Prevalence of Anemia and Risk Factors Among Pregnant Mothers Attending Antenatal Care at Jimma University Specialized Hospital, South-West Ethiopia

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Abstract

Background: Anemia is one of the most frequently observed nutritional deficiency diseases in the world today .It is especially prevalent in the women of reproductive age , particularly during pregnancy when it is contributing for maternal death. The diagnosis is made by clinical examination and investigation for hemoglobin or Hematocrite level .Depending on the hemoglobin level, anemia categorized as moderate and severe which is important for management. **Objective:** The main objective of this study was to determine the prevalence of anemia and associated risk factors among pregnant women attending antenatal care clinic at Jimma University Specialized Hospital from February to June, 2018 **Methods:** institutional based cross-sectional study was employed to assess the presence of anemia in all pregnant women attending antenatal care clinic of Jimma University Specialized Hospital. Finally collected data was analyzed by using SPSS. Depending on the clinical manifestation, assessing associated factors, laboratory determination of hemoglobin level and stool examination, the result were summarized by using tables and chi-square. **Results**: A total of 207 mothers were seen during the study period with 100% response rate Among the study population65(31.4%) had anemia with a mean hemoglobin level of 11.4gm/dl and 9.6gm/dl for   the total and anemic mothers respectively Regarding age 105(50.7%) of the study population were in the age group of 18-25 ,88(42.5%) were in the age group of 26-35 and 7(3.4%) of the study population were in the age group of <18 year and >35 years. 124 (59.9%) of the study population were living in urban,40.6% of the of the study population had attended secondary school and above. Anemia had a significant association (P<0.05) with hook worm infestation, chronic illness, parity and age of pregnant mothers. **Conclusion**: the result of this study showed that the occurrence of anemia in pregnancy has been present in large population of pregnant women. The rate of anemia being higher among grand multiparas, in third trimester of pregnancy and age more than 35 years and in mothers who had chronic illnesses. **Key words:** Anemia, pregnant, ANC, JUSH

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Introduction

Anemia in pregnancy is defined when the distribution of hemoglobin (Hgb) level is below the fifth percentile. The cut off value varies by trimesters of pregnancy. Anemia is said to be present if Hgb level is less than 11gm/dl or hematocrite (Hct) is <33% in the first trimester and third trimester, and less than 10.5gm/dl (HCt<32%) in the second trimester.

Maternal Hgb below 6 gm/dl has been associated with reduced amniotic fluid volume, fetal cerebral vasodilatation and non re assuring fetal heart rate patterns. Increased risk of prematurity, Spontaneous abortion, LBW, and fetal death has also been reported. In addition, severe anemia (Hgb<7gm/dl) increases the risk of maternal mortality (1).

Anemia is one of the major public health problems affecting all ages of population with its highest prevalence among under five year of age and pregnant women. Globally anemia affect 1.62 billion people (25%), among which 56 million are pregnant women (2,3).

Globally anemia contributes to 20% of all maternal death and it is one of the most intractable public health problem in developing countries (3,4). Anemia in pregnancy is a major health problem in tropical countries, because it is extremely common and is strongly associated with maternal and fetal morbidity and mortality. Severe anemia can lead to cardiac failure in pregnancy, while lesser grades of severity are associated with decreased maternal well-being and contributes to maternal death from the hemorrhage or infection. Anemia also contributes to prenatal morbidity and mortality by increasing the likelihood of intrauterine growth retardation or preterm delivery (5).

Ethiopia is one of the countries where there is high level of anemia among women of reproductive age (15-49) and pregnant women. According to the 2011 Ethiopian Demographic and Health Survey (EDHS) 17% Of Ethiopian women age 15-49 are anemic, with 13%have mild anemia,3% having moderate anemia&1% have severe anemia(6)

The main risk factors for anemia are low intake of iron contain foods, poor absorption of iron from diet,

increase requirement of iron and foliate during pregnancy, as well as infections like malaria, HIV and hook worm (7,8) . In light of this deficit the need of conducting this study is to determine the prevalence of anemia in women following antenatal care (ANC) and to identify the major associated factors, which potentially place pregnant women at high risk of acquiring anemia.

