Research Article

PREVALENCE OF IRON DEFICIENCY ANEMIA AMONG PREGNANT WOMEN IN KISANGANI IN DEMOCRATIC REPUBLIC OF CONGO

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ABSTRACT

Introduction: Iron deficiency anemia is well-reported problem during pregnancy in both developed and developing countries. The aim of this study is to determine the prevalence of Iron Deficiency of anemia among pregnant women in Kisangani.
Material and Methods Cross-sectional study with a descriptive and multicentric aim was conducted in five hospitals of Kisangani. 1102 pregnant women were selected and at least 3 blood samples have been taken for this research, from the 15 November 2016 to November 14, 2017. SPSS software version 20.0 was used.
Results: The prevalence of iron defiency anemia was 26%, the moderate anemia was founded to 88.3% and the Hypochromic microcytic anemia was 90.4%
Conclusion: Iron deficiency anemia in pregnant women in Kisangani town is a significant concern for all public health problems in the Democratic Republic of Congo.

INTRODUCTION

Anemia is presently a common nutritional problem in the world and it is associated with potential adverse effects such as reduced power of labor and reproductive disorders [1] . Iron deficiency anemia is well-reported problem during pregnancy in both developed and developing countries. In the world the number of anemic people around 1.62 billion among which 56 million are pregnant women [2].

One of the populations most at risk for iron deficiency and resultant anemia is pregnant women, due blood volume expansion and demands from the fetal-placental unit [3, 4]

In women who become pregnant, a favorable iron status is necessary for a good course of pregnancy, for the well –being of the mother and for a normal development of the foetus and maturity of the newborn infant [5]. Iron deficiency, even in the absence of iron deficiency anemia, has a negative impact on women of reproductive age, causing impaired cognitive abilities and decreased physical performance. In pregnant women, iron deficiency anemia is associated with tiredness,

emotional instability, depression, stress, low cognitive performance tests as well as impaired physical performance, palpitations, shortness of breath, increased susceptibility to infections and reduced quality of life. Furthermore, Iron deficiency anemia during pregnancy has negative implications for the foetus /newborn, being associated with impaired brain development, premature birth, a low birth weight for gestational age and birth complications. In addition, prepartum Iron Deficiency Anemia is followed by anemia after delivery, postpartum anemia which is associated with increased peripartum maternal mortality [6,7].

In developing countries, severe anemia is the main causal factor in up to 20% of maternal deaths [8, 9].Iron deficiency anemia may contribute to increased morbidity and mortality by increasing maternal susceptibility to infection [10]. The main problem in iron deficiency anemia that public health services of many countries continue to treat iron deficiency anemia as a clinic issue and focus on treatment rather than prevention. Over the past years, there have been several global preventive strategies and approaches that address iron deficiency anemia

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which are: dietary diversification, food fortification, iron supplementation and improvement of the nutritional status of pregnant women [11].

Iron deficiency anemia is a problem of public health significance in many countries of Africa. What is the prevalence of Iron deficiency anemia among pregnant women in our town?

This study aims at determining the prevalence and the degree of Iron Deficiency of anemia among pregnant women in Kisangani.

MATERIAL AND METHODS

Study material

Study population

The study population was made up of all the pregnant women who had consulted for antenatal consultation and other reasons in the first trimester of pregnancy, and who had given birth to the health institutions selected in Kisangani town, from the 15 November 2016 to November 14, 2017. Pregnant women who have followed the antenatal consultation from the first trimester until the end of pregnancy and at least 3 blood samples have been taken (in the first, second and third trimesters of pregnancy) were eligible for this research.

During the study period, 1102 pregnant women met the eligibility criteria, 840 were anemic among that 218 had iron deficiency anemia. Were considered cases of iron deficiency anemia, pregnant women with hemoglobin less than11g / dl, serum iron < 50 μg / 100ml, Ferritine < 15 μg / L and Soluble Transferrin Receptor ≥ 2.4 μg / ml [12]. The following hospitals were selected because of their high attendance by pregnant and parturient: Makiso / Kisangani General Referral Hospital, Kabondo General Referral Hospital, Lubunga Reference General Hospital, St. Joseph Reference Health Center and Reference Health Marie Queen of Peace Matete Center.

