Prevalence and associated factors among pregnant woman with anemia in al-ahawra hospital Sana'a city Yemen.

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Abstract

Most pregnant women suffer from anemia disorders, which is a global health problem. These disorders contribute to increasing the severity of the disease during pregnancy for both the mother and the fetus,

Objective: To investigate the characteristics of pregnant women at Al-Thawra hospital, Sana'a Yemen.

Methodology: This study was description cross sectional study to determine the characteristics of anemia among pregnant women in Al-Thawra Hospital, Sana'a, Yemen. This study conducted a survey of 237 cases housed in the Obstetrics and Gynecology Department at Thawra Hospital, four month of (29 february-27 may 2021). This paper investigates the cause of anemia among pregnant women and compares these results with several studies conducted in other regions of the world. The SPSS statistical program was used to study and analyze the results.

Results: The results showed that the cause of the prevalence of anemia among pregnant women is due to an imbalance in the production of hemoglobin and red blood cells, due to a deficiency of iron during pregnancy. Ever had abortion 134 (56.5%). Had excessive menstrual bleeding 157 (66.2%). Had pregnancy related complication 187 (78.9%). Hemoglobin level <11 mg/dl 222 (93.7%).

Conclusion: From our study on reason for the poverty in pregnant women in Yemen was the decrease of hemoglobin in blood because of misguided drank tea and coffee behind spring of the meat and fruits, vegetables, grains and egg do not spearfish pregnancy periods, which we like complication of the pregnant , the bleeding and apportion.

Introduction

Anemia during pregnancy is a public health problem especially in developing countries and is associated with adverse outcomes in pregnancy [1]. World Health Organization (WHO) has defined anemia in pregnancy as the Hemoglobin (Hb) concentration of less than 11 g/dl [2].

Anemia is global public problem affecting both developing and developed countries with major consequences for human health as well as social and economic development. It occurs in all stages of life but it is more prevalent in pregnant women and children [3]. Anemia in pregnancy is defined as a decrease in the concentration of circulating red blood cells or in the hemoglobin concentration [hemoglobin levels of below 11 g\dl and a concomitant impaired capacity to transport oxygen [4]. Anemia is defined as low number blood cells in a routine blood test anemia is reported as a low hemoglobin or hematocrit

hemoglobin is the main protein in your red blood cells .it carries oxygen and delivers it throughout your body [5]. Iron deficiency is one of the world's most common disorders. According to the World Health Organization (WHO), globally anemia affects 1.62 billion people, which corresponds to 24.8% of the population worldwide [6]. His highest proportion of affected is in developing countries, particularly in Africa (47.5-67.6%), while the greatest number affected is in South Asia where 315 million people suffer from anemia. Anemia in pregnancy is an important public health problem worldwide. The WHO estimates that more than half of pregnant women in the world have a low hemoglobin level (<11.0 g/dl), the prevalence may, however, be as high as 61% in developing countries. During pregnancy, a balanced diet with an adequate intake of essential nutrients is important for fetal development and birth outcome, but for the mother's health. One of the micronutrients of special importance is iron. Being a vital constituent of hemoglobin,

iron is essential for blood formation and oxygen supply, and it enables various enzymatic reactions in the human body [7-9]. During gestation, iron requirements increase. Most importantly due to an increase in the red blood cell mass and growth of the unborn child and placenta and mainly during the second and third trimester. The total quantity of iron required for a singleton pregnancy is estimated to be 835 mg to provide for this, the Nutrition Societies of Germany, Austria and Switzerland (D-A-CH) recommend a daily iron intake of 30 mg for pregnant women from the second trimester of pregnancy. This amount is twice as high as the Dietary Reference Value (DRV) of iron set for the general female non-pregnant population The European Food Safety Authority (EFSA), on the other hand, considered that no additional iron is required in pregnancy because menstruation ceases and iron absorption increases significantly. during that time, and thus derived for pregnant women a DRV equal to that for non-pregnant premenopausal women of 16 mg/day According to the latest National Food Consumption Survey (NVS II) conducted in Germany in 2005–2007,non-pregnant women of reproductive age achieved a median daily iron intake of approximately 11-12 mg through normal die[10-15].

Methodology

Study design

This study is a description cross sectional study to determine the characteristics of anemia among pregnancy women in Al-Thawra Hospital, Sana'a, Yemen. The face validation was made before the study was initiated on 15 women pregnant to ensure clarity, understanding and simplicity of the questionnaire in this study.

