Prevalence of anemia among pregnant women in their first antenatal care visit in Erbil City: A cross sectional study

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ABSTRACT

Background and objectives: Anemia is a common medical disorder during pregnancy with bad consequences on mother and fetus, this study was conducted to determine the prevalence of anemia in pregnant women and correlation of anemia with obstetrical and some demographic characters.

Methods: This study was cross sectional study was conducted in Najdi Haedar primary health care center.in Erbil city, Kurdistan region, Iraq from first of July to thirty first of December 2016.The study included 297 pregnant women in their routine first visit to antenatal care unit, aged between (16-46) years. The data collected from pregnant ladies attending antenatal care during their first visit.

Results: Mean hemoglobin (Hb) level (10.9±1.8 mg/dl) ranging from (7.5-14.3 mg/dl)

At the first booking visit in the antenatal care unit, (56.9%) were anemic. The anemic group were sub divided into mild (29.6%), moderate (17.8%) with no severe cases. There was highly significant association between anemia and parity, second trimester visitor, postpartum hemorrhage in previous pregnancy (APHPP) and very highly significant association between pregnancy and severe anemia in previous pregnancy and interval less than 2 years between current and previous pregnancy.

Conclusion: There is a high level of anemia in Najdi Haeder primary health care pregnant population, in Erbil city. The highest levels of anemia were in age group more than 40 years (63.2%), while the lowest was in less than 20 years group (41.7%). The highest level of anemia was in 2nd trimester visitors (51.3%), while the lowest was in 1st trimester group (20.0%). Regarding parity, grand multi parity were more anemic (71.4%) than others.

1. Introduction

Anemia is one of the most important issue of health problem in the world about two billion people worldwide has anemia including 700 million of them are iron deficiency type and about 50% of pregnant women in general have hemoglobin (Hb) level less than normal mean have anemia and about a hundred thousand of maternal death annually is due to iron deficiency anemia. [1].

Anemia is defined by WHO as Hb level less than 11 gm/dl in pregnant women. Anemia occurs mostly in developing country twice as developed country according to WHO.[2] .

The inducing factors for anemia are multiple, including multi parity, maternal age,low space between pregnancies (less than two years), late attending first visit to antenatal care centers for pregnancy follow up, multiple pregnancy(twin and triple) and low socioeconomic state.[3].

Malnutrition is account as one of the main factors attributed to anemia by WHO. [4].

Normally in any pregnant woman there is an increase in plasma volume to compensate for her greater circulatory need for the maternal body organ. Although there is variations in increment in plasma volume between pregnant women but minimum increase is 45% to more than double the normal volume (non pregnant).[5].

Regarding the physiological changes in pregnancy, despite the increase of plasma volume there is also increase in red cell mass but not to that level of plasma (less) so this lead to decrease Hb concentration (hemodilution), but the red blood cells (RBC) are not changed.[5].

The above changes leads to more iron demand for compensation of increased blood volume and feto-placental growth.[6].

Iron store before pregnancy is very important, any woman started pregnancy with low store of iron will show anemia in pregnancy and postpartum.So, pre pregnant supplement is better for the mother and new born child. [7].

Anemia has many signs and symptoms but unfortunately many people ignore it because sometimes it is vague features and wide range of symptoms from mild symptom to very complicated one depending on cause of anemia and severity like in iron deficiency anemia generally most people show generalized fatigue, dizziness, shortness of breath, headache, difficulty in concentration, increase heart rate, delay wound healing, pale skin, recurrent infection, decrease immunity, depression and sometimes the patient eat strange substance like paper, sand this is called pica. In severe anemia life threatening consequences occur like high output heart failar.[8].

Anemia occurs due to many factors, like some diseases which lead to blood loss, also due to Hb production defects and nutrition plays the most crucial role. Vitamins and some micronutrients like B12, riboflavin, folic acid and zinc and iron affect Hb formation.[9].

