



TO STUDY THE PREVALENCE OF ANAEMIA AMONG PREGNANT WOMEN IN NORTH INDIA: A CROSS SECTIONAL STUDY

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ABSTRACT **Background:** Anaemia is a severe public health problem affecting both developed and developing countries with major consequences for human health as well as socio economic development. WHO has estimated that prevalence of anaemia in pregnant women is 14% in developed and 51% in developing countries. In India prevalence of anaemia is 65-75%. The aim of the present study was to understand the health profile and the socio demographic factors and to estimate the exact prevalence of anaemia among pregnant women based on the level of hemoglobin.

Method: 500 pregnant women attending antenatal clinic for the first time in department of Obstetrics and Gynecology at Adesh hospital bathinda were included in study applying inclusion and exclusion criteria and after proper written consent. The haemoglobin of all 500 subjects was measured using Automated cell counter method. Those with haemoglobin level <11gm/dl was considered as anaemic and were investigated further.

Results: The overall prevalence of anaemia among study participants was 81.8%. Out of these 0.2% of them were identified as severely anaemic, 91% of them were moderately anaemic and 8.8% were mildly anaemic according to ICMR classification of anaemia.

Conclusion: Present study concludes that prevalence of anaemia among the women attending antenatal clinic is 81.8% which is a serious public health problem. Early detection and effective management of anaemia in pregnancy can contribute substantially to reduction in maternal mortality.

KEYWORDS : Anaemia, Socio demographic factors, Prevalence, Pregnant women.

INTRODUCTION

Anaemia is a severe public health problem affecting both developed and developing countries with major consequences for human health as well as socio economic development. It occurs at all stages of life but is more prevalent in pregnant women and young children. It is estimated worldwide that 41.8% of pregnant and 30.2% of non-pregnant women are anaemic.^[1] WHO has estimated that prevalence of anaemia in pregnant women is 14% in developed and 51% in developing countries. In India prevalence of anaemia is 65-75% and at the same time, it is painful to mention that India contributes to about 80% of the maternal deaths due to anaemia in South Asia.^[2]

Anaemia is a condition in which the number of red blood cells or their oxygen carrying capacity is insufficient to meet the physiological needs, which varies by age, sex, altitude and pregnancy status.^[3] There are various contributing factors for anaemia during pregnancy like nutritional, genetic, and infectious disease.^[4] These factors vary by geography, level of development and other socio economic factors. Anaemia is considered as a major cause of maternal and fetal morbidity and mortality in developing countries.^[5] It may lead to premature birth, low birth weight, fetal cognitive impairment and fetal death.^[6] Antepartum complication associated or aggravated by anaemia are pre-eclampsia and antepartum hemorrhage. It may aggravate puerperal sepsis and thromboembolic complications and lead to sub-involution of the uterus, failure of lactation and delayed wound healing. The ability to cope with infection in the puerperium is significantly undermined by anaemia.^[7] This study is an important step forward to establish evidence based information on the prevalence of anaemia and its associated risk factors in pregnant women in the study area.

MATERIAL AND METHODS

Setting: Study was carried out in the Department of Obstetrics and Gynecology and the Department of Pathology, AIMSRS, Bathinda for a period of 1 year after getting permission from institutional ethical committee.

Type of study: Cross Sectional Study

Population Participants

All pregnant women attending antenatal clinics in department of Obstetrics and Gynecology at Adesh Hospital, Bathinda, were included in the study as per inclusion and exclusion criteria after informed consent.

Inclusion criteria

All pregnant women attending ANC clinic in department of Obstetrics and Gynaecology in Adesh Hospital, Bathinda at first visit.

Exclusion Criteria

Follow up antenatal women.

Method of Data collection

The data collection tool used for study was an interview schedule that was conducted at the institute with assistance from faculty members and other experts. The questionnaire contains detailed social demographic profile of the women that is (age, religion, family size, family income, residence, education level of women).

Collection and analysis of blood samples

The vein puncture site was cleaned using a swab containing 70% alcohol and using aseptic methods, an appropriate vein was identified and a hypodermic needle introduced into the vein. About 3-4ml of venous blood was drawn into a syringe and then transferred into a sterile vacutainer containing EDTA and transported to the laboratory for analysis. Laboratory analysis was done using a automated cell counter method that was used to determine CBC from a venous blood sample. The closed mode of blood sampling was used; the analyser automatically sampled blood, processed, analysed and printed out the haemoglobin concentration levels.

Assessment of anemia:-

Haemoglobin cutoff value adjusted to sea level altitude was used to define anemia on the basis of ICMR Classification^[8]:-

Anaemia

Haemoglobin level <11g/dl for pregnant women

Grades of anaemia	Haemoglobin level
Mild	10-10.9gm/dl
Moderate	7-9.9gm/dl
Severe	4-6.9gm/dl
Very severe	<4gm/dl

Statistical Analysis

A Chi-square test was applied using binary logistic IBM SPSS 22 version for qualitative analysis of various factors for anaemia with p-value <0.05. Graphical representation was done in MS Excel 2010.

RESULTS

Total of 500 subjects attending the anc clinic for the first time at AIMSR, Bathinda were studied to know the prevalence of factors associated with anaemia. It was a cross-sectional study done by applying Chi-square for p-value. Results and observation of these subjects is as follows:

1.Prevalence of anaemia

Out of 500 subjects recruited in the study, anaemia was present in 409 subjects while 91 subjects were not anaemic. Hence 81.8% of the cases were anaemic.

