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THE PRESENCE OF ANAEMIA AMONG PREGNANT WOMEN AND ITS RELATION BY THE NUTRITIONAL CONSULTATION AND THE KNOWLEDGE ABOUT THE SOURCES OF THE IRON IN EL-OBIED CITY-NORTH KORDOFAN STATE - SUDAN

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ABSTRACT

***Background**: This study was conducted at the Obstetrics and Gynecology Hospital in Elobied City - North Kordofan State, West of Sudan, in the period from December 2017 to December 2019, to detect the presence of anaemia among pregnant women, and to study the relation of the presence of anemia by consulting the doctor about the foods needed during the during the pregnancy, and by the knowledge about the sources of the iron.*

***Methods**: Systematic random sampling method was used to select 384 pregnant women. Data were collected by questionnaire, a blood samples were taken from all women chosen and analyzed by Mindray haematology analyzer to measure the hemoglobin level to detect the presence of anaemia. The data of questionnaire were analyzed by SPSS and the results presented in tables and figures showing the percentages. To find the relation between the presence of anaemia and some variables, the Chi- square test (McNemar,s test)was used. **Results:** Most pregnant women (75%) were have anemia. Most pregnant women (73.44%) have no knowledge about the sources of the iron, the majority of them (95.8%) don't consult the doctor about the types of foods needed during the pregnancy period.*

***Conclusion**: The study discovered that lack of consulting the doctor about the types of foods needed during the pregnancy period contributed to the presence of anemia with (72.7 %), and lack of knowledge about the sources of the iron contributed to the presence of anemia with (54.9%).*

KEY WORDS: *Anaemia, Pregnant Women, Nutritional Consultation, El-Obied*

INTRODUCTION

Anaemia, defined as a decreased concentration of blood hemoglobin, is one of the most common nutritional de-ficiency diseases observed globally and affects more than a quarter of the world's population [1]. Anaemia is a major cause of morbidity and mortality of pregnant women and increases the risks of foetal, neonatal and infant mortality [2] . Anaemia during pregnancy contributes to 20% of all maternal deaths [3]. Iron

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deficiency is the cause of 75% of anaemia cases during pregnancy [4,5].

Inhibitors of Iron Absorption

Inhibitors of iron absorption include: Phytates, present in cereal bran, cereal grains, high-extraction flour, legumes, nuts, and seeds; food with high inositol content; iron-binding phenolic compounds (tannins); foods that contain the most potent inhibitors resistant to the influence of enhancers include tea, coffee, cocoa, herbal infusions in general, certain spices (e.g. oregano), and some vegetables; and Calcium, particularly from milk and milk products [6].

Tidehag [7] published that the majority of phenolic compounds are of plant origin, and they are mainly found in the leaves, stems and flowers. They are reactive substances and form iron-phenolic complexes in the intestine thereby making the iron less available for absorption. Tannins are large polyphenols which can precipitate proteins. A number of foods such as coffee, tea, beans, spinach and aubergine contain such phenolic compounds. Iron in foods is either haem iron or non-haem iron [8] . Iron absorption is influenced by dietary iron content and bioavailability of dietary iron [9]. Haem iron is more efficiently absorbed than non-haem iron from the food . Bioavailability of non-haem iron is dependent on other dietary compounds. Calcium inhibits both haem and non-haem iron absorption. Tea and coffee consumption with meal inhibits the absorption of non-haem iron [8]. In addition, phytates inhibit the absorption of non-haem iron [9]. Vitamin C, fresh vegetables, fresh fruits and berries, meat, fish and poultry enhance non-haem iron absorption [8], [9]. Fruits and vegetables contain of non-haem iron and together with C vitamin the absorption of iron improves [8] . The World Health Organization [10] and UNICEF et al [11] recommend that dietary allowance of iron for pregnant and breastfeeding women is 30-60 mg per day and that of folate is 400 µg per day. Iron status can be improved by eating diverse meals and promoting better feeding practices. Meals can be diversified by increasing access to iron rich foods for example, fish, poultry and whole grains [11]. The major inorganic salts present in milk are calcium, phosphorous, sodium, potassium, magnesium chlorides and sulphates. Trace elements such as iron, copper, manganese, iodine and zinc are also present in milk. Milk is a source of calcium and a rich source of phosphorous. Both of these elements assist in the formation of bones and teeth of growing children. Since milk is deficient in iron, an exclusive milk diet may cause anemia due to iron deficiency[12].

