Reproductive System & Sexual Disorders: Current Research

Pregnancy Anaemia Prevalence and Associated Factors among Women Attending Ante Natal Care in North Shoa Zone, Ethiopia

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Abstract

Background: Anaemia is a global public health problem affecting both developing and developed countries with major consequences on human health as well as social and economic development. Anaemia in pregnancy is a condition with effects that may be deleterious to mothers and fetuses. Indeed, it is a known risk factor for many maternal and fetal complications.

Objective: The study was aimed at assessing the prevalence of anaemia and associated factors among pregnant mothers attending Ante Natal Care Service in North Shoa Zone, Ethiopia.

Methods: Institution based cross sectional study design was conducted in Debre Berhan Health Institutions from September to December 2013. Antenatal care service providers in the respective health facilities collected the data by interview and laboratory tests using structured and semi structured questionnaire. Descriptive and analytical statistics were computed using SPSS version 16. Odds Ratios, P-values and 95% CIs - the analytical statistics from bivariate and multi variate logstic regression were used to identify predictor variables associated with the dependent variable - anaemia.

Result: A total of 295 participants completed the study making the response rate of 89.4%. The mean age of the participants was (25.6 + 5.4) the minimum and maximum age being 16 and 40 years old respectively. The prevalence of anaemia was found to be 9.7% out of which 64.3%, 32.1% and 3.6% respondents were with mild, moderate and sever anaemia respectively. Knowledge of mothers about anaemia in general and nausea and vomiting on the other hand were identified significantly associated with anaemia.

Conclusion: Anaemia prevalence was found to be 9.7% and knowledge of mothers about anaemia and nausea and vomiting were significantly associated with anemia. Therefore, long term and short term strategies helpful in alleviating these predisposing factors need to be developed so as to reduce the number of mothers affected by anaemia.

Introduction

Anaemia is the late manifestation of deficiency of nutrient(s) needed for hemoglobin synthesis. Most of the anaemia are due to inadequate supply of nutrients like iron, folic acid and vitamin B12, proteins, amino acids, vitamins A, C, and other vitamins of B-complex group i.e., niacin and pantothenic acid [1].

Anaemia is a global public health problem affecting both developing and developed countries with major consequences for human health as well as social and economic development. It occurs at all stages of the life cycle, but is more prevalent in pregnant women and young children [2].

Anaemia in pregnancy is a condition with effects that may be deleterious to mothers and fetuses and it is a known risk factor for many maternal and fetal complications [3,4]. About 4-16% of maternal death is due to anaemia. It also increases fetal and neonatal mortality and morbidity significantly [5]. Anaemia also results in an increased risk of premature delivery and low birth weights. Iron deficiency in late pregnancy results, in addition, in poor fetal iron stores known to alter brain iron content and neurotransmitters irreversibly in fetal life and postnatal babies [6].

World Health Organization has accepted up to 11 gm percent as the normal hemoglobin level in pregnancy. Therefore any hemoglobin level below 11gm in pregnancy should be considered as anaemia. In 2002, Iron Deficiency Anaemia (IDA) was considered to be among the most important contributing factors to the global burden of disease [2].

Studies showed a reduction in the haemoglobin level with increasing age of the pregnant women, number of pregnancies and the gestation age, frequency of health check-ups, socioeconomic status, parity and Body Mass Index (BMI) [7-9]. The prevalence of anaemia was significantly higher in those who registered for antenatal care in the third trimester than in those who registered in the second trimester, and in HIV-positive pregnant women than in HIV-negative ones. Anaemic cases were 4 times likely to have history of excess

menstrual bleeding prior to the index pregnancy, 2 times likely to have hook worm infection [10-12].

Studies in Africa reported a high prevalence of anaemia in pregnancy. Though research on antenatal anaemia is vital, studies in Ethiopia on the prevalence of anaemia among pregnant women are limited even no study had been conducted in the study area tough it is the most frequent morbidity among pregnant women. Therefore, this study was aimed at assessing the Prevalence and associated factors of pregnancy anaemia.

