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Prevalence of Anaemia Among Pregnant Women in Rural and Urban Areas in Zawia City

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Abstract
Anemia is one of the most common blood diseases in the world, which may cause death among mothers, and it is a pathological condition that results from a lack of red blood cells or a decrease in the level of haemoglobin from the normal rate, which leads to the inability of the blood to transport oxygen in the body. Anemia in pregnant women is a major health problem facing various countries of the world, especially developing countries, because of the harmful effects of anemia on the productive, mental, and educational capacity, in addition to the risk of premature birth and having babies who weigh less than normal and suffer from anemia. The main aim of this study was to determine the prevalence of anaemia among pregnant women in both rural and urban areas of Zawiya City, and to correlate it with the type and degree of anaemia. Among pregnant subjects of the age group 19 – 49 years, comprising 50 subjects selected from rural areas and 50 subjects from urban areas of Al-Zawiya in Libya. The haematological parameters, Hb, MCV, RBC, MCH, were investigated by Haematology Analyser - automated blood cell counter. Among the total sample of 100 pregnant women in the 19-49 years age group, the overall prevalence of anemia was observed to be 54%, with 28% in rural area pregnant women and 18% in urban area pregnant women. The results showed that in rural areas, the largest incidence of anemia was (26.1%) in the second trimester, while in urban areas it was (23.9%) in the third trimester. the majority of anaemic cases in rural study cases were (28.3%) in the age category (39-49), while in urban areas the category (19-28) was (23.9%) the most prevalent in rural areas, the degree of anemia severity was moderate anemia (43.5%), and in urban areas, was mild anemia (17.4%). Anemia is still a main health issue in pregnant women in both rural and urban areas. This study, concluded that the prevalence of anemia among pregnant women was high, and the Greater proportion of pregnant women in rural area were suffering from anemia that was moderate type than that urban pregnant woman that was mild type prevalence in rural cases was common in in 2nd trimester however in urban cases was in 3ed trimester The most prevalence anemia types were nutritional deficiency such as iron deficiency, vitamin B 12, and folate.
Keywords. Anemia, Haemoglobin, Pregnancy, Prevalence, Urban Area, Rural Area.

Introduction

Anemia is defined as a lower-than-normal number of healthy red blood cells in the blood or decrease hemoglobin level lower than normal value (normal level 12g/dl), hemoglobin is one of the main proteins in red blood cells which carries oxygen from the lung to all parts of the body, also helps get rid of carbon dioxide—resulting in poor oxygen delivery to various tissues and cells of the body. Anemia during pregnancy is one of the most common health problems that a woman suffers it, and it may lead to more complex complications if it is not treated. It is classified as mild, moderate, and severe according to hemoglobin level [1]. Anemia is a global public health problem affecting all age groups in developing and developed countries [2-3]. Among the countries with the highest prevalence of anemia in Africa and Southeast Asia, the most at-risk groups are children, pregnant and non-pregnant women. The current suggestion from the World Health Organization document showed that about 38% (32 million) of pregnant women are anemic in the world. Out of this, 46.3% (9.2 million) of them are in Africa [4]. A study conducted in Libya showed that the level of anemia was very high; it was found that 72% of pregnant women. Out of this, 66.6%, 30.5%, and 2.9% were mild, moderate, and severe anemia, respectively [5]. Among World Health Organization (WHO) regions, Africa has the highest prevalence of anemia in pregnancy (57%), followed by South-East Asia (48%) [6]. The main causes of anemia during pregnancy are nutritional deficiencies (iron, vitamin B12, and folate) and parasitic infections [7-8].

