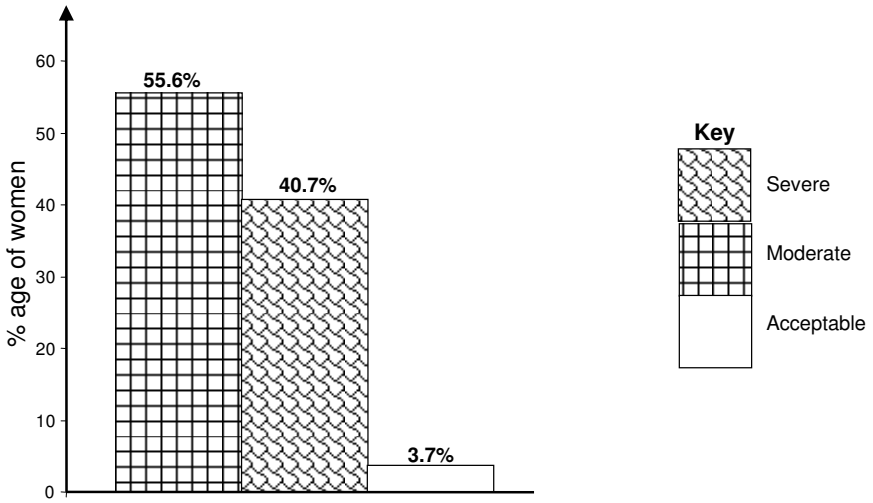

Figure iii c – Prevalent of anaemia among
Pregnant women with 3 – above paracity.

From table 3 figure iii, paracity has effect on the prevalence of anaemia among the subjects under study. The data shows that the prevalence of anemia increases with increased paracity (especially those with paracity ranging from 3 above) which could be due to frequent or n-occurring pregnancy, in- ability to measure up the individual nutriture before the next pregnancy, excess blood loss during delivery among others. This trend agrees with Audus observation in another study (Audu, 2004). The socio-economic status also has effect on the prevalence of anaemia among the pregnant women. From table 2 figure ii, the prevalence of anaemia is very high among the pregnant women who attend free consultancy service hospital (c) compare to those of fee paying hospitals (A&B). This is because pregnant women who attend free Consultancy services hospital are said to be low income earners while those attending fee-paying consultancy service hospital are said to be high income earners. Table 1 figure i, indicate that out of the total women studied, 27.5% have seven anemia, 60.6% moderate and 11.9% acceptable. This shows that the prevalence and severity of anaemia among pregnant women is still high. This may be due to in- adequate diet, chronic blood loss, malabsorption conditions, infections among others. The study also shows that the three selected hospital give iron (ferrous sulphate), folic acid and other supplement to the pregnant women who attend ante natal care in the clinics. The dose usually instructed is one for 3 times a day throughout the 3 trimester according to the specialists, but probable now compliance of some clients in adhering to the instruction contributed to the prevalence rate. This trend agrees with Guthrie and Balogun observations in another study – Guthrie H.A. (2000) and Balogun (2003).

SUMMARY

This research was carried out with the aim of assessing the prevalence of anemia among pregnant women. Micro haematocrit and Sails standard methods were used to obtain the blood parameters (Hb & PCV) values. Severity of anaemia increases with increased paracity. Anaemia was found to be more prevalent among women of lower- economic status. Dietary diversification of cereals and vegetables, improvement of socio economic status of people, legislation of iron / folate food fortification programme among others are recommended in order to combat anaemia. The study was limited to pregnant women in their 3rd trimester attending antenatal clinic.

CONCLUSION

From the result of the study, out of the total pregnant women studied, 27.5% have severe anemia, 60.6% moderate and 11.9% acceptable. Severity of anaemia increases with increased paracity. Anaemia was found to be more prevalent among women of lower economic status. The finding also shows that the prevalence of anaemia is still high among pregnant women inspite of the FGN/ UNICEF initiatives on preventing anaemia.

RECOMMENDATIONS

Generally one can recommend dietary diversification especially cereals (grains) and vegetables so as to increase nutrient intake. There is also need for iron supplement and client compliance during pregnancy to enhance iron status of the individual. Improvement of socio-economic status of people can also be of a greater help. Legislation of iron / folate food fortification programme would go a long way to reduce prevalence of anaemia among the whole populace. Public health sensitization to control number and rate of paracity is recommended in order to reduce prevalence of anaemia among childbearing age women.

Suggestions for further study

(1) It is suggested that there should be further research studies on prevalence of anemia among women who do not attend antenatal clinic.

(2) Dietary evaluation, presence of worm infestation should accompany assessment of blood parameter in order to find factors incidental to presence of anaemia.

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