Incidence and Causes of Anemia During Pregnancy in Antenatal Words in Khartoum University Hospitals

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ABSTRACT

Background: Anemia is one of the most commonly encountered medical disorders and a significant public health problem in developing countries, particularly in pregnant women. It is a cause of serious concern, besides many other adverse effects on the mother and the fetus it contributes significantly high maternal mortality. The aims of the study were to estimate the incidence of anemia and to assess the causes of anemia during pregnancy among pregnant women in Khartoum university hospitals.

Materials and Methods: Methods: This study was a descriptive hospital based study carried out among pregnant women attending antenatal wards at Soba University Hospital, and Saad Abo Alela Hospital during 15-31/December 2015, medical and obstetric data of the study population was collected using structured questionnaire. Hemoglobin was measured and Classified according to WHO anemia definition (hemoglobin [Hb]: <11 gm/dl classified as mild anemia (Hb:10—10.9 gm/dl), moderate anemia (Hb: 7.0—9 gm/dl), severe anemia (Hb: <7 gm/dl), respectively. Data was analyzed by using SPSS.

Results: Incidence of anemia among 68 pregnant women was (33.82%) as follow: 13.24% had mild anemia, 17.65% had moderate anemia and 2.94% had severe anemia , respectively, the main cause of anemia according to result were bad life style and nutritional deficiency and infection with UTI and malaria. (47%) of these were multi gravida, 73.53% had positive pica, all study population had low and moderate socioeconomic status, 57.35% had less than two years spacing between births and 2.94% with worm infestation were associated with anemia.

Conclusions: This study showed incidence of anemia, about one third of study population and majority of anemic women had moderate type of anemia. Bad life style, nutritional deficiency, infection with UTI, malaria, low and moderate socioeconomic status, and less than two years spacing period between births were common causes. Findings of this study call for urgent attention to provide solutions for direct and indirect causes of anemia. Routine testing of pregnant women for anemia and creating awareness campaigns on factors predisposing to anemia is recommended.

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1. Introduction:

Anemia is a reduction in red blood cell volume, results in reduced capacity of the blood to carry oxygen to the vital organs of the mother and fetus, it is measured by hematocrit (Hct) or a decrease in the concentration of hemoglobin (Hgb) in the peripheral blood. Anemia is a sign of an underlying problem but does not indicate its origin (Ricci, & Kyle, 2009).

Anemia is a global public health problem, but is more prevalent in pregnant women and young children, as stated by WHO, (2015). Anemia among pregnant women worldwide was 38% and Sudan among countries, considered with a moderate type of anemia during pregnancy.

In 1992, Geneva & WHO defines anemia as Hb level below the normal range of 13.5g\dl (men), 11.5g\dl (women) and 11.0g/dl (children and pregnant women) (Geneva & WHO, 1992). CDC defines anemia in pregnant women as HB less than 11gm/dl in the first and third trimester and less than 10.5gm/dl in second trimester (CDC, 1989).

Anemia in pregnancy can be in different form as mention by Jacob, (2012). Physiological anemia of pregnancy, Pathological, Hemorrhagic, Hemolytic, Bone marrow insufficiency and

Haemoglobinopathies. But the common types of anemia are deficiency and hemorrhagic anemia (Jacob, 2012).

Anemia during pregnancy appear with clinical manifestations and signs and symptoms may be mistaken as minor disorders of pregnancy, patient may complain of weakness, exhaustion and lassitude, headache, nausea, vomiting, diarrhea, indigestion and loss of appetite, weight loss, depression, palpitation, dyspnea, giddiness, edema and, rarely, congestive cardiac failure can occur in severe cases, and sometimes with signs of pallor, glossitis, stomatitis, ulceration in mouth and tongue, edema due to hypoproteinemia, and hemorrhagic patches under the skin and conjunctiva (Sharma, & Shankar, 2010).

All pregnant women are at risk for becoming anemic, but the risk is higher in women with morning sickness, teenager, poor nutrition, history of anemia before pregnancy, women of childbearing age, frequent blood donors, vegetarians, hemolysis, pica (consuming nonfood substances), multiple gestation, and limited intervals between pregnancies (Jacob, 2012). In addition, Malaria increase severity of anemia mainly among primigravidae living in endemic areas (Matteelli et al., 1994). Serious impact of anemia on the health of the maternal and fetus depend on severity, speed of onset of anemia and degree to which oxygen is diminished, leading to miscarriages, preterm delivery, perinatal mortality, postpartum depression, preeclampsia, eclampsia increases the risks of hemorrhage, infection and the most common effect on the fetus are risk of preterm deliveries, low birth weights, morbidity and perinatal mortality from the impairment of oxygen delivery to placenta (Ricci, & Kyle, 2009).

