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EPIDEMIOLOGICAL ASPECTS OF ANEMIA IN PREGNANT WOMEN RECEIVED IN CONSULTATION AT THE UNIVERSITY HOSPITAL CENTER OF ABOMEY-CALAVI / SO-AVA (SOUTHERN BENIN)

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ABSTRACT

Anemia in pregnant women is a public health problem in developing countries. It is one of the most common problems in obstetrics. This study aims to determine the prevalence of anemia in pregnant women and describe its etiologie. it is a descriptive and analytical study that took place in the second quarter of 2018 at the University Hospital Center of Abomey-Calavi / So-Ava Zone. All gestational antenatal care and consenting patients were included. They are subjected to a series of questionnaires relating to socio-demographic, obstetrical and nutritional characteristics. Anthropometric data were collected; blood samples were taken for blood count and malaria infection. Statistical analysis was performed using Excel 2010 and SPSS version 2.0 software. In total, 350 pregnant women were the subject of our study. Our results show that 28% of pregnant women are "short" (≤ 155 cm) and anemia affects 57% of pregnant women, 83% of whom are mild. In addition, 60% of anemic pregnant women had normochromic normocytic anemia. The anemia observed in the study field is a physiological anemia of pregnancy aggravated by a nutritional deficiency.

Key words: Benin, pregnant, normocytic and normochromic anemia, pregnancy physiology anemia, nutritional deficiency

1.INTRODUCTION

Anemia is defined as the decrease in blood hemoglobin, the threshold value of which varies according to age, sex and physiological state. It is one of the most serious public health problems on the international scene. The most common causes include iron and micronutrient deficiencies, iron malabsorption by the body, parasitic and infectious diseases (Van Den Broek et al., 1998). In pregnant women, it is reported to be below 11g / dl (WHO, 2011). Anemia is a significant risk factor for maternal and especially fetal morbidity (Merger et al., 1974). The prevalence of anemia during pregnancy varies considerably because of differences in socio-demographic and economic conditions, lifestyles and health-preserving behaviors between different cultures. The WHO reports that 41.8% of pregnant women have anemia worldwide: 17 to 31% in developed countries and 52.8 to 61.3% in sub-Saharan Africa (WHO, 2008). In Benin, 68% of pregnant women are anemic (EDSB, 2018). Studies carried out on pregnant women in some communes of

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southern Benin gave a prevalence of 65.7% in Ouidah (Koura et al, 2011) and 67.9% in Allada (Accrombessi, 2010). These globally high rates attest to the low impact of past nutrition policies. Attempts at nutritional education and promotion of iron supplementation during pregnancy had little impact on this condition.

2.1 MATERIALS AND METHODS

2.2 Type and duration of the search

This is a descriptive and analytical study that took place at the University Hospital Center of Abomey-Calavi / So-Ava(CHU-Z Ab/SA) from February 26 to May 25, 2018.

2.3 Inclusion Criteria / Exclusion Criteria

2.2.1 Inclusion Criteria

We included pregnant women who received antenatal care consenting and who agreed to perform antenatal check-ups at the CHU Z Ab / SA laboratory or at least the Blood Formula Count and the Gout Thick / Parasite Density.

2.2.2 Exclusion Criteria

All non-consenting women to participate in our study and those who performed their assessment outside the CHU - Z Ab/SA were excluded.

2.3 Sample size

The minimum sample size was calculated according to the Schwartz formula (1994), considering p = 68%, prevalence of anemia among pregnant women in Benin (EDSB, 2018).

2.4 Methodology
2.4.1Materials

After obtaining the consent of the pregnant women, anthropometric measurements (weight and height) were taken. The weight was measured using a SECA type weighing scale measuring 150 kg precision 0.1 kg and the measurement of the height using a 0.1 cm precision vertical height measurement . Pregnant women were submitted to a series of questionnaires on socio-demographic characteristics (age, occupation, educational level, marital status), food and obstetric characteristics (gestational age, parity, amount gesture). Then, blood samples were taken for the following biological tests: Blood Formula Count and Throat Drop / Parasite Density. The reactive kits used are Biolabo brand.

2.4.2 Laboratory Analyzes
Blood Formula Count

It was used the impedance variation principle where a suspension of blood in a conductive diluent causes a drop in electrical conductivity, the voltage drop is proportional to the size of the cell and these pulses are counted. This allowed to have figured elements of blood (red blood

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cells, leucocytes and thrombocytes), hemoglobin rate as well as calculation of a hematocrit, and establishment of a leukocyte formula.

Gout Thick / Parasite Density

For Plasmodium falciparum research, we performed the technique of Thick Drop / Parasitic Density. This is done in two stages: the deposition of two drops of blood and the carrying out of the blood smear according to the basic technique for the microscopic diagnosis of malaria (WHO, 2014).

