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Prevalence and Risk Factors of Anemia in Pregnant Women in Wasit Province, Iraq

Areej Sabah Abdulridha

Department of Obstetrics and Gynecology, College of Medicine, University of Wasit, Wasit, Iraq

Email:areejsabah@uowasit.edu.iq

Abstract

The current study was aimed for determining the prevalence of anemia in pregnant women getting prenatal treatment, and to estimate the socioeconomic and obstetric variables in totally 425 pregnant women attended to Al-Zahraa Teaching Hospital outpatient clinic during July to November (2019). Based on hemoglobin, study population were divided into non-anemic (Hb>11 g/l) and anemic groups, and further subdivided into mild, moderate, and severe at a level of 10.0-11 g/dl, 7.0–9.9 g/dL, and <7.0 g/dL, respectively. The findings revealed that the prevalence rate of anemia was 58% at a level of ≤11 gm/dl. Maximum numbers of anemic women were in the age group 20-29 years (57.1%). Most of the anemic participants (50.2%), were mildly anemic (10-10.9 g/dl), at third trimester (40.8%), and having a poor antenatal care (46.9%). As well as, 42.4% of the anemic women were received a supplement throughout pregnancy period while 57.6% does not received. The dietary habits and nutritional analysis showed that 28.6% of the study anemic participants eat fresh fruit, vegetable and meat regularly during pregnancy, whereas 49.8 % of them eat rarely.
In conclusion, the prevalence of maternal anemia in our study was higher than showed in neighboring countries. Also, there was a significant relationship between the severity of anemia and antenatal care. Therefore, regular antenatal care, iron supplementation and health education should be encouraged as national programs to reduce the number of mothers affected by anemia.

Key words: Pregnancy, Hemoglobin, Demographic, Obstetric, Severity of anemia

Introduction

Anemia is one of the most severely public health problems, which affects many individuals in many countries with great consequence to human health and socioeconomically developments. This condition can exist at any life stage but more frequent in young children and pregnant women causing negative sequale (Assefa et al., 2014; Siteti et al., 2014; Stephen et al., 2018). As described by the World Health Organization (WHO), anemia is a state of decreasing of hemoglobin (Hb) concentration for < 11 g/dl, and consider as mild, moderate and severe when the level of Hb ranged 10.0-11 g/dl, 7.0–9.9 g/dL, <7.0 g/dL, respectively (Abdul-Fatah et al., 2018). Physiologically, hemodilution in pregnant women due to increasing of plasma volume can disproportionate with the mass of RBCs to result in a moreover reduction in Hb concentration (Barroso et al., 2011). Worldwide, 38% of pregnant and 29% of non-pregnant women were

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estimated to be undergone an anemia (Reveiz et al., 2011). In developed countries, 33% to 75% of women, involving 15% of pregnant, suspected to be anemic (Stevens et al., 2013; Prasanth, 2017). In UK, 24.4% of antenatal and about a 3rd of postpartum women were considered as anemic (Rukuni et al., 2016).

During pregnancy, iron deficiency is considered as the main etiology for anemia that occure usually due to deficiencies of nutrition and / or iron (Fe) store as a result of previously gestation or previously intensive menstrual bloody losses. It showed that physiological requirement to Fe during gestation can elevate 3 times more than of non-pregnant menstruating women and this need to Fe elevates as gestation advanced (Proudfit et al., 2007; Breymann, 2015). Poor diet, multiparty, abortion, parasitic infection, excess consumptions of coffee or tea directly after meal were confirmed to be correlate with anemia in pregnant women (AL-Any, 2017; Yesuf and Agegniche, 2021). Existence of other micronutrient reductions such as vitamin A and B12, folate, riboflavin, and copper could play a role in increasing the risks of anemia (Lindström et al., 2011; Wegmüller et al., 2020).