Study conducted in eastern Sudan reported that 62% of the pregnant women had anemia (Hb < 11 g/dl), 52.4% had mild anemia; 8.1% had moderate anemia and 2.2% had severe anemia, respectively (Adam et al., 2005).

By determining incidence and causes of anemia among pregnant women better management approach can be recommended to help in prevention. Therefore, the main aims of this study were to study incidence, risk factors and causes of anemia among pregnant women admitted to antenatal wards in Soba University Hospital, and Saad Abo Alela Hospital.

2. Materials and Methods:

A descriptive hospital based study carried out randomly, among 68 pregnant women admitted to antenatal wards at Soba and Saad Abo Alela Hospital during 15-31/December 2015, data was collected using structured questionnaire. Hemoglobin was measured, according to Geneva & WHO, anemia definition as hemoglobin [Hb]: <11 gm/dl and classified to mild anemia (Hb:10—10.9 gm/dl), moderate anemia (Hb: 7.0—9 gm/dl), severe anemia (Hb: <7 gm/dl) and <4 g/dl (very severe anemia) Respectively.

Data was analyzed by using SPSS. Descriptive statistics were computed for all relevant variables. Association between anemia and some risk factors in pregnancy was tested using chi-square and multivariate analysis of risk factors was done. Permission from participants was taken.

3. Results and Findings:

Most of the study population age was between 20-40 years (80%), 42.65% of them, their level of education was university, two third of them, were housewives lived in urban area (77.94%, 69.12%) respectively, and 41.2% of them, have low Socioeconomic Status (Table 1).

Table 1. *Demographic Data of the participants.*

Age	Frequency	Percentage
Less than 20	11	16.18
20-30	32	47.06
31-40	23	33.82
41-50	2	2.94
Education		
Illiterate	3	4.41
Primary	14	20.59
Secondary	22	32.35
University	29	42.65
Occupation		
Employee	15	22.06
House wife	53	77.94
Residence		
Urban	47	69.12
Rural	21	30.88
Socioeconomic Status		
Low	28	41.2
Moderate	40	58.8

According to Geneva, & WHO classification, anemia experience among study population was 33.82%. Mild, moderate and sever as follow (13.24 %, 17.65% and 2.93%), respectively (Table 2).

Table 2. *Hb level among study population*.

HB level /gram	**Frequency**	**%**
11 and more	45	66.18
10-10.9	9	13.24
7-9.9	12	17.65
Less than 7	2	2.93
Total	68	100

Obstetric information of the study population, majority of them in the third trimester 58.8%, and

25% have an experience to one or two abortion with lack of preconception care, and Folic acid 7.4% and 5.9% respectively, and history of anemia found in 23.5% of pregnant women (Table 3).

Table 3. *Obstetric information of study population*

Items	%
Gravity (number of pregnancies):	
One	44.1
2-5	47.1
6-9	8.8
Parity (number of deliveries):	
One	11.8
2-5	36.8
6-9	7.4
History of abortion	
1-2	25
3-4	2.9
Type of pregnancies:	
Single	94.1
Twins	5.9
Pregnancy trimester	
First	13.2
Second	27.9
third	58.8
Space between children	
Less than one	22.1
Less than2	35.3
2and more	17.7
Antenatal care	
Regular	77.9
Preconception care	7.4
Folic acid	5.9
Hb regularly	75
History of anemia	23.5
History of malaria	7.4

Health problems that pregnant women suffer from it were UTI 38.3%, malaria 22.1%, bleeding 14.7%, hyperemesis 5.9%, vomiting 36.8%, and 73.53 experience pica (Table 4).

Table 4. *Health problem and pica among study population.*

Health problem	Frequency	%
UTI	26	38.3
Malaria	15	22.1
Worm	2	2.9
Vomiting	25	36.8
Diarrhea	2	2.9
Bleeding	10	14.7
Hyperemesis	4	5.9
Pica experience	50	73.53

The mean of pregnant women regarding their knowledge about anemia during pregnancy was 55.1%, percentages were as follow: their knowledge about definition of anemia was 82.4%, signs and symptoms was 54.41%, their knowledge about common types of anemia, risk of pregnant women to develop anemia and prevention of anemia during pregnancy was 32.35%, 85.3%, and 21.1% respectively (Table 5).