Sampling and Sample Size

We used a Non-probabilistic sampling of convenience. In this study, the minimum sample size was 200. 12. Our sample consisted of 1102 pregnant women.

Type of Study

Cross-sectional study with a descriptive and multicentric aim.

Data Collection Technique

Data collection was prospective. During the period from 15 November 2016 to 14 November 2017, we followed all the pregnant women included in our research (those that were anemic and not anemic throughout pregnancy) to identify prevalence and other epidemiological aspects.

Data collection was done at the same monitoring period. To collect our data, we used predetermined Slip's data collection, plugs of prenatal consultation, the vacuteners tubes with and without anticoagulant. The selected pregnant women were seen 4 times during the search (First, Second, Third Trimester of pregnancy and during delivery).

The investigation team consisted of 17 people including 2 nurses and a physician (by medical structure), in total we had 5 nurses, 5 laboratory nurses and 5 physicians, the analytical laboratory assistant and the principal investigator. These investigators followed maintenance and training sessions in order to standardize the data collection interview procedure.
Data collection cards were coded and reviewed daily for completeness and consistency. In case of incompleteness or inconsistency, the missing information was completed at the next antenatal consultation.

Blood sample : venous blood that will be transported in 2 different tubes : one without anticoagulant for biochemical examinations and the other with EDTA for hemogram.

Medical laboratory

- Provincial Public Health Laboratory (Faculty of Medicine UNIKIS) ;
- The hemoglobin was made to model the HemoCue 301+ hemoglobinometer
- Serum iron and ferritin were measured using a model 2100s spectrophotometer

The physiological anemias of pregnancy were eliminated after comparison of hemoglobin, serum iron, ferritin and gestational age.

The degree of anemia is defined according to the hemoglobin:

Mild anemia at hemoglobin level <11 g / dl ≥ 10g / dl
Moderate anemia at hemoglobin level < 10 g / dl and ≥7 g / dl
Severe anemia at a hemoglobin level <7g / dl
The morphological type of anemia was defined according to the globular constants including Mean Volume Globular (MCV) and Average Corpuscle Concentration in Hemoglobin (MCHC).

Microcytic Hypochromic Anemia : MCV <80 μ m^3 and MCH <27 pg
Normochromic normocytic anemia: MCV between 80-12O μ m^3 and MCH between 30-36 pg

Statistical Analyzes

The information collected was encoded and analyzed using SPSS software version 20.0.

The statistical calculations we used to present the results:

For the Description of the sample: the calculation of frequency and percentage; averages and their standard deviations; the median and areas of variation.

Ethical Considerations

This research presents no harm to maternal and fetal well-being. It has no consequences, either near or far, for the health of all participants. In long run, it will make it easier for pregnant women to cope with anemia. At least all pregnant women gave their verbal consent after an explanation session on the study in detail by the research team before collecting any data information.

RESULTS

Epidemiological Aspects

Prevalence of iron deficiency anemia in pregnant women

Out of a total of 1,102 pregnant women, 840 were anemic. The prevalence of anemia among pregnant women in Kisangani was 76.2%. Among the anemic pregnant women, only 218 had iron deficiency anemia, a prevalence of 26%.

Types of iron deficiency anemia

Degree of Anemia

Table 1 presents the pregnant women functions of anemia's degree

Table 1 Distribution of pregnant women according to anemia's degree

DEGREE OF ANEMIA	f	%
Mild anemia	21	9.6
Moderate anemia	192	88.3
Severe anemia	5	2.1
Total	218	100

Analysis in this table 1 shows that moderate anemia is 88.3 %. The average hemoglobin level of the population was 9 ± 1.3 g / dl.