Hb level test is regarded as least expensive and usually the first diagnostic tool although it is not the most sensitive one, Serum ferritin is regarded as most sensitive indicator for iron status.[8]

Zinc protoporphyrin (ZnPP) is enter in second stage of iron production as Hb concentration is not clear cut diagnostic for anemia this indicator can be used as a more sensitive tool than Hb level test in early detection of iron deficiency anemia because in second stage of it iron in protoporphyrin is replaced by Zinc.[11]

Anemia has many bad consequences on life of pregnant women and even the fetus inside the uterus or even after delivery if not diagnosed early and treated properly [8]

Folic acid deficiency caused anemia has some effect on fetus like congenital malformation in central nervous system of fetus like neural tube defect, although there is no evidence on association between gross motor skills and folic acid deficiency, but 80% of neural tube defect decrease if folic acid supplements given to the women in preconception period of about four weeks) to eight weeks after conception [11]

As far as iron deficiency anemia is most prominent anemia in pregnancy ministry of health in Kurdistan region added routine ferofolic tab and folic acid supplement freely for all pregnant women in antenatal care routine visit, Daily dose of iron is 80 mg of elemental iron oral supplement or intravenous iron for pregnant ladies that not respond to oral or intolerant of oral supplement. [12]

Blood transfusion can be done only when there is severe anemia and there is no time to correct it in late pregnancy because of bad consequence of blood transfusion. [13]

WHO recommended 400 microgram per day of folic acid at early pregnancy till three months of age as prophylaxes, [14]

Aim of the study:
The aim of the study is to estimate the prevalence of anemia among pregnant women and try to determine the cause of it, early treatment and prevent its complication.

Material and Method
This study was cross sectional study which conducted in Najdi Haedar primary health care center, Erbil city, the capital of Kurdistan region, Iraq, from July 1st to December 31st 2016. Najdi Haedar is a big family health care center near the center of Erbil city consist of many parts (antenatal department, family planning, laboratory, ultrasound and X-ray, vaccination, child health care, dentistry, gynecology and general practitioners are found), annually about 300-350 women are visiting the antenatal care department.

The study included all pregnant women in their first visit to anti natal care unit aged between (16-46) years that were on their routine booking visit of their pregnancy. The sample size of the study was 297 pregnant women. The data collected from pregnant women visitors during the above period, the data collected contain (demographic history, past medical and family history, menstrual history, obstetrical history, parity, gestational age with monthly laboratory checkup, risk factors were already recorded in the files) The pregnant women were divided to two main groups, anemic (Hb<11 gm/dl) and non-anemic (Hb≥11gm/dl).The anemic group are sub divided in to mild anemia (Hb 10-10.9 gm/dl), moderate anemia (Hb 7-9.9 gm/dl) and severe anemia (Hb<7 gm/dl), age of pregnants classified into four groups (<20, 20-29, 30-39 and ≥ 40 years). [15]

The first visiting time was divided into three trimesters (1st from 0-13, 2nd from 14-26 and 3rd from 27-40 weeks) [16].Visitors parity is divided into (primigravida 0 parity, low multi parity 1-3 parity and grand multi parity 4-8 parity) [17].

Some risk factors for anemia in pregnancy is also studied including (antepartum and postpartum hemorrhage in previous pregnancy, antepartum hemorrhage in current pregnancy, severe anemia in previous pregnancy and less than two years spacing between previous and current pregnancy).[18,19]

 Inclusion criteria were: (all pregnant ladies in her first visit, all parity were included and all age

groups), no any pregnant women having their first visit were excluded from data entry. Ethical approval taken from manager of the center.

There are some limitations about the study like that the study is conducted in single health care center so not reflecting the whole Erbil city.

The data entry and analysis was done by using SPSS statistical program version 24 using Contingency Coefficient (a version of Chi square that deals with nominal data), P value of less than or equal to 0.05 was regarded as statistically significant, less than 0.01 was regarded as highly significant, and less than 0.001 was regarded as very highly significant else was regarded as non-significant.

Results

This study engaged 297 pregnant women in their first visit to antenatal care, mean Hb level was 10.9±1.8 ranging from (7.5-14.3 gm/dl). A hundred sixty nine of them (56.9%) were anemic and a hundred twenty eight of them (43.1%) were not anemic.

There was no severe anemia in this sample size (Hb<7 gm/dl), mild anemia was diagnosed in (29.6%) of cases while moderate anemia found in (17.8%).

The pregnant women age was between (16-46 years) with an average and standard deviation of 27.6±6.2.We have different age classes, the highest age group (20-29 years) with 166 cases (55.9%), but lowest in age group (>40 years) which account just 19 cases (6.4%), in age (<20 years) 36 case (12.1%) and in age group (30-39 years) 76 cases (25.6%).