2.4.3 Data Analysis

Classification of the size of the pregnant

The sizes of pregnant women collected were divided into two categories; those with a size < 1.55m characterizing the "small size" and those with a height > 1.55m characterizing the normal size (Derraik et al, 2016)

Classification of anemia

The classification of anemia was defined according to the thresholds proposed by OMS (2011) defining anemia as a hemoglobin level strictly below 11g / dl. Anemia is mild if the hemoglobin level is between 9 g / dL and 11g / dL, moderate if the Hb is 7 g / dL and 9 g / dL, and the anemia is severe if the hemoglobin level is less than 7g / dL.

The normal value of Mean Corpuscular Volume (MCV) is between 80-98% and that of Average Corpuscle Concentration in Hemoglobin (ACCH) is between 32-36 g / dL (SFH, 2010). Anemia is normocytic for a normal MCV between 80 fl - 98 fl, anemia is microcytic for a MCV less than 80 fl and anemia is macrocytic for a MCV greater than 98 fl. Hypochromia was defined by an ACCH of less than 32 g / dL and normochromia by an ACCH of 32-36 g / dL.

2.5 Statistical Analysis

The various data collected were entered and analyzed using Microsoft Office Word, Excel and SPSS software. The quantitative data were submitted to Excel to bring out the descriptive statistics. The Chi2 test of the same software was used to test the hypothesis of association between the assumed risk factors and the disease state. The threshold of significance has been set at 5% for all analysis.

2.6 Ethical Considerations

The investigation was carried out after the authorization of the managers of the Abomey-Calavi / Sô-Ava Zone University Hospital Center (CHU-Z Ab / SA) and the validation of the research protocol by the competent authorities of the structures concerned. Each pregnant woman should approve the process before being included, and the data were analysed anonymously.

3.RESULTS

In total, 350 pregnant women were the subject of our study. The average age of pregnant women in the Commune of Abomey-Calavi was 27.74 ± 5.51 years. The most represented age group is 18 to 35 years old, is 85%. Socio-demographic characteristics and obstetric / medical / dietary characteristics are reported in Tables 1 and 2 respectively. Of the 350 pregnant women, 28%

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were "short" (≤ 155 cm). Anemia affected 57% of pregnant women, 83% of whom were mild. Moreover, the typology of anemia found that 60% of pregnant women anemic had normochromic normocytic anemia, 19% normochromic microcytic anemia, 12% hypochromic normocytic anemia and 9% hypochromic microcytic anemia. It should be noted, however, that 2% of pregnant women had macrocytic anemia. There was no significant association between anemia and socio-demographic factors with the exception of education level (p = 0.000). In contrast, the factors significantly associated with the onset of anemia were gestational age (p = 0.006) and fruit / vegetable consumption (p = 0.041).

Table 1: Sociodemographic characteristics of the study population.

Sociodemographic characteristics	Anemic n= 198	No anemic n =152	P value
	Frequency (%)	Frequency (%)	
Age			
< 18 years	04	03	
18- 35 years	84	86	0,734
> 35 years	12	11	
Profession			
Craftmen	33	24	
Student	13	19	0,071
household officials	07	05	
Other	23	32	
	24	20	

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Education level No Primary Secondary University	 21 24 33 22	 16 15 36 33	 **0,000**
Marital status singles married	 18 82	 18 82	 0,668

Table 2: Obstetrical, Medical and Food Characteristics of the Study Population

Obstetrical, Médical, Foods characteristics	Anemic n=198	No anemic n= 152	P value
	Frequency (%)	Frequency (%)	
Amount gesture -first gesture -second gesture -multi gesture	 29 26 45	 34 27 39	0,451
➢ Parity nulliparous primiparous multiparous	 32 29 39	 43 25 32	 0,101

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Gestational age ➢ < 15 SA ➢ 16 - 28 SA ➢ > 28 SA	 06 33 61	 15 37 48	**0,006**
Supplémentation en fer/folâtres ➢ yes ➢ No	 97 03	 98 02	0,890
Fruit/vegetable consumption Often Sometimes Rare	 48 36 16	 60 30 10	**0 ,041**
➢ Malaria Positive Negative	 30 70	 26 74	0,473
deworming Yes No	 81 19	 75 25	0,154