Morphological Type

The Tableau 2 presents the pregnant women functions of morphological type of anemia.

Table 2 Distribution of pregnant women according to morphological type of anemia

Mophological type of iron deficiency anemia	f	%
Hypochromic microcytic anemia	197	90 , 4
Normochromic normocytic anemia	21	9 , 6
Total	218	100

Table 2 shows that, Hypochromic microcytic anemia was 90.4%.

DISCUSSION

Prevalence

The prevalence of iron deficiency anemia in Kisangani pregnant women is 26%.

Our result is close to those found by Yaghoobi H *et al*. 22 .5% in Iran [13], Rehab Merza *et al*. 19.79% in Bahrain [14], and Muhammad Atif *et al*. 18.1% [15].

Moreover, the prevalence of our research is greater than those found by other authors such as Nagah Abdel AS and al. in Qatar 15.9% [16] , Okafor *et al*. 15.7% in South-South Nigeria [17], Wisal Abbas *et al*.12.1% in Sudan [18] and Ana Gomes da Costa *et al*. 10.9% in Lisbon [19].

This while, Jerlyn Apatan *et al* found a prevalence of iron deficiency anemia during pregnancy at 58% in Saudi Arabia [20] and Atta Ullah *et al*. in Pakistan had a prevalence of 63.3% [21].

The prevalence of iron deficiency anemia varies from one region to another in the world. There is high, medium and low prevalence. This disparity would be influenced by the low iron diets of pregnant women or not. These sometimes live in conditions of poverty that do not allow them to balance their diet with essential nutrients for the formation of hemoglobin useful for a smooth pregnancy. Even though pregnant women would have a balanced diet, if they live in an unsanitary environment, where several factors come into play so that they suffer from certain diseases (malaria, Ankylostomiasis) favorable to the occurrence of iron deficiency then of an iron deficiency anemia during or outside the pregnancy.

However, we notice iron deficiency anemia during pregnancy poses problem in several regions of the world. Its low prevalence would be due especially in our contexts to the lack of detecting or a regular checking of all pregnant women who received antenatal care or other reasons.

Degree and morphological type of iron deficiency anemia in pregnant women

The moderate anemia was majority with a proportion of 88.3% or 192 cases and anemia hypochromic microcytic was 90.4%. Mild anemia at 9.6% and severe anemia at 2.1%. The mean hemoglobin level was 9 ± 1.3 g / dl

Similar observations have been made by other authors such as Attah Ullah *et al* [21] in Pakistan, where they noted predominant microcytic anemia at 70.3% and an average hemoglobin at 9.06 ± 0.87 g / dl. Maleeha Manzool *et al* also found a moderate prevalence of anemia at 41% in their research [22].

Our results in relation to the morphological type of anemia are consistent with data from the literature, which often says iron deficiency anemias are most often hypochromic and microcytic [23].

However, other studies have revealed more the predominance of Mild anemia than moderate anemia sometimes an absence of severe anemia s, these authors are therefore Nagah Abdel AS *et al* [16] in Qatar with a proportion of 74.5% of mild anemia. Rehab Merza *et al* [14] in Bahrain, 90.6% of mild anemia, and M. B.Swami *et al* [24] with 48.9% prevalence of mild anemia. This difference in prevalence of degree of anemia would be explained by the definition or classification of degree of anemia that might be different from one study to another. But in all this research, we find the two major forms of anemia including moderate anemia and mild anemia. Severe anemia is poorly represented and / or absent because most often iron deficiency does not lead to severe anemia such as those caused by malaria, intestinal parasitosis and HIV. Iron deficiency anemias with insidious installation leaves to the maternal organism the time to adapt to a low iron stock.

CONCLUSION

Iron deficiency anemia in pregnant women in Kisangani town is a significant concern for all public health problems in the Democratic Republic of Congo. They remain one of the realities in gynecological-obstetrical practice in our area. Its detection and its management during and outside the pregnancy would allow to have a global idea about its prevalence and its various means of prevention.

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