Anemia is one of the most common complications related to pregnancy. Normal physiologic changes in pregnancy affect the hemoglobin, where there is a relative or absolute reduction in hemoglobin concentration [9-10]. Since the prevalence of anemia differs from one region to another, this study is an attempt to estimate the differences in hemoglobin levels among pregnant women and evaluate the determinants of the difference in anemia prevalence in rural and urban areas. Anemia is one of the most common blood diseases, especially among women, children, and adolescents [11]. Anemia in pregnant women is a major health problem facing

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various countries of the world [12]. In addition to the risk of premature birth and having babies who weigh less than normal, and suffer of anemia. This study was conducted to assess the prevalence of anemia and identify the types, degrees of anemia among pregnant women in urban and rural areas in Zawiya City, and compare them.

Methods

Study specimen collection

Blood samples were collected from 50 pregnant women attending the obstetrics and gynecology department of Al-Zawiya teaching hospital and 50 pregnant women attending the obstetrics and gynecology department of Abu-surra village hospital, from July to September, whose ages ranged between (19-49). Their data was recorded in a questionnaire through a personal interview for each woman, which included age, address, occupation, and number of pregnancies, abortions, childbirths, and their types, and diet and her intake of nutritional supplements such as vitamin B12, folic acid, and iron.

Collection of a blood sample

5 ml of venous blood was drawn from the study cases; blood samples were collected in dry and clean tubes containing Na3EDTA as an anticoagulant substance.

Analysis of blood samples

The number of red blood cells, blood groups, hemoglobin level, hematocrit, mean erythrocyte value, mean hemoglobin in erythrocytes, and average hemoglobin concentration in erythrocyte count were determined by using an automatic hematology analyzer, Sysmex KX-21, in the laboratories of Al-Zawiya teaching hospital and Abu Surra village hospital.

Case diagnosis

Anemia was diagnosed and its types and degree were knowing according to the standards of WHO whereas the induce of anemia in pregnant women was considered when their hemoglobin level was less than 11g/100ml of blood, and anemia grades were divided into mild (Hb level 9.10-10g/100ml of blood), moderate (Hb level 7-9.10g/100ml of blood), and sever (Hb level- less than 7g/100ml of blood) [13-14]. Also, the types of anemia have been classified according to the morphology of red blood cells into Normocytic normochromic anemia (MCV=80-98, MCH≥27), Normocytic Hypochromic anemia (MCV=80-98, MCH<27), Microcytic Normochromic anemia (MCV<80, MCH≥27), Microcytic Hypochromic anemia (MCV<80, MCH<27) and Macrocytic Normochromic anemia (MCV>98, MCH≥27) Macrocytic Hypochromic anemia (MCV>98, MCH<27) [15].

Questionnaire

The data of patients was recorded in a questionnaire. Through a personal interview for each woman, which included age, address, occupation, and number of pregnancies, abortion, childbirth, and its type, and knowing the pregnant woman's diet and her intake of nutritional supplements such as Folic acid, vitamin B12, and iron, and symptoms associated with pregnancy.

Statistical analysis

To evaluate the responses of the sample study, descriptive statistics have been used to analyze the data by Statistical Packages for Social Sciences (SPSS 25), which include frequencies, percentages, and bar charts.

Results

The data shows that in a total sample of 100 cases of pregnant women, the overall prevalence of anemia was 46%, and 54% was non-anemic pregnant women, also prevalence anemia in rural pregnant women was 28% and non-anemic was 22%, prevalence anemia in urban pregnant women was 18% and non-anemic was 32%.