Objectives: To detect the presence of nutritional anaemia among pregnant women. To study the relation between the presence of anemia and consulting the doctor about the foods needed during the pregnancy. To study the relation between the presence of anemia and the knowledge about the sources of the iron.

METHODOLOGY

Study type and design: descriptive- cross sectional study.

StudyArea: The study was conducted at Obstetrics and Gynecology Hospital in Elobied city, sudan. The hospital includes the departments of accidents, intensive care, laboratory, pharmacy, and antenatal care clinic (ANC).

Study population: All the pregnant women attending ante natal care clinic (ANC) at Obstetrics and Gynecology Hospital in elobied city during the study period.

Inclusion criteria : Mothers who attended antenatal care clinic (ANC) during the period from 15th August to 15th September, 2019, and who met the choosing criteria (systemic random sample) had chosen.

Sampling :

a / Sample size : The sample size was determined according to Le [13] by the following formula:

$$n = \frac{z^2 pq}{d^2}$$

Where:

n is sample size.

Z is the value of the standard normal variable corresponding to 95% level of significance (z = 1.96).

P is the prevalence of VL (p = 0.5) and (q = 1 –p) since no prior information exist.

d is a marginal error (d =0.05)

Accordingly, a sample of 384 persons was obtained.

b / SampleTechnique : The systematic random sample was used.

Data Collection Methods and tools :

In this study a structured pre-coded and close-ended questionnaire was used to collect data . Some health workers was trained to assist in filling the questionnaire. Blood samples were colected in (2.5ml).

Data analysis:

The blood samples were analyzed in the laboratory of the hospital by Mindray haematology analyzer to measure the level of hemoglobin. The cut-off points for the diagnosis of anaemia was according to the hemoglobin level as mentioned by Park (14), where A hemoglobin level of 10 to 11 g/dl has been defined as early anaemia; a level below 10 g/dl as marked anaemia.

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The data of questionnaire were analyzed by statistical package for social sciences (SPSS) . The results were presented in figures and tables showing the percentages. The relation between some variables and the the presence of anaemia was done according to Al-Qassas (15) and Le (13) by McNemar·s test (Chi- square (X^2) test) for the correlative percentages in the table (2x2) by the formula:

$$X^2 = \frac{(B - C)^2}{B + C}$$

Where: B and C are cells in the table 2x2 (without the cells of the total) as in the following shape:

A	B
C	D

The value of x^2 obtained from this formula compared with the value of x^2 obtained from the table of x^2 . The result have statistical significance when the calculated value is larger than the tabulated value under significance level (0.05). The null hypothesis is rejected at the 0.05 level when $X^2 \geq 3.84$.

Ethical Considerations

Permissions for the study was obtained prior to collect data, by contacting and receiving the approvals from the competent directors in the Obstetrics and Gynecology Hospital, also the participants women in the study had assured with that the data needed from them will be in complete confidence, and used only for scientific research purposes .

RESULTS

As illustrated in table 1, anemia was found in 75% of pregnant women (23.4% of them have marked anemia and 51.6% of them have early anemia). Table 2 shows that 26.6% of pregnant women have no knowledge about the sources of iron (20.1% of them were anaemic as in table 4). It found that 95.8% of pregnant women do not consult the doctor about the type of food needed during the pregnancy period as in table 5 and 72.7% of them were anaemic as in table 6).

