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RESEARCH ARTICLE

Prevalence of Anaemia in Pregnant women attending antenatal clinics in Anambra State South- Eastern Nigeria

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Abstract

Background: Anaemia is one of the adverse complications of pregnancy in women in the developing countries. The present study was designed to determine the prevalence of anaemia in pregnant women attending antenatal clinics in Anambra state, South- eastern Nigeria.

Materials and Methods: A cross sectional study involving 700 volunteer pregnant women recruited during routine antenatal care in selected hospitals in Anambra state, between January 2012 and March 2013 was conducted. Blood samples were collected under sterile condition and haemoglobin concentrations were determined by the Sahlis acid haematin method according to Cheesbrough.

Result: Out of the 700 women examined, 525 had Hb level less than 11gm/dl indicating anaemia prevalence of 75%. Hb range was 8-14gm/dl. 90 (12.9%) had Hb level less than 9gm/dl (severe anaemia) while 255 (36.4%) had Hb level 9-10gm/dl (moderate anaemia). 180 (25.7%) had Hb level between 10 and 11gm/dl (mild anaemia).

Conclusion: The study concludes that majority of the women attending antenatal clinics in Anambra state were anaemic with far reaching consequences on pregnancy outcome. This calls for early registration for antenatal care so that preventive measures such as malarial prophylaxis and nutritional supplements can be effectively carried out.

Introduction

Anaemia is commonly defined as a reduction in the haemoglobin of red blood cells with consequent deficiency of oxygen in the blood leading to weakness and palor (The free Dictionary on line). The World Health Organization has set a minimum cut- off mark for anaemia in pregnancy which is taken as 11gm/dl in the first half of pregnancy and 10.5gm/dl in the second half of pregnancy (WHO, 1972; 1992; 1993).

Extensive studies have been done on the incidence/prevalence of anaemia in pregnant women in Nigeria (Abidoye et al, 1992; Idowu et al, 2005; Nduka et al, 2006; Dim and Onah, 2007; Bukar et al, 2008; Ugwuja et al, 2010; Adesina et al, 2011). In the South East zone of the country, Nduka et al (2006) reported anaemia in 385 out of 500 pregnant women (77%). This study was carried out in two main cities in Abia state, Nigeria, namely Aba and Okigwe. At Enugu, Dim and Onah (2007) reported anaemia prevalence rate of 40.4% in a teaching hospital based study. The authors associated anaemia with late registration for antenatal by the pregnant women and the majority of them (90.7%) had mild anaemia. In another study at Abakaliki Ebonyi state, Nigeria, Ugwaja et al (2010) reported anaemia prevalence of 72.2%. In this study 63.6% of the cases were due to iron deficiency. In the South-South zone,

Okafor et al (2011) reported a prevalence rate of 61.1% and 70.1% of the sample population had evidence of malaria infection. Abidoye et al (1992) reported anaemia in 31 out of 100 pregnant women in Port Harcourt representing a prevalence rate of 31%. In a recent study, Ndukwu et al (2012) reported a prevalent rate of 62.6% in a sample of 227 pregnant women.

In the South- West zone of Nigeria, Adesina et al (2011) reported anaemia in 30% of his study population while Idowu et al (2005) had earlier reported a prevalence rate of 76.5% in a non teaching hospital based study at Abeokuta, Ogun state Nigeria. In the Northern zone, Bukar et al (2008) reported anaemia in 239 out of 461 pregnant women studied representing a prevalence rate of 51.8%. Other investigators reported anaemia prevalence rate between 33-75% (Iloabachie and Meniru, 1990; Massawe et al 1999; Ogunbode, 2003).

Some studies outside Nigeria also reported high prevalence of anaemia in pregnancy. At Porto Novo Cape Verde, Okeke (2011) reported a prevalence rate of 38.8% with majority of his sample population (160) having mild degree of anaemia. An Indian teaching hospital based study by Lokare et al (2012) reported a prevalence rate of 87.21%. The present study was therefore designed to determine the prevalence of anaemia in pregnant women attending antenatal clinics in Anambra state South- Eastern Nigeria.

Materials and Methods

Study area: The study was conducted in hospitals chosen from three different Local government areas in Anambra state, namely Awka South, Onitsha North and Nnewi North. Anambra state is located in the South Eastern zone of Nigeria with an estimated population of 4.9million people according to 2006 census (NPC, 2006). The state is bounded by Delta state to the West, Enugu state to the East, Kogi state to the North and Imo state to the South (ANSG home page, 2013). The study locations: Awka, Onitsha and Nnewi are the three major cities of the state.

Awka is presently the state capital and is mainly inhabited by traders, civil servants and students having quite a number of higher institutions including Nnamdi Azikiwe University and Paul University. The city (Awka) has an estimated population of 301,657 people according to 2006 census (NPC, 2006). The town is densely populated with inadequate infrastructural development, poor environmental sanitation (with refuse bins scattered along the major streets), and inadequate safe water supply (with a lot of the inhabitants obtaining their domestic water through water tankers, which may be subject to contamination). These factors render the environment conducive for the transmission of malaria and typhoid fever.

Onitsha is the biggest commercial city of the state with an estimated population density of 1500-2000 persons/km^2. It is mainly inhabited by traders and other businessmen with an estimated population that is bigger than Nnewi or Awka (NPC, 2006).The high population density of Onitsha mounts a lot of pressure on infrastructural developments, adequate water supply and sanitation. Consequently, there is poor environmental sanitation, inadequate water supply and congestion of residential accommodation. All these factors make the inhabitants vulnerable to high transmission of malaria and typhoid infection.