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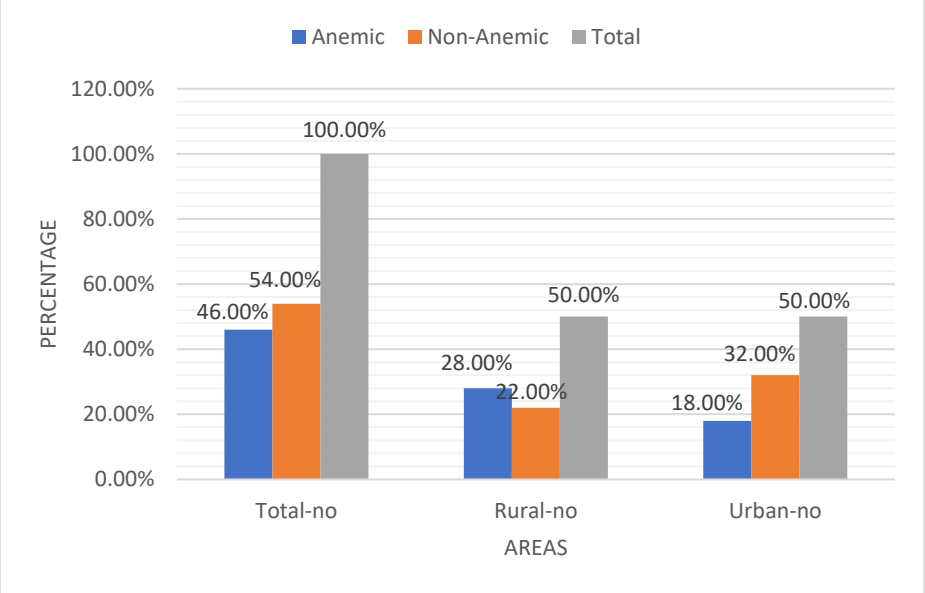

Figure 1. Distribution of anemia in total pregnant women subjects and anemia percentage in rural and urban areas according to hemoglobin concentration.

The anemic pregnant women in rural and urban areas were divided according to the stages of pregnancy to find out the prevalence of anemia according to the stages of pregnancy. The results showed that the largest incidence of anemia in pregnant women in rural areas was in the 2nd trimester of pregnancy, with a rate 26.1%, followed by a rate of 19.6% in the 3rd trimester of pregnancy, while in the 1st trimester of pregnancy was the lowest and by rate of 15.2%. On the other hand, the largest incidence of anemia in pregnant women in urban areas were in the 3rd trimester of pregnancy, at a rate of 23.9%, followed by a rate of 15.2% in the 2nd trimester of pregnancy, and no cases in the 1st trimester.

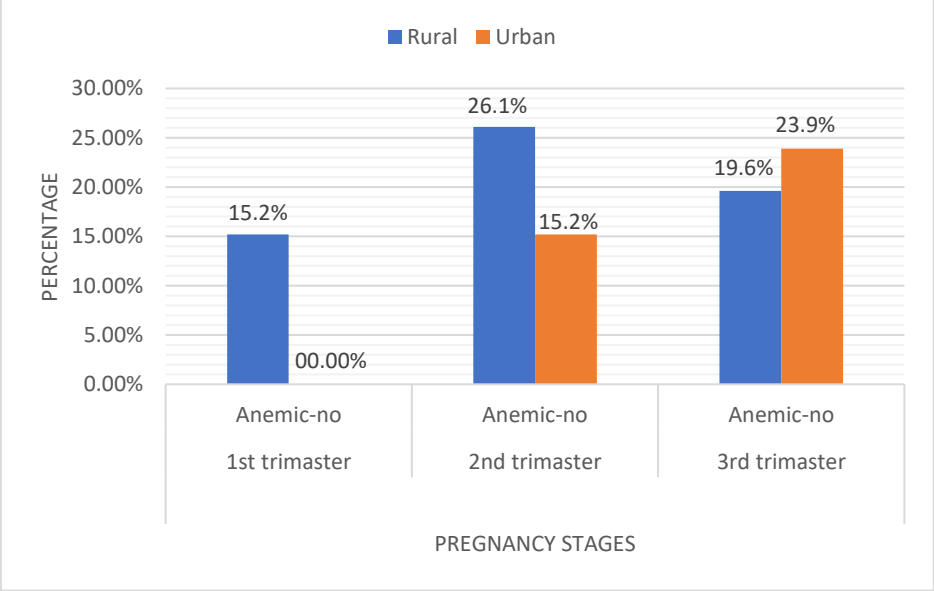

Figure 2. Prevalence of anemia among pregnant women according of stages of pregnancy.