During pregnancy, anemia appeared to cause an adverse health impact for a women and their children with increasing the chance of maternal and perinatal mortalities. This negatively maternal health impacts involved the overstress, poorly working capability, impairment in immunological functions, increasing the risks of heart attacks and death. In children, anemia can associate with increasing the risks for delivering a lowered weight baby. Also, anemia can relate to increase the risks for occurrence the intrauterine growth restriction (IUGR), low APGAR score at 5 minutes, and deaths (IUFD) (Addis Alene and Mohamed Dohe, 2014). Maternal education, maternal age (Lokare et al., 2012), parity (Ali et al., 2019), place of residence (Berhe et al., 2019), maternal occupation (Hailu et al., 2019), history of terminated pregnancy (Berhe et al., 2019), iron intake during pregnancy (Hasswane et al., 2015), unimproved source of water (Nankinga and Aguta, 2019) and marital status (Hakizimana et al., 2019) were the factors implicated with anemia during pregnancy.

Based on the database of anemia throughout 2008 to 2012, Iraq actually suffers from mild to moderate anemia among different age groups, and about 36% of Iraqi pregnant women were suspected to be anemic due to greatly nutritional deficiency (Hussien and Ali, 2018). However, health professional require for further information regarding the severity of condition and stakeholders required for prioritizing resources to control this state. Hence, the present study was aimed for determining the prevalence of anemia in pregnant women getting prenatal treatment, and for detecting its relationship to some demographic and obstetric factors.

Material and Methods

Study and data samples

A total 425 of pregnant women, involved 245 anemic and 180 normal Hb levels, were selected to this study based on their Hb values. The study population was categorized to non-anemic (Hb≥11 g/l) and anemic (Hb<11 g/l) groups, and to subdivision groups as mild (10.0-11 g/dl), moderate (7.0–9.9 g/dL), and severe (≤7.0 g/dL). The samples were collected randomly from the

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pregnant women attended for routine care to outpatient clinic at Al-Zahraa Teaching Hospital (Wasit, Iraq) during July to November (2019). Data concerned to age, education, residence, obstetrical history, and dietary habits were collected from the study population post the private agreement. Finally, 3 ml of venous blood was sampled into EDTA plastic tube. The study excluded women who did not consent

Data Processing and Analysis

All obtained data were tabled, figured and analyzed using the SPSS software. Chi-square (x^2) test was used to detect significant differences between values of study population, and the results were considered significantly different at a p-value of <0.05.

Results

Out of 425 pregnant women, the prevalence of anemia was 245 (58%), in which, Hb level was ≤11 gm/dl (Table 1).

Table (1): Prevalence of anemia among study population

Total No.	**Anemic women**	
	No.	**%**
425	245	58%

Of the study anemic participants, 132 (53.9%) were living in urban and 113 (46.1%) were living in rural area. Significant increases in anemic women were showed at the age group 20-29 years [140 (57.1%)] followed by [58 (23.7%)] were >30 years and [47 (19.2%)] in ≤20 years group. Of anemic women included in the study 48 (19.6%) were illiterate, primary and secondary educated were 120 (49%) and 77 (31.4%) were graduate (Table 2).

Table (2): Distribution of 245 anemic women among the demographic risk factors

Factor	**Group**	**Results**	
		No.	**%**
Residence	Rural area	113	46.1
	Urban area	132	53.9 *
Age	≤20 years	47	19.2
	20-29 years	140	57.1 *
	>30 years	58	23.7
Educational level	Illiterate	48	19.6
	Primary or secondary	120	49 *
	University or higher	77	31.4

Significance * (P<0.05)

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The least anemia was seen in the age group less than 20 years. Anemia was seen more in the primary and secondary educated women (44.75%) followed by university or higher educated women (36.5%) and illiterate were (11.5%). Most of anemic women [123 (50.2%)], were mildly anemic (10-10.9g/dl), 101 (41.2%) were moderately anemic (7.9-9g/dl) and 21 (8.6%) were severely anemic (< 7g/dl) according to WHO classification. Most of anemic pregnant women enrolled in the study were in third trimester 100 (40.8%) while 96 (39.2%) of them were in the second trimester and 49 (20.0%) were in third trimester. Concerning obstetrical history of the anemic women in the study 49 (20%) of them were primipara and 99 (40.4%) were multipara in whom 76 (31%) of them have been delivered normally and 72 (29.4%) have been delivered by caesarean section. Majority of anemic pregnant women included in the study had poor antenatal care 115 (46.9%), 87 (35.5%) were very poor antenatal care and 43 (17.6%) attended antenatal care center regularly, 104 (42.4%) were reported to receive Fe supplementation during current pregnancy. The dietary habits and nutritional analysis showed that 70 (28.6%) of the study anemic participants ate fresh fruit, vegetable and meat regularly during pregnancy, while 122 (49.8 %) were eat rarely. One hundred four (42.4%) of the anemic women were receiving supplement throughout pregnancy period while 141 (57.6%) of them does not received (Table 3).