Methods

Institution based cross–sectional study design was conducted in North Shoa Zone, Ethiopia from September to December 2013. The study was conducted at health institutions serving more than 2 million populations. Pregnant women using ANC service at health institutions were taken as the source population while the study population was women attending antenatal care service from September to December 2013. And only first ANC attendants for the current pregnancy were included in to the study. But, pregnant women who were severely sick, unable to hear and taking treatment for anaemia in the last months were excluded. A total of 330 ANC attendant sample size were obtained by using single population proportion formula taking prevalence 38.2% from previous study. The data was collected by the ANC service providers in the respective health facilities using structured and semi structured questionnaire after they had been given one day training. The data collection methods used in this study was laboratory tests and interview. Laboratory tests were carried out to determine the hemoglobin level in the blood so as to classify mothers with respect to the dependent variable anaemia status. It was also used to get data regarding some independent variables such as HIV, Hookworm, and malaria infection status. On the other hand, interview method of the data collection was used to get data on the other predictor variables assumed to affect the dependent variable such as socio economic variables, reproductive history, nutritional condition etc. With an intention of getting quality data, activities including training of data collectors and supervisors, pretest of questionnaire and checkup of data completeness and consistency on daily base were

carried out. The completed questionnaire was checked for completeness and was coded by the principal investigator and co-investigators. Data was entered using Epi-info version 2002 software and then analysis was carried out using SPSS version 16. Descriptive statistics – means, standard deviations, tables and figures and, analytic statistics-ORs, CIs and P-values were computed to identify predictor variables. Ethical clearance was obtained from ethical committee of institute of medicine and health sciences, Debre Berhan University. The formal letter of cooperation was written to those concerned bodies in the study area. The study participants have been told about the purpose of the study, the possible discomfort it may cause and also the potential benefits it may result to help them make informed decision as to the participation in the study. In addition, they have been informed that the participation is completely voluntary that they have the right to interrupt the interview or not to participate in the study at all. Then oral consent for participation in the study was obtained.

Results

A total of 295 study participants completed the study making response rate of 89.4 %. The mean age of the participants were (25.6 + 5.4) being the minimum and maximum ages 16 and 40 years old respectively. Almost all the study participants are Amhara and Orthodox by ethnicity and religion respectively. Married 262 (91%) was the modal marital status. Mothers with primary education 100 (34.6%) by educational status and housewife 167 (57.6%) by occupation accounted the largest proportion in their respective categories.

Regarding parity and gravidity history of mothers, the majority 155 (54.2%) of the respondents reported one or more previous history of pregnancy. Age 20 to 24 was the age at which the majority 110 (44%) of the respondents encountered their first pregnancy. Most mothers 88 (58.3%) reported that they spaced the gap between the current and the predecessor pregnancy at least by three years. Among the participants interviewed, 27 (9.4%) and 146 (51.65) of them reported recent history of bleeding and nausea and, vomiting in the current pregnancy (Table 1).

Characteristics	Anaemia Status		
	Yes No. (%)	No No. (%)	Total No. (%)
Previous pregnancy			
Yes	11(39.3)	144(55.8)	155(54.2)
No	17(60.7)	114(44.2)	131(45.8)
No. of previous pregnancy			
1-3	9(81.8)	127(87)	136(86.6)
4-5	2(18.2)	15(10.3)	17(10.8)
6 and above	0	4(2.7)	4(2.5)
Age at first pregnancy			
15-19	5(23.8)	85(37.1)	90(36)
20-24	11(52.4)	99(43.2)	110(44)

25-29	5(23.8)	31(13.5)	36(14.4)
30-34	0	9(3.9)	9(3.6)
35-39	0	5(2.2)	5(2)
Age of current pregnancy			
<3 months	79(25)	69(26.5)	76(26.4)
3-6 months	6(21.4)	80(30.8)	8629.9)
>6 months	15(53.6)	111(42.7)	126(43.8)
Space between recent pregnancies			
Bellow one year	0	13 (9.1)	13(8.6)
One to two years	2(25)	48(33.6)	50(33.1)
Above three years	6(75)	82(57.3)	88(58.3)
Nausea & vomiting in the current pregnancy			
Yes	19(70.4)	127(49.6)	146(51.6)
No	8(29.6)	129(50.4)	137(48.4)
Bleeding in the current pregnancy			
Yes	3(10.7)	24(9.3)	27(9.4)
No	25(89.3)	234(90.7)	259(90.6)