Ninety-six of attendance were primigravid (32.3%), thirty five anemic pregnant women (24 mild and 11 moderate anemia), the remaining 61 were non anemic. Hundred sixty six were low multi parity (55.9%), eighty one were anemic (49 mild and 32 moderate anemia) and other 85 were non anemic. While, thirty five attendance were high multiparty pregnant women (11.8%), twenty five anemic (15 mild and 10 moderate anemia), the other 10 were non anemic. P-value (0.002) so parity has highly significant effect on anemia level.

Relating trimesters, thirty five of first booking visitors were in their first trimester (11.8%), 7 of them were anemic (4 mild and 3 moderate anemia), the rest 28 were non anemic. Number of Second trimester visitors was two hundred forty (80.8%), 123 were anemic (78 mild and 45 moderate anemia), the rest 117 were non anemic. Only 22 visitors were at their third trimester (7.4%), 11 were anemic (6 mild and 5 moderate anemia), the rest 11 were non anemic. P-value (0.002) so the duration of pregnancy in booking visit has highly significant effect on anemia.

Regarding antepartum hemorrhage in previous pregnancy (APHPP), only four cases had APHPP (1.35%), two of them were anemic (one had mild and the other had moderate anemia) and the other two visitors were non anemic. While ten cases had postpartum hemorrhage in previous pregnancy (PPHPP) which accounts(3.4%), nine of them were anemic (4 with mild and 5 with moderate anemia) and only one case was non anemic. P-value for APHPP in this study is (0.927) which is not significant but P-value for PPHPP is (0.000) so the effect is very highly significant.

For antepartum hemorrhage in current pregnancy (APHCP), just five cases which accounts (1.7%), two of them were anemic (one mild and the other moderate anemia) and the remaining three were non anemic. P-value (0.893) is not significant.

Severe anemia in previous pregnancy (SAPP) cases were eleven with (3.7%), all of them were anemic (2 mild and 9 moderate anemia). P-value (0.000) is highly significant.

Forty two cases, had interval less than two years between the current and past pregnancy which is about (14.1%), thirty of them were anemic (18 mild and 12 moderate anemia), the other 12 were non anemic. P-value (0.003) is highly significant.

Table 1: Association between Anemic and Non anemic Pregnant Women and Obstetrical Risks

Factors		Anemic		Non-Anemic		Total	Contengency Coefficient P-Value
		No.	%	No.	%		
Age Classes	Less than 20	15	41.7	21	58.3	36	0.149
	20-29	72	43.4	94	56.6	166	
	30-39	42	55.3	34	44.7	76	
	40 & More	12	63.2	7	36.8	19	
Total		141	47.5	156	52.5	297	
Parity Classes	PG	35	36.5	61	63.5	96	0.002
	Low Multi-Parity	81	48.8	85	51.2	166	
	Grand Multi-Parity	25	71.4	10	28.6	35	
Total		141	47.5	156	52.5	297	
Trimester	First Trimester	7	20.0	28	80.0	35	0.002
	Second Trimester	123	51.3	117	48.8	240	
	Third Trimester	11	50.0	11	50.0	22	
Total		141	47.5	156	52.5	297	
APH in previous preg	No	139	47.4	154	52.6	293	0.919
	Yes	2	50.0	2	50.0	4	
Total		141	47.5	156	52.5	297	
PPH in previous preg	No	132	46.0	155	54.0	287	0.006
	Yes	9	90.0	1	10.0	10	
Total		141	47.5	156	52.5	297	
APH in current preg	No	139	47.6	153	52.4	292	0.736
	Yes	2	40.0	3	60.0	5	
Total		141	47.5	156	52.5	297	
severe anemia in previous preg	No	130	45.5	156	54.5	286	0.000
	Yes	11	100.0	0	0.0	11	
Total		141	47.5	156	52.5	297	
interval less than 2 years from preveous preg	No	111	43.5	144	56.5	255	0.001
	Yes	30	71.4	12	28.6	42	
Total		141	47.5	156	52.5	297	