Table (3): Relationship of obstetric status to results of 245 anemic women

Factor	Group	Results	
		No.	%
Severity of anemia	Mild	123	50.2 *
	Moderate	101	41.2
	Sever	21	8.6
Gestational age	First trimester	49	20
	Second trimester	96	39.2 *
	Third trimester	100	40.8 *
Parity	Nullipara	97	39.6 *
	Primipara	49	20
	Multipara	99	40.4 *
Antenatal care	Very poor control	87	35.5
	Poor control	115	46.9 *
	Good control	43	17.6
Eating of fresh fruit, vegetable and meat	Regularly	70	28.6
	Rarely	122	49.8 *
Supplement intake	Yes	104	42.4
	No	141	57.6 *

Significance * (P<0.05)

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Regarding the relation between the severity of anemia and the demographic characteristics; there is no significant relation between the severity of anemia and the resident of the included anemic pregnant women nor that with their age, while there is significant correlation between the severity of anemia and educational status of the participants. As mild anemia is reported more in primary and secondary educated women 71 (59.2%), moderate and severe anemia were more in university or higher educated participant [44 (57.1%) and 8 (10.4%), respectively], (Table 4).

Table (4): Relationship between severity of anemia and demographic characteristics

Variable		Severity of anemia			Total
		Mild	Moderate	Severe	
Address	Rural area	59 (52.2%)	41 (36.3%	13 (11.5%)	113 (100%)
	Urban area	64 (48.5%)	60 (45.5%)	8 (6.1%)	132 (100%)
Pearson Chi-Square					0.172
Educational level	Illiterate	27 (56.3%)	16 (33.3%)	5 (10.4%)	48 (100%)
	Primary or secondary	71 (59.2%)	41 (34.2%)	8 (6.7%)	120 (100%)
	University or higher	25 (32.5%)	44 (57.1%)	8 (10.4%)	77 (100%)
Pearson Chi-Square					0.005

Significance * (P<0.05)

No significant relationship were detected between the severity of anemia and gestational age that the pregnant women were presented with nor that with parity or with taking prophylactic supplement during their pregnancy period. The relation between the severity of anemia and the antenatal care that the pregnant women have been attended were significant, mild anemia was more in poorly attended antenatal care women 76 (66.1%), while moderate and severe anemia were reported more in very poorly attended antenatal care 48 (55.2%) and 11 (12.6%), respectively (Table 5).

Table (5): Relation between the severity of anemia and obstetrical characteristics

Variable		Severity of anemia			Total
		Mild	Moderate	Severe	
Gestational age	First trimester	27 (55.1%)	15 (30.6%)	7 (14.3%)	49 (100%)
	Second trimester	42 (43.8%)	44 (45.8%)	10 (10.4%)	96 (100%)
	Third trimester	54 (54%)	42 (42%)	4 (4%)	100 (100%)
Pearson Chi-Square					0.097

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Parity	Nulliparous	43 (44.3%)	44 (45.4%)	10 (10.3%)	97 (100%)
	Primiparous	22 (44.9%)	23 (46.9%)	4 (8.2%)	49 (100%)
	Multiparous	58 (58.6%)	34 (34.3%)	7 (7.1%)	99 (100%)
Chi-Square					0.301
Antenatal care	Very poor control	28 (32.2%)	48 (55.2%)	11 (12.6%)	87 (100%)
	Poor control	76 (66.1%)	31 (27%)	8 (7.0%)	115 (100%)
	Good control	19 (44.2%)	22 (51.2%)	2 (4.7%)	43 (100%)
	Pearson Chi-Square				0.000
Intake of prophylactic supplement	Yes	53 (51.0%)	43 (41.3%)	8 (7.7%)	104 (100%)
	No	70 (49.6%)	58 (41.1%)	13 (9.2%)	141 (100%)
Pearson Chi-Square					0.912