Table 1: Parity and gravidity history of respondents attending ANC service in Debre Berhan Health Institutions from September to December 2013

Ante natal care attendants were also asked as to the previous utilization of ANC and health facility delivery. Out of the total 155 (54.2%) of mothers who have previous history of pregnancy, 111 (72.5%) of mothers reported history of one or more previous visit for ANC for one or more of the previous pregnancies. Among the mothers reported previous delivery history, the majority 82 (57.7%) have ever delivered at health facility. With respect to place of delivery of recent child, most 78 (58.2%) gave birth at health facilities while others did at home. Of those the remaining 59 (41.5%) participants, only 15 (11.8) of mothers were assisted by health workers (Table 2).

Characteristics	Anaemia Status		
	Yes No. (%)	No No. (%)	Total No. (%)
Ever delivered at health facility			
Yes	5(55.6)	77(57.9)	82(57.7)
No	4(44.4)	56(42.1)	60(42.3)
ANC for previous pregnancy			
Yes	7(58.3)	104(73.8)	111(72.5)
No	5(41.7)	37(26.2)	42(27.5)
Place of delivery of recent child			
Home	3(37.5)	56(41.8)	59(41.5)
Health institution	5(62.5)	78(58.2)	83(58.5)
Assisted the delivery			
TBA	8(88.9)	104(88.1)	112(88.2)

Health worker	1(11.1)	14(11.9)	15(11.8)

Table 2: ANC utilization and health facility delivery history of respondents attending ANC service in Debre Berhan Health Institutions from September to December 2013

Concerning history of use of family planning, out of the total respondents, the majority 183 (63.1%) of the respondents have ever used family planning. Use of injectible was reported by the majority 147 (70.7%) of the respondents followed by pills 24 (11.5%) (Figure 1).
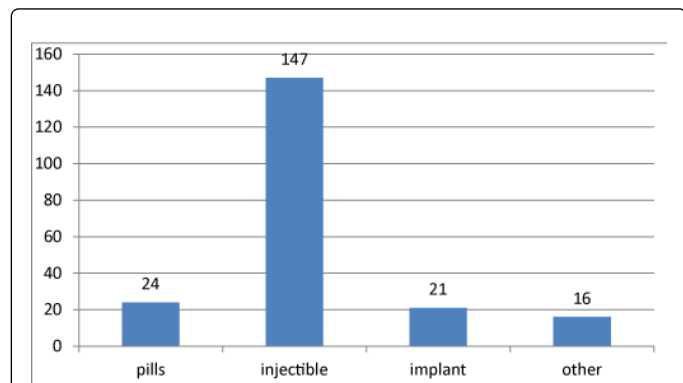

Figure 1: Family planning methods utilization of respondents attending ANC service in Debre Berhan Health Institutions from September to December 2013

Regarding feeding habit of respondents, most 166 (59.5%) of the respondents reported that they modify their food when they become pregnant. The modification of food reported by majority 123 (69.1%) of the respondents was by changing the type of food while the least 12 (6.7%) reported modify their food by decreasing the quantity of food. The type of food items preferred by the majority 57 (44.2%) of the respondent's was vegetables. Mothers have been also asked as to the frequency of feeding on animal and green vegetable foods. About fifty one percent of the respondents reported that they feed on animal product foods such as egg, milk and meat once per two weeks. As to the feeding of green vegetables on the other hand, 165 (57.7%) of the respondents fed at least every week.