Study location

This study was conducted in the department of obstetrics and gynecology, in Al-Thawra hospital Sana'a Yemen. Al-Thawra hospital is considered one of the main referral hospitals at the capital Sana'a, where it is the number of cases that come to more than 600 cases per day. The departments of the hospital consists of orthopedic department, Ophthalmology department, a special section for neonatal care and mothers, the surgery and caesarean section and the in section departed represented by the department of women and childbirth.

Inclusion criteria

All pregnant women with less than 11 g/dl of hemoglobin were included in this study.

Exclusion criteria

All pregnant women who have normal hemoglobin and less than 16 years have been excluded from this study.

Study duration

Data collections were conducted during the period from 29-February .until 27-May (2021), (4 months).

Sample size

237 pregnancy woman, This sample size was calculated Based on WHO (2018).

Method of data collection

After obtaining the permission from AL-Hikma University, the permission also obtained from Al-Thawra hospital to collect the data from pregnant woman from the obstetrics and gynecology Department. All anemic woman were invited to complete the in this study and invited to complete the questionnaire. Clinical data such as Hb, CBC, and (RBC–WBC–Plt–MCV-MCH–MCHC–RDW were collected from the laboratory department at AL-Thawra Hospital. We used questionnaires and asked pregnant woman face to face a group of question.

Study techniques

The questionnaire consists of three sections (General information about the participants, obstetric history characteristics Dietary factor characteristics).The questionnaire includes questions about the social characteristics of the demographic of the participant, medical history, iron supplements, folic acid, and dietary habits. Hemoglobin concentration was measured by using the SYSMEX tool. Hemoglobin concentration was recorded in the form of mg/deciliter, the women who have blood sterilization levels between 10 and 11 g/deciliter have been considered as alight poverty, and women with hemoglobin levels were considered between 7 and 9.9 g (9.9) that they are moderate and mandatory poverty.

Data analysis

Using the Statistical Package for Social Science (SPSS) single variable analysis was used to check the relationship between anemia and potential associated factor. In addition, binary logistics analyzes was used to determine the factors associated with an independent of anemia. The amended odds and 95% CI were calculated. p<0.05 is considered statistically significant; Results were as persecuted percentage, tabulation.

Ethical consideration

Permission was granted from the university and the hospital. Verbal consent was obtained from all participants and they informed that participation is voluntary.

Results

Total number of pregnant women was 237 participated in the study he age of the pregnant women is start from 16 to 46 years old. General information about the participants. 1-Most of the participant were married (94.5%).Most of the participant were Farmer (43.5%). Most of the participants were secondary (33.3%). Most of the participants were 1-4 (household size) (69.2%) (Table 1).

Table 1. *General information about the study Participant (n=237).*

(%)N	Catagerize	Variable
224 (94.5%)	Married	
12 (5.1%)	Divorced	Marital status
1 (0.4%)	Widowed	
78 (32.9%)	House wife	
103 (43.5%)	Farmer	
45 (19.0%)	Employes	Occupation
11 (4.6%)	Others	
42 (32.9%)	Diploma and above	
78 (33.3%)	Secondary	
62 (26.2%)	Primary	Level of education
54 (22.8%)	No formal education	
164 (69.2%)	01-Apr	
64 (27.5%)	05-Jul	Household size
9 (3.8%)	>=8	(Persons)

Obstetric history characteristics

Most of the participant were ever had abortion (56.5%). Most of the participant were birth interval<2 years (71.3%). Most of the participants were have ever still birth (71.7%). About of the participant were have got malaria in previous years. Most of the participant was had excessive menstrual bleeding (yes) (66.2%). Most of the participant were had pregnancy related complication (yes) (78.9%). Most of the participants were planned pregnancy (No) (53.6%). Most of the participant were hemoglobin level <11 mg/dl (95.7%). Most of the participants were second trimester (49.4%) (Table 2).