Patient's age groups were divided into three distinct 10-year periods starting from 19 to 49 years. By analyzing the anemic cases results, we found that the majority of anemic cases in total study cases were in the category (19-28) with a percentage of 43.5%, followed by both categories (29-36) and (39-49) with a percentage of 28.3%. the majority of anemic cases in rural study cases were in the age category (39-49) with percentage of 28.3%, followed by the category (19-28) with percentage 19.6% then category (29-36) with

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percentage of 13%, while in urban areas the category (19-28) was the most prevalent and its percentage 23.9%, and the next category (29-36) and its percentage 15.2%, while we didn't find any anemic cases in the category (39-49).

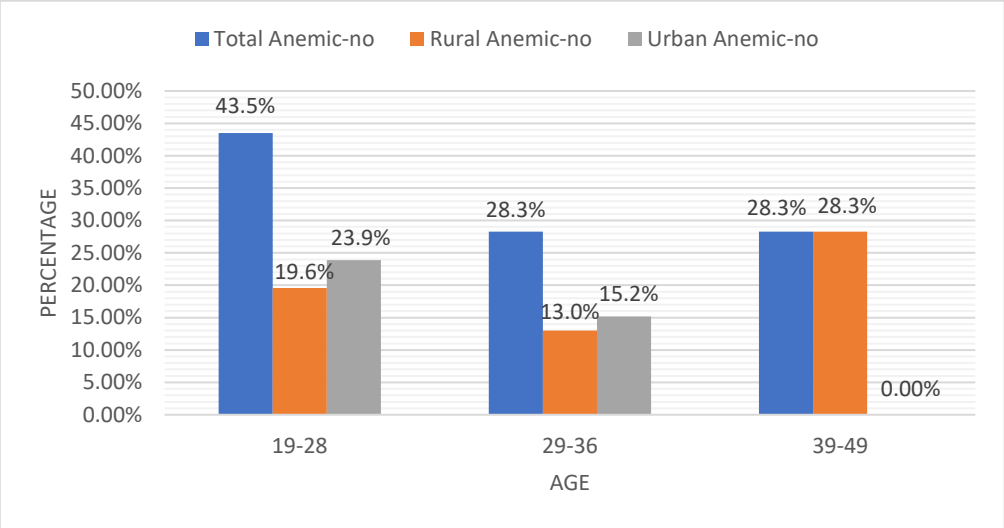

Figure 3. Distribution of anemia according to age.

Results showed that 63.2% of the total cases suffer from moderate anemia, then mild anemia with a percentage of 32.6%, and 4.3% of cases suffer from severe anemia. In rural areas, the degree of anemia severity was moderate, with a percentage of 43.5%, and mild anemia with a percentage of 15.2%, while 2.2% was severe anemia. In urban areas, the degree of anemia severity was mild with a percentage of 17.4%, and moderate anemia with a percentage of 19.6%, while 2.2% was severe anemia.

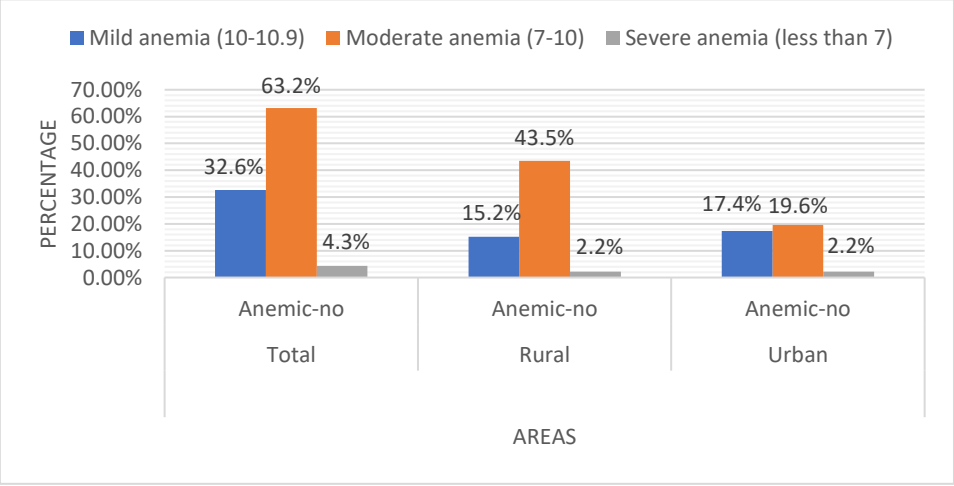

Figure 4. Degree of anemia strength among of pregnant women.