Weight for height square ratio (BMI) to determine the nutritional status of mothers was also assessed. For the majority 204 (71.1%) of the mothers, BMI was in between 20 and 25 while BMI the least 4 (1.4%) being in between 31 and 40 (Figure 2).
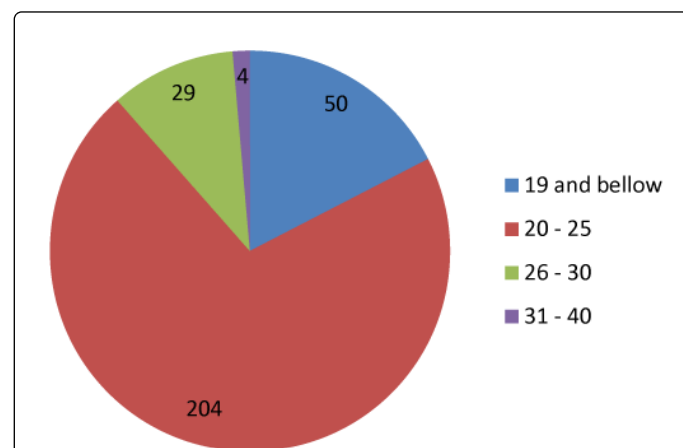

Figure 2: BMI condition of respondents attending ANC service in Debre Berhan Health Institutions from September to December 2013

About thirty five percent of the respondents have knowledge about anaemia. Nearly ninety two and seventy nine percent of the respondents think that anaemia is preventable and think spacing decrease the chance of acquiring anaemia respectively (Table 3).

Characteristic	Anaemia Status		
	Yes **No. (%)**	**No** **No. (%)**	**Total** **No. (%)**
Think spacing decrease anaemia			
Yes	21(75)	206(79.2)	227(78.8)
No	7(25)	54(20.8)	61(21.2)
Causes of anaemia			
Bleeding	5(29.4)	42(33.9)	47(33.3)
Starvation	11(64.7)	47(37.9)	58(41.1)
Others	1(5.9)	35(28.2)	36(25.5)
Anaemia is preventable			
Yes	27(96.4)	210(91.3)	237(91.9)
No	1(3.6)	20(8.7)	21(8.1)

Anaemia be treated			
Yes	21(75)	174(71.3)	195(71.7)
No	7(25)	70(28.7)	77(28.3)
Take medicine for anaemia			
Yes	28(100)	243(99.6)	271(99.6)
No	0	1(0.4)	1(0.4)

Table 3: Knowledge and attitude condition of respondents attending ANC service in Debre Berhan Health Institution from September to December 2013

As to the sources of information, the majority 132 (56.7%) of the respondents have got information from health workers, least 8 (3.4%) reported source of information as mass media (Figure 3).
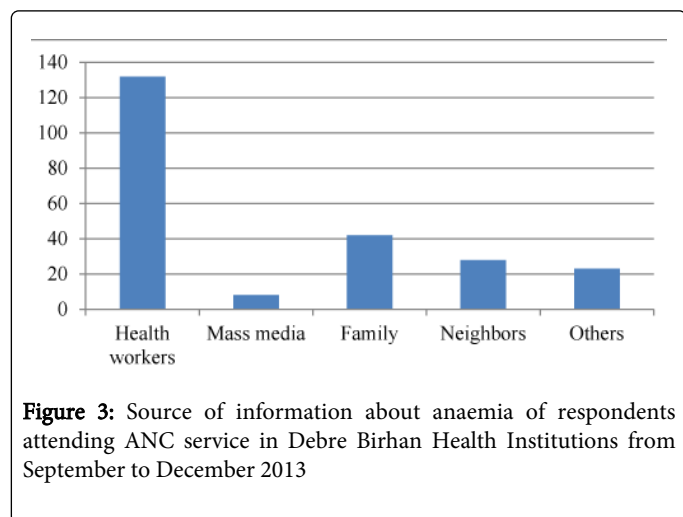

Figure 3: Source of information about anaemia of respondents attending ANC service in Debre Birhan Health Institutions from September to December 2013

Figure 4: Anaemia status of respondents attending ANC service in Debre Berhan Health Institutions from September to December 2013