Methods and materials
Study area and period
The study   was conducted in JUSH which is located at Jimma town. Jimma town is located in Oromia region, 346 km south west of the capital city of Ethiopia, Addis Ababa. JUSH is a teaching hospital and it is the only referral hospital in the south-western region of the country. The hospitals have four major, minor departments and follow up clinics. The gynecological and obstetrics department is one of the major departments in JUSH which has gynecology ward, maternity ward and labor ward. It also has two OPDs, one gynecology OPD and MCH clinic. Pregnant women are follows ANC follow up at MCH clinic.

MCH clinic gives different services like screening of anemia and nutritional status. It also gives therapeutic and preventive iron sulphate and foliate for pregnant women. The data collection was carried out from April 15-30, 2018 G.C.

Study Design
Institutional based cross-sectional study was conducted among pregnant mothers attending antenatal care clinic of Jimma University specialized hospital.

Study Participants
Source population: All pregnant women attending antenatal care clinic in Jimma University Specialized Hospital.
Study population: All clinically anemic pregnant women attending antenatal clinic during data collection period of Jimma University Specialized Hospital.

Sample size and sampling technique
The Sample size was calculated by using single population proportion formulas as follows:-
ni= $(Z\alpha/_2)^2$ P (1-p) /d^2 by using 29 % prevalence of anemia (9) , 95% confidence interval,5% margin of error and 10% non-response rate the final sample size was 207.

Sampling technique
Convenience sampling technique of every pregnant women attending MCH clinic during the period was used.

Data collection instruments and technique
Data were collected through face-to-face interview using pre-tested structured questionnaire. Physical examination and laboratory investigation were done. The hemoglobin level was determined by using CBC machine. Laboratory results were collected and registered properly. The external consistency was checked with different experts.

Data Analysis:
After data collection, Data were first checked manually for completeness and then coded and entered in to EpiData version 3.1. The entered data were transferred to SPSS version 20 for further processing. The data were cleaned by visualizing, calculating frequencies and sorting. The data were analyzed by using SPSS version 20 statistical software. Frequencies and proportions were computed for description of the study population in relation to relevant variables
Data quality assurance: To assure the quality of data properly, designed data collection tools were prepared before beginning of the actual data collection process. the questionnaire were translated to local language(Afan Oromo and Amharic) and then back to English to evaluate the correctness of the translation by expert who can speak both languages fluently. The questionnaire were pretested and the aim was to determine if any problem and difficulty in responding to the questions and check the questionnaire quality and if found to be corrected. Closed supervision was carried out by principal investigator.

Ethical consideration
Prior to data collection an official written letter from Jimma University was taken and submitted to the responsible hospital director. Subjects were informed about the objective of the study and verbal consent was made with the right not to participate in the study. Honesty and confidentiality were maintained throughout the study.

Results
A total of 207 mothers were seen during the study period with hundred percent response rates. Regarding age

105(50.7%) of the study population were in the age group of 18-25. 88(42.5%) of study population were in age group of 26-35 while7 (3.4%) and 7(3.4%) of the study population were in the age group of <18 and >35 respectively .124(59.9%) of the study population were living in the urban area. The rest 83 (40.1%) of the study population were living in rural area

Majority of attendants live in low socioeconomic status (<1000) which is 157(76.8%) and only 4(1.9%) have economic status of more than 2000 birr per month. 91((44%) of attendants have children 1 and2 but only 8(3.9%) have children more than five.

From age 105(50.7%) of the study population were in the age group of 18-25 of which 27 (25.7%) of them were anemic 88(42.5%) of study population were in age group of 26-35 while 32(36.3%) and 7(3.4%) of the study population were in the age group of <18 and >35 respectively 5 (71.4%) were anemic in age group of >35 years (p=0.03).