Percentage of anemia types according to size and shape the red blood cells among infected pregnant women in all anemic study cases and also in rural and urban areas were in total study cases the majority of anemia type was Microcytic hypochromic anemia with percentage of 56.5%, then Normocytic hypochromic anemia with percentage of 23.9%, then Normocytic normochromic anemia with percentage of 17.4%, then microcytic normochromic anemia with percentage of 2.2%. While in rural areas majority of anemia type was Microcytic hypochromic anemia with a percentage of 41.3%, then Normocytic hypochromic anemia, and Normocytic normochromic anemia with the same percentage of 8.7%, then Microcytic normochromic anemia with a percentage of 2.2%. While in urban areas majority of anemia types were both Normocytic hypochromic anemia, and Microcytic normochromic anemia, with a percentage of 15.2%, then Normocytic normochromic anemia, with a percentage of 8.7%.

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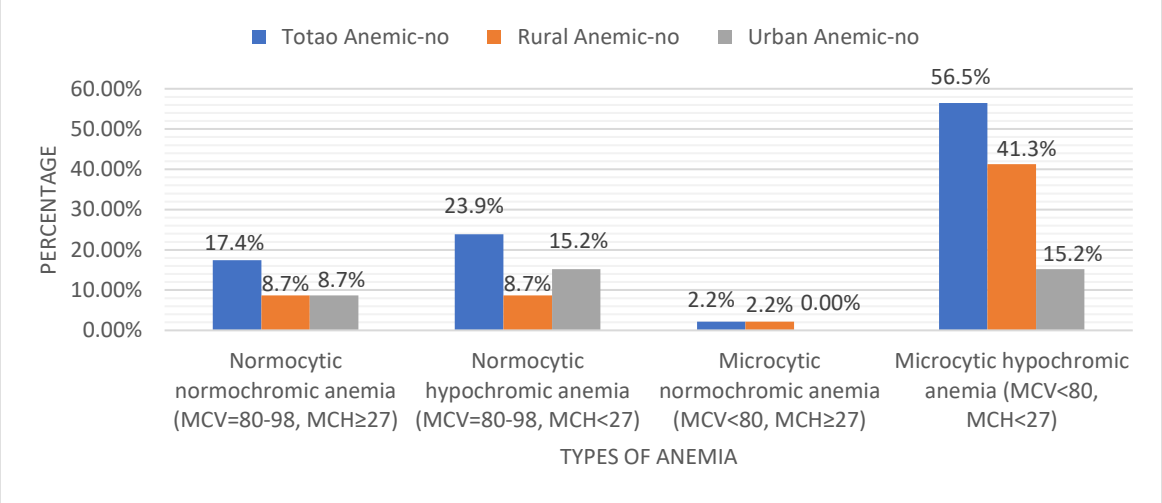

Figure 5. Types of anemia according to (MCV, MCH) in all anemic study cases and in rural and urban areas.