Regarding anaemia status of mothers, 9.7% pregnant mothers were found to be anaemic out of which 64.3%, 32.1% and 3.6% were with mild, moderate and severe anaemia respectively (Figure 4).
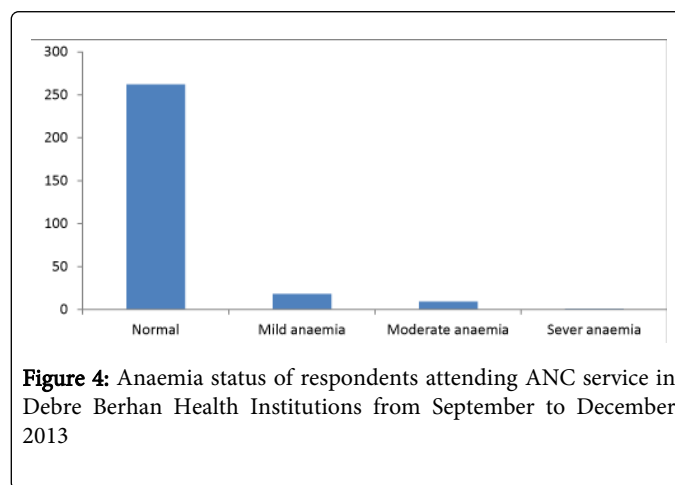
Respondents were also assessed for weather they have encountered infections. Malaria, HIV and hookworm infections were considered in the assessment. Out of the total participants, only 27 (9.4%) reported that they had history of malaria infection though no current infection was identified. But no any hook worm infection was identified even not previous infection history was reported by the respondents (Table 4).

Characteristics	Anaemia Status		
	Yes **No. (%)**	**No** **No. (%)**	**Total** **No. (%)**
Hook worm infection			
Yes	0	3(1.2)	3(1.1)
No	27(100)	238(98.8)	265(98.9)
Had malaria			
Yes	2(7.1)	25(9.7)	27(9.4)
No	26(92.9)	234(90.3)	260(90.6)
HIV status			
Yes	0	6(2.4)	6(2.2)
No	25(100)	243(97.6)	268(97.8)

Table 4: Infection status of respondents attending ANC service in Debre Birhan Health Institutions from September to December 2013

Association of variables

All variables believed to affect the dependent variable were under gone bivariate analysis to assess whether they do have independent association with the outcome variable. The variables family income, previous pregnancy, residence, consumption of green vegetable and animal food, tea drinking, nausea and vomiting during the current pregnancy, educational status, religion, age of mother and knowledge about anemia that showed p value of 0.3 and less were taken to multivariate analysis. Out those variables treated under multivariate analysis, only nausea and vomiting during the current pregnancy and residence were significant and marginally significant respectively at 5% level of significance. Mothers who encountered nausea and vomiting during the current pregnancy were 3 times more likely to develop anaemia compared to their counter parts (AOR = 3.00, 95%CI = 1.02, 8.89) (Table 5).

Characteristics	Anaemia Status			
	Yes	No	COR (95%CI)	AOR (95%CI)
Residence				
Urban	15	103	1.00	
Rural	7	104	1.81(0.81, 4.04)	0.35(0.12, 1.04)
Monthly income				
500 and bellow	15	103	0.46(0.18, 1.18)	0.35(0.10, 1.17)
500-999	69	50	0.56(0.18, 1.76)	0.22(0.05, 0.94)
1000 and above	7	104	1.00	
Knowledge of anaemia				
Yes	12	85	1.00	
No	16	161	1.42(0.64, 3.14)	2.32(0.86, 6.30)
Nausea and vomiting				
Yes	19	127	2.41(1.02, 5.71)	3(1.02, 8.89)
No	8	129	1.00	
Green vegetables				
Daily	6	18	1.00	
Every two days	3	35	3.89(0.87, 17.39)	6(0.92, 39.67)
Once per week	12	153	4.25(1.42, 12.70)	8(1.87, 35.62)
Every two weeks	5	46	3.07(0.83, 11.32)	4.88(0.86, 27.53)
Not at all	1	7	2.33(0.24, 23.04)	1.18(0.07, 20.36)