PG= primigravida
APH= antepartum hemorrhage
PPH= postpartum hemorrhage

Table 2: Severity of anemia in relation with Obstetrical factors

Factors		Moderate Anemia		Mild Anemia		Not Anemic		Total	Contengency Coefficient P-Value
		No.	%	No.	%	No.	%		
Age Classes	Less than 20	6	16.7	9	25.0	21	58.3	36	0.358
	20-29	27	16.3	45	27.1	94	56.6	166	
	30-39	17	22.4	25	32.9	34	44.7	76	
	40 & More	3	15.8	9	47.4	7	36.8	19	
Total		53	17.8	88	29.6	156	52.5	297	
Parity Classes	PG	11	11.5	24	25.0	61	63.5	96	0.009
	Low Multi-Parity	32	19.3	49	29.5	85	51.2	166	
	Grand Multi-Parity	10	28.6	15	42.9	10	28.6	35	
Total		53	17.8	88	29.6	156	52.5	297	
Trimester	First Trimester	3	8.6	4	11.4	28	80.0	35	0.014
	Second Trimester	45	18.8	78	32.5	117	48.8	240	
	Third Trimester	5	22.7	6	27.3	11	50.0	22	
Total		53	17.8	88	29.6	156	52.5	297	
APH in previous preg	No	52	17.7	87	29.7	154	52.6	293	0.927
	Yes	1	25.0	1	25.0	2	50.0	4	
Total		53	17.8	88	29.6	156	52.5	297	
PPH in previous preg	No	48	16.7	84	29.3	155	54.0	287	0.007
	Yes	5	50.0	4	40.0	1	10.0	10	
Total		53	17.8	88	29.6	156	52.5	297	
APH in current preg	No	52	17.8	87	29.8	153	52.4	292	0.893
	Yes	1	20.0	1	20.0	3	60.0	5	
Total		53	17.8	88	29.6	156	52.5	297	
severe anemia in previous preg	No	44	15.4	86	30.1	156	54.5	286	0.000
	Yes	9	81.8	2	18.2	0	0.0	11	
Total		53	17.8	88	29.6	156	52.5	297	
interval less than 2 years from preveous preg	No	41	16.1	70	27.5	144	56.5	255	0.003
	Yes	12	28.6	18	42.9	12	28.6	42	
Total		53	17.8	88	29.6	156	52.5	297	

PG= primigravida
APH= antepartum hemorrhage
PPH= postpartum hemorrhage

Discussion

Anemia is one of the most important issue of health problem in the world, especially in pregnant women because half of them in general have hemoglobin (Hb) level less than normal mean have anemia and about a hundred thousand of maternal death annually is due to iron deficiency anemia [1].

In this study anemia among pregnant women in their first antenatal care visit is 56.9%, which is corresponding to some other studies of anemia prevalence done in Erbil city (55.5%) in 2013 [15], in Jordan accounts (56.7%) in 2012, [20], in Malaysia was (57.4%) in 2012[19]. Anemic prevalence in pregnant reported in Nigeria (40.4%) in 2007[1],

while was lower in Kenya (36.2%) in 2012[6]. The prevalence of anemia in pregnancy is low USA and Europe, were it accounts (24.1% and 25.1%) in 2003. [21].

In the present study, anemia cases were 88 mild anemia cases account (29.6%) and moderate anemia 53 cases (17.8%).Comparing these results with another study in Erbil city in 2013 was (20.8 %) for mild anemia and(34.8 %) for moderate anemia [15], moderate cases at that time was lower may be due to lower economic state in current study time, The Kenyan study showed that mild anemia was (51.4%) and moderate anemia was (47.8%) in 2012 [4]. In Nigerian women there was high percentage of mild anemia (90.7%), while low percentage of moderate anemia (9.3%) in 2007 [1].

In the current study, primigravida were (36.5%) anemic, in low multi parity (48.8%), while in high multi parity was (71.4%) with high significant effect of parity on anemia in pregnancy. Comparative results have been reported in Kenya primigravida (46.4%) and in multi parity (26.8%) 2012 [4], Nigeria study in 2007 showed primigravida (33.7%),low multi parity (43.2%) and (46.5%) for high multi parity [1], this is may be due to insufficient amount of knowledge, low iron store before pregnancy and early marriage and pregnancy in young age.

Regarding the gestational age in first booking visit, in the current study there is a high significant effect of gestational age on anemia and showed 20.0%, 51.3% and 50.0% for first, second and third trimesters, respectively. This is relatively agreed with those of Nigerian and Kenyan studies related to second and third trimester. [1,6]. While the Malaysian study disagreed with this study regarding first trimester (65.4%) and second trimester (45.0%). [19].