Table 2. *Obstetric history characteristics of the steady participant (n=237).*

N (%)	Categorize	Variable
45 (19.0%)	Nulliparous	Parity
152 (64.1%)	01-Apr	
39 (16.5%)	7=5	
103 (43.5%)	No	Ever had abortion
134 (56.5%)	Yes	
169 (71.3%)	<2 years	Birth interval
68 (28.7%)	>=2 years	
66 (27.8%)	No	Have ever still birth
170 (71.7%)	Yes	
144 (60.8%)	No	Have got malaria in previous year
93 (39.2%)	Yes	
79 (33.3%)	No	Had excessive menstrual bleeding
157 (66.2%)	Yes	
50 (21.1%)	No	Had pregnancy related complication
187 (78.9%)	Yes	
127 (53.6%)	No	Planned pregnancy
109 (46.0%)	Yes	
15 (6.3%)	>11 mg/dl	Hemoglobin level
222 (93.7%)	<11 mg/dl	

Hematological features

The pregnant women conducted by the study had a lake of Hb% (HGB) and HCT is where (100%). The table also shows its percentage MCV for pregnant women in this study most natural was (62.4%). Pregnant women to increase MCV it was (36.3%) follow this. In addition, a pregnant woman, which has been deficient in MCV the percentage, was at least (1.2%). From this table we note that most pregnant women had a natural MCH and a normal (57.4%). which they had an increase in MCH (7.2%). Which had a lake of accounts were equal (35.4%). The table shows that MCHC is in most of the factors that were normal by (91.1%). and formed the lowest percentage of factors with MCHC deficiency by (9.5%). We not from the table that the percentage of pregnant women who had normal RBC percentage constitutes the highest percentage and is equal to (71.8%). and which there have deficiencies were (28.2%). The table show that RDW increase the highest percentage and equal to (66.2%) and followed by the most important factors they have a natural RDW rate (12.5%). followed by the lowest percentage of factors with RDW minus (12.2%). Finally, we not from the table that the percentage of pregnant women who had normal WBC percentage constitutes the highest percentage and is equal to (58.2%). Women who have increase WBC percentage (31.0%) follow this. The lowest percentage women who have WBC deficiencies were (10.3%) (Table 3).

Table 3. *Hematological features of among pregnant women in Yemen.*

Frequency (%)	The result		Test name
0	11.5-16.5 g/dl	Normal	HGB
0	>11.5-16.5 g/dl	Increase	
237(100%)	<11.5-16.5 g/dl	Decrease	
148 (62.4%)	76.0-96.0 fl	Normal	MCV
86 (36.3%)	>76.0-96.0 fl	Increase	
3 (1.2%)	<76.0-96.0 fl	Decrease	
136 (57.4%)	27.0-32.0 pg	Normal	MCH
17 (7.2%)	>27.0-32.0 pg	Increase	
84 (35.4%)	<27.0-32.0 pg	Decrease	
216 (91.1%)	30.0-36.0 g/dl	Normal	MCHC
0	>30.0-36.0 g/dl	Increase	
21 (9.5%)	<30.0-36.0 g/dl	Decrease	
170(71.8%)	3.5-16.5.10e6/ul	Normal	RBC
0	>3.5-16.5.10e6/ul	Increase	
67(28.2%)	<3.5-16.5.10e6/ul	Decrease	
51 (21.5%)	11.5-36.0%	Normal	RDW
157 (66.2%)	>11.5-36.0%	Increase	
29 (12.2%)	<11.5-36.0%	Decrease	
138(58.2%)	4.0-11.0.10e3/ul	Normal	WBC
72(31.5%)	>4.0-11.0.10e3/ul	Increase	
27(10.3%)	<4.0-11.0.10e3/ul	Decrease	
0	37.0-47.0%	Normal	HCT
0	>37.0-47.0%	Increase	
237 (100%)	<37.0-47.0%	Decrease	

The highest number of the participates were 24-33 years old (58.6%) Following by 16-23 years old (29.5%). The lowest number of the participate more 34-45 years old (11.9%) (Figure 1).
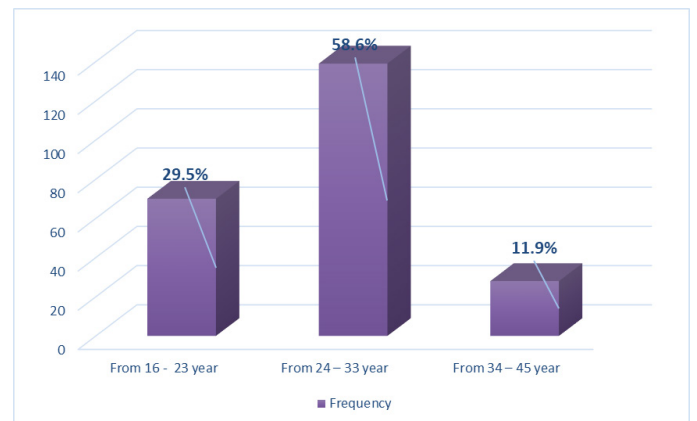