Table 5. *Pregnant women level of knowledge about anemia during pregnancy*

Knowledge about	Frequency	%
Definition of anemia	56	82.4%
signs and symptoms of anemia	37	54.41%
The most common type of anemia during pregnancy	22	32.35%
Pregnant women risk to develop anemia during pregnancy	58	85.3%
Prevention of anemia during pregnancy	14	21.1
Mean		**55.1**

In this study, no significant association between HB% and educational level, type of pregnancy, abortion and trimester of pregnancy.

4. Discussion:

Incidence of anemia in the current study was with HB% below 11g/dl, was (33.82%) which may be due to lack for seeking preconception care, take folic acid and antenatal advice. but it was less than what reported in El-Khurma Province in western Saudi Arabia, other studies in sudan, Baghdad Province, and Nigeria, they found that anemia in pregnant was 68.8%, 62.6%, 39.94%, 55.4%, 54.5% and, 40.8% respectively (Gedefaw, 2015; Abu Zaida et al., 2014; Adam et al., 2005; Al-Shawi et al., 2012; Olatunbosun et al., 2014; Abdelgadir,2012).

Anemia found in the current study higher than that reported in Southeast Ethiopia (27.9%) (Kefiyalew et al., 2014), and in north west Ethiopia were (21.6% and, 16.6%) respectively (Melku et al., 2014; Alem, 2013). In Turkey 2003-2004 was (27.1%) (Karaoglu et al., 2010), in Iran 2005-2007 was (4.7%) (Mirzaie, 2012), and Northern Nigeria 2009 was (17%) (Nwizu et al., 2011). This might be due to difference in the socio-demographic factors and lack of enough spacing period between children.

Anemia among pregnant women in this study was varied 13.24% had mild anemia, 17.65% had moderate anemia and 2.92% had severe anemia, this result agrees with (Gedefaw, 2015) in Southern Ethiopia, and in Western Saudi Arabia, findings

indicate that moderate anemia is more common 60% and 73.7% respectively (Abu Zaida et al., 2014). In contrast, in southeast and northwest Ethiopia 2013, in eastern sudan and Nigeria, they found that mild anemia is more common (55%, 64%, 52.4%, and 61%) respectively followed by other types of anemia (Kefiyalew et al., 2014; Olatunbosun et al, 2014; Adam et al., 2005).

Current study found that health problems among women as risk factors of anemia were UTI, multigravida, Malaria, bleeding and pica which agree with a study done by Adam et al. (2005), in eastern Sudan, who found that grand multigravida. Malaria and pica are the most common risk factor of anemia (Adam et al., 2005).

Malaria infection during pregnancy is life-threatening, in the current study, about 22.1% had malaria, with history of 7.4% had malaria in their previous pregnancies which might have contributed to the high prevalence of anemia as shown in eastern Sudan 13.7% (Adam et al., 2005). In Ethiopia Alem (2013) reports anemia was significantly associated with history of malaria attack (Alem, 2013).

Infection with malaria and UTI in the current study relatively high, this agree with a study done in Southeast Ethiopia (Kefiyalew et al., 2014). In addition, in the current study, 41.18% of a low socioeconomic status found among study population, which make them liable to acquired anemia as justify by Melku et al., (2014), who stated that mothers who have low monthly family income were three times more likely to be anemic as compared to those with high monthly family income, as income is low, the expenditure for food becomes low (Melku et al., 2014).

In the current study, Findings indicate that Interval between births less than one year found among 22.1% of participants, this lead to exhausted mothers, depleted iron and reduce Hb%. In addition, women did not have enough amount of nutritive diet, this could lead to anemia, beside 73.53% of study population had pica (non-nutritive food), which interfere with the absorption of iron and multivitamins, which lead to anemia, this result is agree with (Salih et al., 2015), who found pica is 67.3% among the pregnant women, and was higher than what reported by (Adam et al., 2005), in eastern Sudan 2003-2004, Adam et al. found (13.7%) practicing pica, which was significantly associated with anemia (Adam et al., 2005).

Half of the pregnant women their knowledge about anemia during pregnancy was good but their knowledge about prevention was only 21%, this make them liable to anemia.

Conclusion

Anemia is still a major health problem worldwide, and in Sudan. One third of the study population had different types of anemia but moderate was dominant. Infection with malaria and UTI, low socioeconomic, multigravida, pica, inadequate period between pregnancy, bad life style, and nutrition deficiency were existed among participants. Good knowledge level about anemia was found, but knowledge about prevention was poor. Findings of the current study call for urgent attention to provide solutions for direct and indirect causes of anemia. Routine testing of pregnant women for anemia and creating awareness campaigns on factors predisposing to anemia is recommended

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