Interval between current and last pregnancy less than two years, has very high significant effect on level of

anemia in this study and showed (43.5%) anemic in pregnancies with more than two year interval and (71.4%) anemic in pregnancies with less than two years, this is may be because there is no enough time for restore of iron level which decrease by pregnancy and delivery. The Malaysian study showed different percentage (58.3%) in less than 2 years interval and (57.1%) in more than 2 years interval between current and past pregnancy.[19]. In a study undertaken in Ethiopia in 2015, in contrast to this studies result it was showed that interval between pregnancy less 2 years was (45.4%) anemic and more than 2 years interval was (54.6%) anemic.[22].

Highest prevalence rate of anemia was (63.2%) in age more than 40 years current study with agreement in other study in Erbil city (76.92%). [15], although the age has no significant effect on anemia in the current study.

Prevalence of anemia in pregnancy may be due to noncompliance to regular ANC visit, multi parity, overcrowded of health care center with patients, poor dietary habits (inadequate animal products and drinking tea after meal), defect in knowledge of the diet which is rich in iron and vitamins like, poor knowledge in community about anemia and its preventive measures, anemia itself is mostly asymptomatic even in moderate levels also no premarital counseling for assessing anemia and iron store and no enough time between pregnancies to restore the mothers iron store for pregnancy.[15].

Recommendations: The study of anemia is important due to its consequences on the mother and the fetus but solving the problem by supplement and nutrition is very important and further studies on how to prevent anemia is recommended also to be perform in more than one center to cover whole Erbil city.

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انتشار فقر الدم بين النساء الحوامل في أول زيارة لقسم رعاية الحوامل في مدينة اربيل: الدراسة مقطع عرضي

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الملخص

الخلفية:

فقر الدم هو اضطراب طبي شائع اثناء الحمل مع نتائجه السيئة على الام والجنين. لقد اجريت هذه الدراسة لتحديد مدى انتشار فقر الدم عند النساء الحوامل و ارتباط فقر الدم مع العوامل التوليد و الديموغرافية.

الطريقة:

هذه الدراسة هي دراسة مقطعية اجريت في مركز صحي نجدي حيدر في اربيل, كوردستان العراق من الاول من شهر تموز الى الواحد و الثلاثون من شهر كانون الاول لسنة 2016.

التجربة تضمنت 297 امراة حامل في اول زيارة دورية لها لوحدة رعاية الحوامل للاعمار (16–46) سنة.

البيانات تم جمعها من السيدات الحوامل اللاتي حضرن الى قسم رعاية الحوامل خلال زيارتهم الاولى.

النتائج:

يعتبر معدل مستوى الهيموغلوبين (10,9± 1,8 غرام/ديسيليتر) تتراوح بين (7,5 –14,3غرام/ديسيليتر)

اظهرت النتائج بان (56,9%) كانوا يعانون من فقر الدم تم تقسيمهم الى ثلاث مجموعات المعتدلة (29,6%), المتوسطة (17,8%) و لم تسجل اي حالة فقر دم حادة .

كان هناك ارتباط كبيرين فقر الدم و عدد مرات الحمل للمراة و الزيارة الاولى خلال الثلث الثاني من الحمل و نزيف الدم بعد الولادة في الولادات السابقة.

هناك ارتباط كبير جدا بين الحمل و فقر الدم الحاد في الحمل السابق و المدة بين الحمل الحالي و الحمل السابق اقل من سنتين.

الاستنتاجات:

هناك نسبة عالية من فقر الدم بين الحوامل في قسم الرعاية الصحية الاولية في مركز صحي نجدي حيدر في مدينة اربيل.

اعلى مستويات فقر الدم كانت في الفئة العمرية الاكثر من 40 سنة (63,2%) بينما اقلها كانت في الفئة العمرية الاقل من 20 سنة (41,7%), و كان اعلى مستوى من فقر الدم في زوار الثلث الثاني من الحمل (51,3%) بينما اقل نسبة كان في مجموعة الثلث الاول من الحمل (20%) فقط. فيما يتعلق بعدد مرات الحمل للمراة كانت النساء اللاتي لديهن اكثر من اربعة اطفال اكثر نسبة فقر دم حوالي(71,4%).

الكلمات الرئيسية: فقر الدم, الحمل, عوامل الخطورة.