Figure 1. *Age and anaemic in pregnancy women.*

Discussion

Anemia during pregnancy is related to increased maternal and child mortality and morbidity in low-income countries. Thus, this study assessed the hematological and socio-economic factors that affect anemia during pregnancy in Yemen. Hemoglobin level among pregnant women in this study was 93.7%, this indicates that anemia among pregnant women in Yemen is a major public health problem. A Yemeni study showed that the overall prevalence of anemia among pregnant women at Safe Motherhood Specialized Hospital in Sho'ub District was 25.0%, of which of them had mild anemia, 28.2% had moderate 70-80% anemia, and only 1.04% of them had severe anemia [16-19]. Since we targeted anemia in pregnant women in our study, we

found, after analyzing the data, that there is a large percentage of pregnant women who have a hemoglobin percentage of less than 11 mg/dl and this is evidence of the high rate of anemia in Yemen among pregnant women. This is due to several reasons, including natural and physiological reasons, including nutrition and to some behaviors practiced by a pregnant woman during pregnancy.

Most of the study participants were married women accounting for 224 (94.5%), while the percentage of widows was 0.4% and the percentage of divorced women was 5.1%. Furthermore, the majority of anemic women were farmers. This explained by the living condition that they practice in their daily lives including hard work malnutrition ignorance and the lack of family planning. As for the level of education is this study, only 33.3% of the participants had secondary education. A previous study in Yemen showed similar findings that 35.4% of pregnant women had secondary education [20-22]. In this study, the group with the highest number of family member was 69.2%. Household size is important especially in a poor country like Yemen which increasing the number of families inside the single house, and the income is not sufficient to cover all the necessary needs of food and other things. This is a main reason for family members in general and pregnant mother in particular, which leads to a deficiency of iron, vitamins and minerals in the pregnant mother and their fetus.

This study showed that 64.1% of the pregnant women have 1-4 children this percentage. Other study showed that parity is still a predisposing factor in Yemen, a country of a high fertility rate (6, 5). It could be one of the sole factors for uterine rupture (27, 28, 29). This study has documented a very high parity among respondents. Only 35.1 % had 1 to children with the rest (64.9 %) having more than 5 up to 13.4. Age of women in this study ranged from 18 to 42 years, with a mean ± SD of 32.5 (± 6.5 years). Only one woman was 18, almost one half of women were between and 32 and more than half of the women were between 30 and 42 years old. Women older than 35 and women 35 having their fifth or later birth are at greatest risk for uterine rupture and the importance of fertility regulation and contraception usage could be clearly concluded [23-25].

In this study, 71.3% of women have a birth interval for 2 years or more. Globally, there should be five years as a time between the two pregnancies, to reduce the risk of pregnancy complications and other problems that the mother and fetus may face, and my study showed that most pregnant women had a time difference between the two pregnancies. Other study in regard to birth spacing, 37.02% of the women had 3–4 years birth spacing. The majority of the women had an iron and folic acid supplementation (85.9%) during their current pregnancy [26-28]. This result is consistent with the study done in Pakistan. This is due to the fact that short intervals between births may not provide women with enough time to replenish lost nutrient stores before another reproductive cycle begins [29-30].

About 66.2% of the participants had an excessive menstrual bleeding in their live. The risk of anemia in pregnant women increases due to the bleeding that a woman is exposed to from her previous menstruation, which she loses from blood and the basic components of the crisis. It is also known that the fetus feeds on the mother's blood, and this loses a large proportion of the components of the mother's blood. In this a previous study, pregnant women who had heavy menstrual blood flow before the index pregnancy were 2.6 times more likely to have a risk of developing anemia than who did not have history of heavy menstrual blood flow [31]. Other previous studies showed that having heavy menstrual flow was more likely to develop anemia the possible reason may be that heavy menstrual blood flow leads a woman to heavy blood loss, which in turn leads to anemia.