Significance * (P<0.05)

Discussion

Anemia is a common condition that affects many people. It is of particular interest to pregnant women because it has an impact on the pregnancy outcome. The findings of this study should help clinicians and public health professionals understand the scope of the problem and the factors were need to be addressed. Our data revealed that 58% of women was anemic which higher than reported nationally (36%) (Hussien and Ali, 2018), and globally (31%) (Camaschella, 2015). This elevation can attribute for the impacts of poor socioeconomic states among study individuals. However, other local studies reported that the rate of anemia was 84.84% in Iraq in 2020 (Jasim et al., 2020) which higher than our result while in Baghdad at 2012 the prevalence was (55.4%) (El Deeb et al., 2012), in Erbil was (55.5%) in 2013 (Ahmed and Mohammed-Ali, 2013) and, in Diyala province was (68.5%) in 2016 (Al-Shawi, 2019), all are almost comparable for our findings. Worldwide, rate for prevalence of anemia in pregnant women was 27.1% in Turkey (Karaoglu et al., 2010) 17% in Iran (Mardani et al., 2017), 89.6% in India (Bora et al., 2014) and 90.5% in Pakistan (Dayal and Dayal, 2014).

Significant increase of anemic women were seen at the age group 20-29 years, which was comparable to findings of other studies (Obai et al., 2016; Ayano and Amentie, 2018; Bansal et al., 2020). This can explain by a fact that reproductive-age women are greatly exposed to anemia due to frequent pregnancies and inadequate birth spacing. Education was found to be related insignificantly for maternal anemia because a time's lack. It's possible that they don't have enough time to relax and attend prenatal appointments. They commonly forget to take iron supplements. Most of the participants were mildly anemic, which was in agreement with those detected by other reports (Bekele et al., 2016; Asrie, 2017).

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In our study, most anemic pregnant women were at a third trimester, which was comparable to local study in Baghdad achieved by AL- Shawi et al. (2012), Al-Shawi (2019) as well as those studies conducted in Southern Ethiopia (Lebso et al., 2017) and India (Viveki et al., 2012). This could be because the demand for calories and nutrients increases during pregnancy for supporting elevation of maternal metabolism, bloody volume, and nutritional deliveries to fetuses with increasing demands at 2nd and 3rd trimesters.

Majority of the anemic women in the study were multipara, and higher parity as recorded in many reports locally in Baghdad (Abdul-Fatah et al., 2018) and globally in Turkey (Obai et al., 2016), and Northwest Ethiopia (Asrie, 2017). This higher rate of multiparous women could explain by the fact that these women became pregnant with reduced level of nutrition because of depletion the mother reserves during previously pregnancies and lactation periods. In contrast, Ezugwu et al. (2013) showed that no significant variation between the groups of nullliparous, multiparous, and grand multiparous. We showed that the majority of pregnant anemic was showed a poor antenatal care and does not received Fe supplementation during current pregnancy; however, significant relationship between severity of anemia and antenatal care was recorded in this study. These findings were similar to those observed in Ethiopia (Obse et al., 2013; Ayano and Amentie, 2018) and Uganda (Obai G et al., 2016) indicating that the absence of Fe supplementation can play a role in increasing the risk of anemia throughout gestation. Due to adverse effects of elemental Fe, many pregnant women redeem the Fe-folic acid supplement but do not take it as prescribed. Anemia prevalence increased as pregnancy progressed with non-compliance with iron supplementation, and non-compliant pregnant women were more likely to be anemic than compliant pregnant women, according to the findings of a research. Some of the reasons why iron supplementation programs are inefficient could be due to a lack of motivation among health professionals in peripheral health facilities to effectively distribute iron and folate supplements and improve pregnant women's compliance. Low compliance is attributable in part to the negative side effects of iron preparations.

Conclusion

The prevalence of maternal anemia in our data was 58%, which considered high compared to neighboring countries. There was significant relationship between the severity of anemia and antenatal care. Regular antenatal care, iron supplementation and health education should be encouraged as a national program to reduce the number of mothers affected by anemia.

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