Table (1):Distribution of pregnant women attending ANC in Elobeid City according to the Level of hemoglobin- December, 2019

Hemoglobin Level (g/dl)	Frequency	Percentage	Diagnosis of anaemia
5-9.9 g/dl	90	23.4%	Marked anaemia
10- 11 g/dl	198	51.6%	Early anaemia
<11 g/dl	96	25%	Normal
Total	384	100%	-

Table (2): Distribution of pregnant women attending ANC in Elobeid City according to the knowledge about the sources of iron - December, 2019

The knowledge of women about the sources of iron	Frequency	Percent
Have knowledge	102	26.6%
Have no Knowledge	282	73.4%
Total	384	100%

Table (3): Distribution of pregnant women attending ANC in Elobeid City according to the sources of iron known to the pregnant women - December, 2019

Sources of iron known to the pregnant women	Frequency	Percent
Meats	22	21.5
Dairy products	53	52
Vegetables	25	24.5
They are all true	2	2
Total	102	100%

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Table (4): The relation between presence of anemia and the Knowledge about the sources of iron among the pregnant women in Elobied city – December, 2019

The presence of anemia	The knowledge about the sources of iron		Total
	Yes	No	
Present	77(20.1%)	211 (**54.9**%)	288 (75%)
Not Present	25(6.5%)	71(18.5%)	96(25%)
Total	102(26.6%)	282(**73.4**%)	384(100%)

N = 384, **McNemar's test (X^2)** : calculated = **38.2** and tabulated = **3.84 .** Significant level = **0.05**

Table(5):Distribution of pregnant women attending ANC in Elobeid according to consulting of the doctor about the type of food needed during the pregnancy period - December, 2019

Consulting the doctor	Frequency	Percent
Yes	16	4.2
No	368	95.8
Total	384	100%

Table (6): The relation between the presence of anemia and the consulting the doctor about the food during the pregnancy period:

The presence of anemia	The consulting the doctor		Total
	Yes	No	
Present	9(2.3%)	279(72.7%)	288(75%)
Not present	7(1.8%)	89(23.2%)	96(25%)
Total	16(4.2%)	368(95.8%)	384(100%)

N = 384 , McNemar's test (X^2) : calculated = **67.5** and tabulated = **3.84 .** Significant level = **0.05**.

DISCUSSION

Table1 showed that 23.4% of the pregnant women had marked anaemia, and 51.6% of the pregnant women had early anaemia. This means anemia was found in 75% of pregnant women (as 23.4% marked anemia and 51.6% early anemia). This evaluation was according to what mentioned by Park (14): "A hemoglobin level of 10 to 11 g/dl has been defined as early anaemia; a level below 10 g/dl as marked anaemia.

As illustrated in table 2, the women who have knowledge about the sources of iron were 26.6%. Most of them (52%) as illustrated in table 3, they said that the source of iron is dairy products. This indicates that their knowledge about the sources of iron is poor, because the milk is deficient in iron as mentioned by Woldecherkos et al [12]: " Since milk is deficient in iron, an exclusive milk diet may cause anemia due to iron deficiency ".

Also it demonstrated in table **2**, there is 73.4% of the pregnant women have no

knowledge about the sources of iron, and 54.9% of them were anemic (table **4**). The results in table 4 showed that the high percentage (54.9%) of the presence of anemia belongs to the lack of knowledge about the sources of iron. The minimum percentage (20.1%) of the presence of anemia belongs to the knowledge about the sources of iron. Those results confirm that lack of the knowledge about the sources of iron increases the presence of anemia in pregnant women. This results were have statistical significance, because the calculated value of X2 was larger than the tabulated value (38.2 > 3.84) under the significance level 0.05. This results proved that lack of knowledge about the sources of iron contributes to the presence of anemia in pregnant women.

There are 95.8% of the pregnancy women do not consult the doctor about the type of food needed during the pregnancy period (table **5**), and the

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results of table **6** showed that the high percentage (72.7%) of the presence of anemia belongs to lack of consulting the doctor about the type of food needed during the pregnancy period , the minimum percentage (2.3%) of the presence of anaemia belongs to consulting the doctor about the type of food needed during the pregnancy period. Those results confirm that the consulting the doctor about the type of food needed during the pregnancy period reduces the presence of anemia, and lack of consulting the doctor about the type of food needed during the pregnancy period increases the presence of anemia.This results were have statistical significance, because the calculated value of X2 was larger than the tabulated value (67.5 > 3.84) under significance level 0.05.

CONCLUSION

The study discovered that lack of knowledge about the sources of the iron contributed to the presence of anemia with (54.9%). And lack of nutritional consultation about the types of foods needed during the pregnancy period contributed to the presence of anemia with (72.7 %). This study recommended by conducting nutritional education for pregnant women during the pregnancy period.

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