Most of the pregnant women in this study had pregnancy related complication (78.9%). Risk is increased by high blood pressure, obesity, diabetes, epilepsy, thyroid disease, heart or blood disorders, uncontrollable asthma and infection disease. Pregnancy complication that occurs during pregnancy can also pose risks. In perinatal laceration, women may had hyperemesis pravidarum, hypertension, preeclampsia, deep vein thrombosis, anemia, infections urinary incontinence and postpartum depression. But this condition may be exacerbated in cases of severe anemia or a low proportion of nutritious vitamins, which leads to a feeling of fatigue and general weakness in the body, and thus the pregnant woman becomes more vulnerable to complications that threaten her life and the life of her fetus, such as premature birth [32-35].

This study showed that there is a relationship between the spacing of pregnancy and the pre-planning of pregnancy, as most women had a spacing of pregnancies less than two years, meaning that there is no pregnancy planning. The percentage also showed us that (53.6%) of unplanned pregnancies, but there is a percentage (46.6%) of women has pre-planned pregnancy.

Most of pregnant women (72.6%) in this study ate less than three meals per day. Eating is important for the health of the expectant mother and the health of the fetus. In our research and after analyzing the data, the highest percentage of pregnant women ate less than or equal to three meals a day for several reasons, including physical condition, large number of family members, and complications during pregnancy such as nausea and vomiting. This is consists with a previous study showed that pregnant women who had meal frequency less than two times per day were 3.9 times at higher risk of developing anemia than those whose meal frequency was more than three times per day [36]. This might be because pregnancy is a special period with increased energy and nutrient requirement, which can be fulfilled with increased meal frequency.

Consuming tea/coffee immediately after food has a negative association with anemia during pregnancy. In this study 43.9% of pregnant women consumed tea or coffee before male. Tea is not only the only suspect in anemia, but coffee and soda water are shared with it, and the three drinks reduce the body's absorption of iron from food and cause difficulty in digestion, and eating it immediately after eating or with breakfast leads to severe anemia. This result is in agreement with a study done in Egypt and Ethiopia, which showed significant association between anemia and consumption of tea [37]. This could be drinking tea or coffee after food intake may affect iron absorption, which leads to inadequate dietary iron intake into the pregnant women.

In this study the most pregnant women ate fruits weekly 138 (53.2%), and the percentage of pregnant women who ate fruits per day was 41 (17.3%), and also the percentage of pregnant women who ate fruits in the month 58 (24.5%), and this is due to the economic situation. A previous study showed that 44.8% had the habit of eating fruit once [38]. Studies conducted in Pakistan and Turkey also suggested consumption of fruit two

or more times per week is associated with a decreased risk of anemia [39,40]. Poor dietary diversity leads to deficiency of minerals and vitamins, which may increase bioavailability of iron, then affects Iron status. Pregnancy is the most nutritionally demanding period in a woman's life. Therefore, pregnant women are advised to eat more diversified diet than usual.

The increased concentration of hemoglobin is with the fact that red meat is an important source of home iron. Eating eggs for the pregnant mother is necessary to eat them in order to nourish the fetus and mother together, but the maximum percentage was eating eggs per week, and this is one of the reasons that lead to anemia, other than nutrition for not eating healthy foods. Mother and to nourish the fetus. Vegetables are the most important and necessary thing for a pregnant woman's blood because they contain fiber, folic acid and essential minerals, and most of the participants who ate vegetables weekly. This study was conducted in Althawra hospital, Sana'a Yemen, further investigation is needed to assess the prevalence of anemia in rural areas that have inadequate health-care facilities and might be much affected by the war [41-44].

Conclusion

This study revealed that anemia is still a significant problem among Yemeni pregnant women, where a quarter of the studied pregnant women in the second and third trimesters were found to be anemic. The study revealed that anemia during pregnancy is significantly associated with some factors, including income statues, a short spacing between pregnancy, and present of health problem during pregnancy. Based on the findings of this study, identification of these risk factors is a valuable consideration to reduce the anemia prevalence during and after delivery. This study recommends that socioeconomic factors, which may lead to limited access to healthy food and antenatal care, contribute to most of the anemia cases and, therefore, should be recognized as the main determinants for anemia in pregnant women. It is a time for the realization that health system should focus on various factors that contribute to the occurrence of anemia and include them as important indicators in the National Health Policy.

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Competing Interests

The authors declare that they have no competing interests.

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