Discussion

The current study was conducted on 100 pregnant women whose ages ranged between 19-49 years old, and the cases were divided into two groups, 50 cases were collected from Al-zawiya central hospital that found in the city centre, which represents the urban area group, and 50 cases were collected from Abu surra village hospital, which represents the rural area group. The present study aimed to detect the prevalence of anemia and anemia types in pregnant women of rural and urban areas of Al-Zawiya in Libya. In this study, the parameters such as Hb, RBC were taken to determine blood indices, and MCV, MCH, and MCHC were used to classify anemia.

our study found that, overall prevalence of anaemia in the study subjects is present in 54% of the study population and can be classified as a severe public health problem according to WHO guidelines [14]. Anaemia prevalence was among rural cases 28% higher than among urban cases, 18%. These findings are supported by Jessica Ayensu et al 2011. Also supported by Samar A. Elalfy et al, their results were that the prevalence of anemia among pregnant women living in rural areas was 51.3% compared with 37% living in urban areas [16].

In this study sample, there was a direct correlation between gestational stages and anemia. in rural cases was the most prevalence anemia in 2nd trimester by rate 26.1%, followed by a rate of 19.6% in 3ed trimester, while in 1st trimester of pregnancy was the lowest and by rate of 15.2%, while in urban area the most prevalence anemia was in 3ed trimester of pregnancy by rate 23.9%, followed by a rate of 15.2% in 2nd trimester of pregnancy, and no cases in1st trimester of pregnancy.

The study found that the prevalence of anemia in total study cases was in the age category (19-28) by percentage of 43.5%, followed by both categories (29-36) and (39-49) by percentage of 28.3%. The study found that the prevalence of anemia in both study cases of urban and rural areas, according to the age group, was variable. They were in rural study cases in the age category (39-49) was the most prevalent with percentage of 28.3%, followed by the category (19-28) with percentage 19.6% then category (29-36) with percentage of 13%, while in urban areas the category (19-28) was the most prevalent and its percentage 23.9%, and the next category (29-36) and its percentage 15.2%, while we didn't find any anaemic cases in the category (39-49), This indicates that the prevalence of anemia is not associated with a specific age group in pregnant women.

Also, the severity of anaemia was variable according to the areas. In total anaemic cases, the highest percentage was moderate anemia by percentage of 63.2%, followed by mild anemia by percentage of 32.6%, while it was severe anaemia by 4.3%. In urban cases, the mild type of anemia was the most common type, with a percentage of 17.4%, then the moderate type with 19.6%. Results in rural areas appeared that, the percentage of moderate anemia was the highest percentage with 43.5%, then 15.2% was mild type, severe type of anemia was the lowest percentage in both rural and urban areas by 2.2%, these results are consistent with what O. Sholeye and other in their for comparative study on the prevalence of anemia in rural and urban areas of Ogun state, southwestern Nigeria, and results were 17.2% of rural participants and 12.2%

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of urban participants had moderate anemia [17], but our study differ from previous study which found mild anemia 98% among rural and 100% among urban subjects [7].
The statistical analysis of the results of this study indicates that the type of anemia is Microcytic Hypochromic anemia, 41.3%, was the most popular anemia in rural areas, then Normocytic Normochromic, and Normocytic Hypochromic, with similar rates, 8.7%, then Microcytic Normochromic anemia, 2.2%. On the other hand, the type of anemia is Microcytic Hypochromic anemia and Normocytic Hypochromic anemia types were the most popular anemia in rural areas, with a similar rate of 15.2%, then Normocytic Normochromic anemia 8.7%. Our study showed that the most common types of anemia in pregnant women were Normocytic anemia that whose common causes are inadequate dietary intake of nutrients important for red blood cells production, such as iron, vitamin B12, or folate, and Microcytic anemia that whose most common causes are iron deficiency, inflammatory diseases. This was identical to a study result of Singh, p, and others found that microcytic hypochromic anemia was 47.5%, normocytic hypochromic 32.5% [18].

Conclusion

Anemia is still a main health issue in pregnant women in both rural and urban areas. This study concluded that the prevalence of anemia among pregnant women was high, and a Greater proportion of pregnant women in rural areas were suffering from anemia that was in the 2nd trimester, moderate type, than that of urban pregnant women, that was 3rd trimester mild type anemia treatment plans for pregnant women should focus on improving diet and eating habits by including iron-rich foods and essential vitamins, along with iron and folic acid supplements.

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