Nnewi is the second largest commercial city of the state with an estimated population of 391,227 people according to 2006 census (NPC, 2006). It is inhabited mainly by traders, civil servants and students, having the Nnamdi Azikiwe university teaching hospital (NAUTH) located in the town. Like in Awka and Onitsha, there is poor infrastructural development, poor environmental sanitation and inadequate water supply. These factors create the enabling environment for malaria and typhoid fever to thrive. Finally, Anambra state is within the Tropical rain forest of Nigeria with steady rain falls from April to October every year thus making mosquito breeding and malaria transmission stable through out the year.

Study population- A total of 700 pregnant women aged between 17 and 45 years, who came for routine antenatal services were recruited by voluntary participation between January 2012 and March 2013 from five major private and public health institutions in the state namely General hospital/Anambra state university teaching hospital (ASUTH) Awka, Divine hospital and maternity Awka, Christ the King Specialist hospital Awka, Life specialist hospital Nnewi and General hospital, Onitsha respectively. The faculty board of ethical committee, Nnamdi Azikiwe University approved the study. Informed consent was obtained from the participants after due permission had been sought for and obtained from the hospital authorities.

Sample Collection:

1ml of whole blood was collected through venepuncture from each participant under sterile condition and placed into EDTA bottle for haemoglobin estimation.

METHODS

Determination of Haemoglobin concentration

The Sahli acid haematin method according to Cheesbrough (1998) was used. The materials required were dilute hydrochloric (0.1M HCL), Sahlis haemocytometer set containing micropipette, graduated tube and Sahlis haemometer colour chamber.

Principle: The hydrochloric acid converts haemoglobin to acid haematin. The colour produced is compared to standard colours (Cheesbrough, 1998)

Procedure: 20µml of veinous blood was drawn with a micropipette and mixed in a tube containing 0.1M/L HCL. After 10 mins, the dilute acid was added to the tube drop by drop with mixing until the colour of the solution matched that of the glass standard positioned along side of the dilution tube. The haemoglobin concentration (Hb) was read from the graduated scale on the dilution tube.

STATISTICAL ANALYSIS:

The version 16 of SPSS package was used for statistical analysis. The independent variables obtained in this study were expressed as mean (±SD). Chi square (x^2) and analysis of variance (ANOVA) were used to assess significant differences. The level of significance was considered at $P \leq 0.05$.

Results

Table 1: Haemoglobin (Hb) concentration of pregnant women attending antenatal clinics in Hospitals in Anambra State, South-east Nigeria.

Hb Concentration (gm/dl)	Frequency	Percentage
8-9	90	12.9%
9.1-10	255	36.4%
10.1-11	180	25.7%
11.1-12	125	17.9%
12.1-13	45	6.4%
13.1-14	5	0.7%
Total N=	700	100%

Note: Hb level< 11gm is considered anaemic

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Table 1 shows that majority (525) of the pregnant women attending antenatal clinics in the hospitals used for the study had Hb concentration levels below 11gm/dl suggesting an anaemia rate of 75%. Ninety of the women (12.9%) had severe degree of anaemia (Hb <9), 255 (36.4%) had moderate degree of anaemia (Hb between 9 and10) while 180 (25.7%) had mild degree of anaemia (Hb between10 and 11).

Discussion

The present study showed that 525 of the women (75%) attending antenatal clinics in the hospitals used for the study were anaemic representing a prevalence rate of 75%. The high prevalence of anaemia is in agreement with previous reports where anaemia rates have been put at between 31% to 76.5% (Abidoye et al, 1992; Idowu et al, 2005; Dim and Onah, 2007; Bukar et al, 2008; Agan et al, 2010; Ugwuiya et al, 2010; Adesina et al, 2011; Okeke, 2011; Jombo et al, 2011 Ndukwu and Dienye, 2012). The high prevalence of anaemia in the study area in particular and developing countries in general, has been attributed to socio-economic factors which include high prevalence of malaria (Flemming, 1989; Onyenekwe et al 2002; Mafiago et al, 2004; Mbanugo and Okoroudo, 2005; Okafor et al, 2010), nutritional factors such as iron deficiency (Mockenhaupt et al, 2000; Ugwuja et al, 2010) and helminthic infections (Baidoo et al, 2010). Deficiencies of other micronutrients which have been known to play some roles in erythropoeisis such as copper, zinc and vitamin A (Bloem et al, 1990) have not been ruled out since some of the women enter into pregnancy in a malnourished state as a result of poverty. A previous study in this environment had associated multiparity with anaemia in pregnancy (Ugwuja et al, 2010) especially if pregnancy spacing has not been

adequate. The low percentage of women with mild degree of anaemia had been previously reported by Lamina and Sorunmu (2003).

Maternal anaemia has far reaching consequences on adverse pregnancy outcome some of which include low birth weight babies and premature deliveries (Aribodor et al, 2008; Amosu et al, 2011a; Onwuanaku et al, 2011; Awoleke, 2012; Omole-Ohonsi and Attah, 2012). Anaemia also increases both maternal and perinatal mortality rates thereby imparting negatively on the Millennium development goals in Anambra state.

Conclusion

The presents study concludes that the rate of anaemia in pregnancy in Anambra state, Nigeria, was very high requiring urgent measures to reverse the trend. Some of these measures include early registration of pregnant women for antenatal services, effective control of malaria during pregnancy, provision of free routine haematinics to pregnant women in all government hospitals and intensified health education to pregnant women during antenatal services to improve their knowledge on preventive health and nutrition. These will go a long way to reduce maternal mortality rate thereby helping to achieve the Millennium Development Goals.

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