Table 5: Association of variables with anemia among respondents attending ANC service in Debre Berhan Health Institutions from September to December 2013

Discussion

In this study, 9.4% of mothers were found to be anaemic out of which 64.3%, 32.1% and 3.6% were with mild, moderate and severe anaemia respectively. This finding is inconsistent with the study conducted in In-parta prvince Turkey, rural India community, Enugu Nigeria, Northern Tanzania and Jimma - Ethiopia reporting a prevalence rate of 42.71%, 74.8%, 40.4%, 47.4% and 38.2% respectively. This inconsistency between this study finding and the studies conducted on outside of Ethiopia might be due to the differences with respect to socio cultural, socio economic, and geographical conditions. Specifically, the high prevalence of anaemia in Is- parta, turkey might be due to the prevalence of thalassemia in the country whereas the difference between this study finding and the finding of the studies conducted in Indian community might be due to the population being purely rural population. On the other hand, the study conducted in Jimma referal hospital might be due to exclusion of mothers who ever used ANC service prior to the study. Regarding the levels of anaemic status, in this study, 64.3% of the respondents were mildly anaemic while 32.1% and 3.6% were moderately and severely anaemic. This finding also is match more deviated from the findings obtained in the study conducted in rural Indian community revealed 50.9% moderate anaemia while mild and severe anaemia were recorded to be 70 (30.17%) and 44 (18.9%) respectively. On the other hand, the study conducted in Enungu Nigeria demonstrated that 90.7% of these anaemic patients were mildly anaemic, whereas 9.3% were moderately anaemic while there was no case of severe anaemia reported. This finding is also much more deviated from the current study. Even a study conducted in one of the East African countries Tanzania showed

a great difference about the proportions of mothers with different levels of anaemia showing proportion as 35.3% had mild anaemia, 9.9% had moderate anaemia, and 2.1% had severe anaemia.

Regarding the factors contributing for acquisition of amaemia among pregnant mothers, different studies reported as different variables were affecting the probability of mothers being anaemic. In this study, several variables were assessed to determine whether they did affect the outcome variable anaemic status, but very few variables were found to affect the dependent variable in the bivariate analysis out of which only a single variable-nauasea and vomiting during the current pregnancy showed significant association in the multivariate analysis. In this study mothers who encountered nausea and vomiting in the current pregnancy were 3 times more likely to be anaemic compared to those mothers who did not faced such problem during the current pregnancy (AOR=3, 95%CI=1.02, 8.89). In a study conducted in Is-parta province, haemoglobin level was found to be reduced with in-creasing age of the pregnant women, number of pregnancies and the gestation age while positive correlation between the haemoglobin level and the frequency of health check-ups was reported. In a study conducted in rural Indian community, a highly significant association was found with the mother's age, educational and socioeconomic status, religion, parity and Body Mass Index (BMI). Other factors such as family structure and size, dietary habits and attainment of menarche were not significantly associated with anaemia. Studies of Enugu also reported the prevalence of anaemia was significantly higher in those who registered for antenatal care in the third trimester than in those who registered in the second trimester, and in HIV-positive pregnant women than in HIV-negative ones (P=0.00). The other study conducted in northern Tanzania found that anaemia was significantly prevalent in mothers with HIV (OR=1.5), malaria (OR=5.2), clinic of recruitment (OR=1.5) and low income (OR=1.9). In a study conducted in Jimma anemic cases were 4 times likely to have history of excess menstrual bleeding prior to the index pregnancy 2 times likely to have hook worm infection and 3 times likely not to have shoe wearing habit, 3 times likely to have birth intervals less than 24 months between the previous pregnancy and index pregnancy (p<0.05).

Conclusion

In conclusion, the prevalence of anaemia in this study population was found to be low compared to the findings of others'. Mothers who encountered nausea and vomiting during the current pregnancy were more likely to develop anaemia. Why a mother become anaemic was not known by the majority of mothers. There are significant numbers of mothers who decrease the amount of their food when they become pregnant. There were also pregnant women who feed on food items that may even aggravate the occurrence of anaemia.

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