The prevalence of anemia increases with previous history of malarial attack compared with those having no attack of malaria. Out of 68 mothers who had malaria attack in the past 1 year,25(36.8%)were anemic while out of 139 mothers who didn't have previous attack of malaria only 40(28.8%) were anemic.(P=0.024).

The occurrence of anemia increases with parity. 62.5% of grand multiparas in the study population   were anemic while 47(34.5%) of mothers who were from Para I- IV were anemic and 62(30%) were primigravida of which 13(21%) were anemic. (p=0.032).   66% of mothers visited antenatal clinic in the second and third trimester of their pregnancy and 24% visited in their first trimester of pregnancy. The prevalence of anemia was 30.6% and 36% in the second and third trimester, respectively. 11(24%) of those in the first trimester were anemic.(p=0.345).

According to the World Bank classification of Growth National income all the mothers tested during the study period were in low socio economic status, out of these 159(76.8%)of the mothers have monthly income of <1000birr) of which32.1%were anemic. Only 4(1.9%) have income >2000 birr. 105 (50.7%) of the study population had history of contraceptive use out of which 27(25.7%) were anemic.(p=0.071)

Among the study population 31.4% had anemia with a mean hemoglobin level of 11.4gm/dl and 9.6gm/dl for the total and anemic mothers respectively. Out of the anemic mothers 25 (46.6%) were found to have moderate anemia and 5(9.3%) had severe anemia. The rate of anemia was 16.7% and 3.3% for the rural and urban, respectively.

Discussion

This study showed that the prevalence of anemia in pregnancy was 31.4% among the 207 attendant mothers. The prevalence was comparable with 27.2% study done in Tanzania (10). The prevalence was lower than previous study done at JUSH MCH clinic which was 38.2% (4). The reason may be in this study convenience sampling technique was used to select the attendants and they were tested at different visits. The prevalence of anemia in this study is higher than study done in Uganda (15.3%). The difference may be attributed to advancements in the quality of ANC and living conditions in Uganda. (11).

High parity increases the risk of hemorrhage through intermediaries such as increased venous drainage to the lower part of uterus, hyalinization of the blood vessels and decreased elasticity of the uterine wall. (10) When these iron reserves are already low due to malnutrition, frequent pregnancies, malarial attack and hookworm, the severity of anemia is marked. High rates of anemia in pregnancy among primiparas were commonly found to be associated with adolescence and smoking. (11)

In one study done in university of Nigeria Teaching Hospital to determine the prevalence and risk factors for maternal anemia and the effect of HIV infection on severity of maternal anemia, the prevalence of overall anemia during pregnancy was 40.4%. The majority 90.7% of these anemic women were mildly anemic (Hgb=9-10gm/dl) where as 9.3% were moderately anemic (Hgb= 7-8.9g/dl). The HIV status of 530 cases was done and 27 of the cases were positive for HIV infection out of which 20 (74%) of mothers were anemic (12)

In this study, even though the serostats screening was not done, on historical background, 5 out of 207 mothers were positive for HIV. Out of these positive for HIV, 60% were anemic. The relative risk of sero positivity increased with severity of anemia, thus significant association was found between degree of anemia and HIV serostats among the study women with anemia.

Anemia had a significant association (p< 0.05) with age, hookworm infestation, chronic illness and parity. This is because most illiterate mothers are did not know how to use family planning, from where family planning service given and some of them may think family planning method as harm full. Thus will have more blood loss during delivery and there will be no time to restore already depleted iron stores and hence anemia results.

Conclusion

Result of this study showed that the occurrence of anemia in pregnancy has been present in large proportion of pregnant women. The rate of anemia being higher among grand multi para in third trimester of pregnancy, in mothers who had chronic illnesses, mothers whose age above five. For pregnant women anemia can result in severe

morbidity and reduces the resistance of blood loss with the result that death may result from the blood loss associated with normal delivery.