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4.DISCUSSION

Sociodemographic characteristics of the study field

The average age of pregnant women in the commune of Abomey-Calavi was 27.74 ± 2.54 years. The most concerned age group was 18 to 35 years old with a rate of 85%. This corresponds to the age range recommended by WHO for being pregnant. On the other hand, those under 18 and over 35 years old are at risk of pregnancy because of their age according to Soula et al (2006). Moreover, there was no significant association (p = 0.734) between the occurrence of anemia and the different age groups in our study as in the study conducted by Taner et al. (2015) in Turkey. Also, it is not easy to see that almost all pregnant women were supposed to be married (82%). This result is in accordance with the studies conducted by Obal et al, 2016 and Békélé et al, 2016. However, no significant relationship is found between marital status and anemia (p = 0.668). In addition, more than 3/4 of pregnant women had an income-generating activity. Indeed, according to some authors (Taner et al, 2015, Békélé et al, 2016) the activity generating income of the mother is a very important variable because it impacts the monitoring of pregnancy. Also, 84% of pregnant women had at least primary level. In close relation with economic activity, the level of education is a factor significantly associated with anemia during pregnancy. In fact, the mother who does not have an adequate level of education will find it difficult to comply with medical prescriptions and recommendations, as Kalsoon (2013) has pointed out.

Nutritional status of the study population

The anthropometric evaluation of the nutritional status of pregnant women has shown that 28% of pregnant women have a "small size" (≤ 155 cm). It is an indicator of chronic nutritional deficit during childhood. According to Nikiema et al. (2010), this chronic process is most often accompanied by a micronutrient deficiency that is difficult to catch up with. This condition can have a negative impact on the progress of the pregnancy. Indeed, according to some authors, the small size of the pregnant woman increases the risk of prematurity of the child (Derraik et al., 2016). On the other hand, under-nutrition / overnutrition may affect fetal growth by reducing / increasing exchanges between mother and foetus due to inadequate placental development (Cetin et al., 2010; Cross et al. ., 2006). Moreover, this study reveals that 57% of pregnant women suffer from anemia, which is below the prevalence obtained at the national level (68%) following the Benin Health Demographic Survey carried out between 2017 and 2018 (EDSB, 2018). In addition, this prevalence is lower than those obtained in other studies conducted in Benin after which the authors found the following prevalences: 65.7% in Ouidah (Koura and al, 2011) and 67.97% in Allada (Accrombessi, 2010). Moreover, it is clearly higher than those of the studies in Cameroon and Burkina Faso, respectively 39.8% (Tchente and al., 2016) and 38.2% (Nikiema and al., 2010). These differences could be explained by the socio-economic, demographic and health characteristics of the populations surveyed in each zone. In addition, the prevalence obtained being above the threshold set (40%) by WHO (Mclean and al., 2009) allows us to qualify this anemia to a severe public health problem. The distribution of anemic hemoglobin-dependent pregnancies revealed that 83% of pregnant women had mild anemia and a very low percentage (2%) of severe anemia. These results are much better than those obtained at the national level, which indicates that severe anemia affects 5% of pregnant women (EDSB,

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2018). Indeed, below normal levels of hemoglobin, the functional consequences are enormous and the capacity for physical work is affected at this level of hemoglobin. This relationship is particularly significant when the hemoglobin concentration drops below 10g / dL.

Etiological causes of anemia

The etiological research found that 60% of pregnant women had normochromic normocytic anemia. This can be reflected either in the inability of the bone marrow to meet the need for erythrocyte production (non-regenerative normocytic anemia) and / or in extracorpullary hemolytic anemia due to the destruction of red blood cells by infectious agents such as malaria. (Regenerative anemia) according to Badham and al., (2007) and Barro and al., (2013) on the one hand, or by hemodilution usually observed during pregnancy on the other hand (Tchenté et al., 2016).

In addition, this study revealed that 21% of pregnant women had hypochromic normocytic or microcytic anemia. This could be the consequence of an iron deficiency, or an inflammatory process, or a lack of synthesis of hemoglobin in erythroblasts or finally a sideroblastosis hereditary or acquired as emphasized by Barro and al., (2013) and Touré (2012) in their studies. In any case, it would have been ideal to dose serum iron and ferritin to better identify iron deficiency anemia. In fact, iron, an essential element in the synthesis of hemoglobin, plays a determining role during pregnancy. During pregnancy, the mother needs extra iron to make the blood needed to support the developing placenta and foetus. In reality, there are three stages of iron deficiency: the first is the stage of depletion of iron stores which has no functional consequences; the second is when the reserves are exhausted and the tissues start to run out of iron, the situation leads to a deficiency. Thus, iron deficient individuals, despite not suffering directly from anemia, suffer from decreased physical capacity and decreased immunity; when the deficiency is severe, this final step proves fatal. The few cases of macrocytic anemia observed in the study population could be attributed to vitamin B deficiency in vitamin B, particularly vitamin B12 (cobalamin) and vitamin B9 (frolics) as pointed out by Scott (2007) in his study. Deficiency in these two vitamins has key health implications, especially during pregnancy, for both the mother and the unborn child. The observed normochromic microcytic anemia is probably not nutritional anemia.

5. CONCLUSION

Anemia observed in the study field is a serious public health problem. She is a physiological anemia of pregnancy caused by hemodilution accompanied by a nutritional deficiency.

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