Acknowledgment

Competing interest

The authors declare that they have no competing interests.

References

1. CDC; 2010.pedatric and pregnancy Nutrition surveillance.
2. WHO/CDC, worldwide prevalence of anemia 1993-2005:WHO Database,WHO Press,Geneva,Switzerland,2008
3. Balarajan,U.Ramakrishana,E.Ozaltian, A.H.Shankarand S.V.Subramanian "anemia in low income and middle income countries "The lancet,vol.378,no9809 pp 2123-2135, 2011
4. Belachew T, Legesse Y. Risk factors for Anemia among pregnant women attending ANC at JUSH, south western Ethiopia. Ethio-Med-J2006Jul, 44(3):211-20
5. Christensen, RD. and Ohls, RK. Anaemias Unique to Pregnancy and the Prenatal Period.in: N.J,Rodgers,G.M., Paraskeyas.F.and Glader,B., Wintrobe clinical Hematology.Vol.2,11th Edition, Lippincott Williams and Wilkins,USA,1467-1486
6. Central Statistical Agency [Ethiopia], ICF International. 2012. Ethiopia Demographic and Health Survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ICF International 2012.
7. Johan W.ADMESON/Dan L.Lang S 1998 Anemia In Harrison principle of medicine 14 edition.
8. Harton JJ Ras.2003.The economics of deficiency available bank bray resource Journals . food policy,28:51-75
9. Eyasu Ejeta,Birhan Alemnew,Ashetu Fikadu,Fikadu,Merga Fikadu,Lensa Tesfaye; Prevalence of anemia and risk factors among pregnant mothers; Nekemt Referral hospital, south west ethiopia,2014 .Http://www.iiste.org/book/.
10. Massawe SN, Urassa En, NystromL, Lind markG; 1999: Effectiveness of primary level care in decreasing anemia at term in Tanzania. Acta Obstet Gynecol scand; 78:573-579.
11. EO Uche-NWachi , Odekumle, Jacinto singh. Anemia in pregnancy: Association with parity Abortions ,and chilled spacing in Uganda.Afr Health   sci.; 2010,10:66-70
12. Cyrilc, E. Onah .Prevalence of anemia among pregnant women. Med Gen med, 2007.9:251-8.

Table 1: background characteristics of attendants at ANC follow up clinic of JUSH, 2018

Variables	Categories	Frequency	
		Number	**Percentage**
Age	<18	7	3.4
	18-25	105	50.7
	26-35	88	42.5
	>35	7	3.4
Trimester	1st	46	22.2
	2nd	75	36.2
	3rd	88	41.5
Parity	0	62	30
	1-2	91	44
	3-5	46	22.2
	>5	8	3.9
Residence	Urban	124	59.9
	Rural	83	40.1
Literacy	Illiterate	77	37.2
	Primary	46	22.2
	Secondary school & above	84	40.6
Ethnicity	Oromo	146	70.5
	Amhara	40	19.3
	Tigre	16	7.7
	Other	5	2.4
Religion	Muslim	112	54.2
	Orthodox	63	30.4
	Protestant	32	15.5
	Other	0	0
Income monthly	<1000 birr	159	76.8
	1000-200birr	44	21.3
	>2000 birr	4	1.9
Birth interval	<2 yr	164	78.3
	>=2 yr	43	21.7
Abortion	Yes	65	31.4
	No	142	68.6
Contraceptive use	Yes	105	50.7
	No	102	49.3
Chronic illness	Yes	50	24.2
	No	157	75.8
Anemia	Yes	65	31.4
	No	142	68.6

Table 2: Risk factors associated with anemia among pregnant women attending ANC clinic at JUSH, 2018

Variables	Categories	Anemia				P- Value
		yes		No		
		No.	%	No.	%	
Age	<18 yr	1	14.2	6	85.9	0.031
	18-25 yr	27	25.7	78	74.3	
	26-35 yr	32	36.3	56	63.7	
	>35 yr	5	71.4	2	29.6	
Trimester	1st	11	24	35	76	0.245
	2nd	23	30.6	52	69.4	
	3rd	31	36	55	64	
Parity	0	13	21	49	79	0.032
	1-2	28	31	63	69	
	3-5	19	41.3	27	59.7	
	>5	5	62.5	2	37.5	
Residency	Urban	35	28	89	72	0.229
	Rural	30	36	53	64	
Literacy status	Illiterate	27	35	50	65	0.061
	Primary school	19	41.3	27	59.7	
	Secondary&above	19	22.6	65	77.4	
Ethnicity	Oromo	41	28.1	105	71.9	0.075
	Amhara	16	40	24	60	
	Tigri	8	50	8	50	
	Other	0	0	5	100	
Religion	Muslim	34	30.4	78	69.6	0.749
	Orthodox	22	35	41	65	
	Protestant	9	28.1	23	71.9	
Income	<1000 birr	51	32.1	108	67.9	0.395
	1000-2000 birr	14	31.8	30	68.2	
	>2000 birr	0	0	4	100	
Birth interval	<2yr	51	31.5	111	68.5	0.96
	>2yr	14	31.1	31	68.9	
Abortion	Yes	26	40	39	60	0.071
	No	39	27.5	103	72.5	
Contraceptive use	Yes	27	25.7	78	74.3	0.071
	No	38	37.2	64	62.8	
Chronic illness	Yes	24	48	26	52	0.004
	No	41	26.1	116	73.9	
Intestinal parasite	Yes	13	39.4	20	60.6	0.281
	No	52	29.9	122	70.1	
Malaria	Yes	25	36.8	43	60.2	0.245
	No	40	28.8	99	70.2	
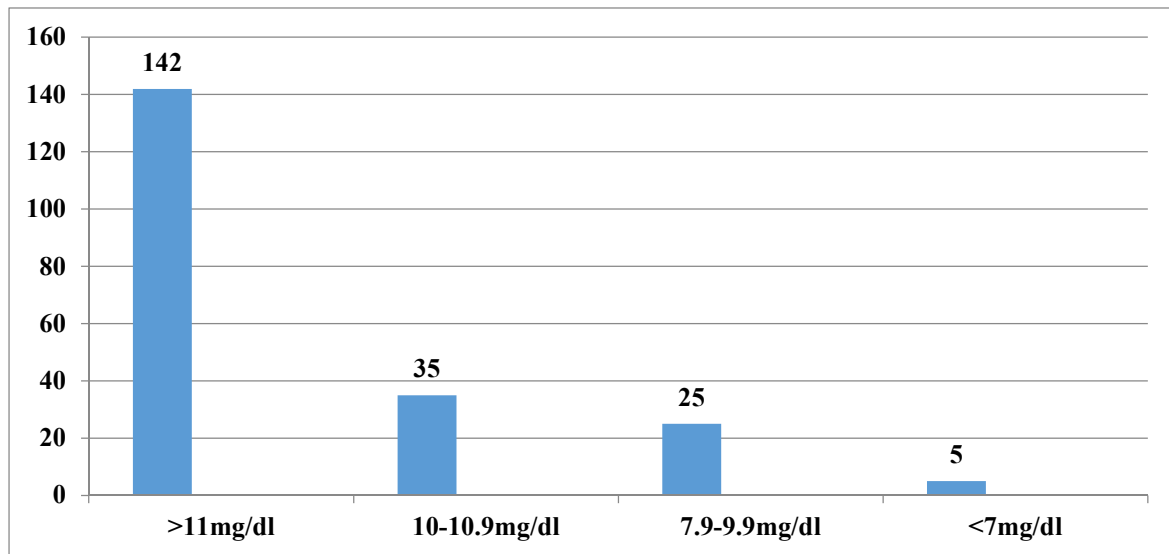
Graph 1: Severity of anemia among antenatal care attendants in Jimma University Specialized Hospital, 2018 G.C