Table 1. Distribution of prevalence of anaemia among participants

Prevalence of anaemia	Number(n)	Percentage(%)
Anaemia	409	81.8
Non anaemia	91	18.2
Total	500	100

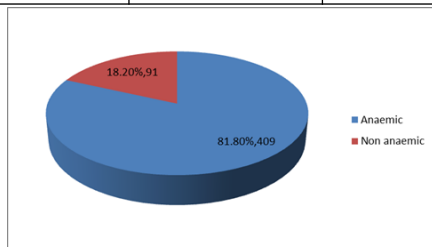


Figure 1: Percentage distribution of prevalence of anaemia among participants

2. Magnitude of anaemia

The overall burden of anaemia among study participants was 409 (81.8%). Out of these 1(0.2%) of them were identified as severely anaemic, 372(91%) of them were moderately anaemic and 36(8.8%) were mildly anaemic with haemoglobin level of 10-10.9g/dl. Hence, maximum no. of subjects were found to be moderately anaemic.

Table 2. Distribution of magnitude of anaemia

Mild (10-10.9)	36 (8.8%)
Moderate (7-9.9)	372 (91%)
Severe (4-6.9)	1 (0.2%)
Very Severe (<4)	0

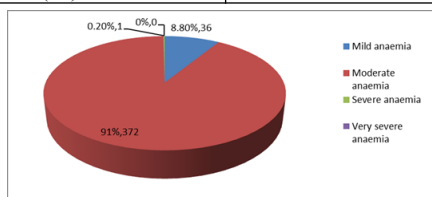


Figure 2: Percentage distribution of magnitude of anaemia

3. Socio-demographic factors associated with anaemia in pregnancy were studied:-

(I). Residence

The subjects were divided into 2 groups on the basis of residence. Out of 409 who were anaemic 278 (68%) patients belonged to rural settings while 131(32%) came from the urban area. Hence, the results showed rural population to be significantly anaemic in comparison to urban population.

Table3 (I). Distribution according to residence

Residence	Anaemia (n = 409)	Non anaemia(n=91)	Total (n= 500)
Urban	131(32%)	42(46.1%)	173(34.6%)
Rural	278(68%)	49(53.9%)	327(65.4%)

This association of residence with anaemia was found to be significant with ($\chi^2 = 6.56$, p-value 0.001).

3 (ii). Income

Income (Rs)	Anaemic (n=409)	Non anaemic (n=91)	Total (n=500)
<10,000	350(85.6%)	71(78%)	421(84.2%)
10,000-20,000	34(8.3%)	12(13.2%)	46(9.2%)
>20,000	25(6.1%)	8(8.8%)	33(6.6%)

This association of income was found to be significant with ($\chi^2 = 6.59$, p-value 0.016).

3 (iii). Occupation

On the basis of occupation, about 33.5% patients were housewife, 11% subjects were laborers working in the field while maximum no. of subjects i.e. 55.5% subjects were employed in some form of business establishment in the anaemic group. 99% were employed in the non anaemic group.

Table 3 (iii). Distribution according to occupation

Occupation	Anaemic (n=409)	Non anaemic (n=91)	Total (n=500)
Housewife	137(33.5%)	1(1%)	138(27.6%)
Laborer	45(11%)	0	45(9%)
Employee	227(55.5%)	90(99%)	317(63.4%)

There was a significant association with ($\chi^2 = 60.43$, p value=0.0001) observed between occupation and occurrence of anaemia.

DISCUSSION

Anaemia is a worldwide problem affecting all groups. Pregnant women and children are the most vulnerable group. In our study, the overall prevalence of anaemia among pregnant women was 81.8%. The study aimed at estimating the prevalence of anaemia in pregnancy and identifying its associated factors among women receiving antenatal care.

1.Prevalence of anaemia during pregnancy

Worldwide, the prevalence of anaemia during pregnancy has been estimated at 41.8% Mc Lean *et al.* (2006).^[9] In developing countries, the prevalence of anaemia during pregnancy is 60% Agan *et al.* (2010).^[10] In Africa, 57.1% of pregnant women are anaemic Benoist *et al.* (2008).^[11] In Kenya the national prevalence of anaemia in pregnancy was 55.1%.^[11] In this study, the overall prevalence of anaemia among pregnant women was 81.8%. A study carried out among 7 states by Nutrition Foundation of India had observed the overall prevalence of anaemia as 84% among pregnant women.^[12] "Indian Council of Medical Research (ICMR) Task Force Multicenter Study" also revealed that the overall prevalence of anaemia among pregnant women from 16 districts was 84.9% (range 61.0% - 96.8%).^[5] Results of these studies are comparable to the present study. Similar results were obtained in a study by Gautam *et al.* 2002^[13] which showed 96.5% prevalence followed by Lokare *et al.* (2012)^[14] and Mangla *et al.* (2016)^[15] who showed 87.2% and 98% prevalence of anaemia respectively in their studies.

2. Magnitude of anaemia during pregnancy

In the present study, all patients were divided according to the magnitude of anaemia. It has been found that mild, moderate, and severe anaemia accounts for 8.8%, 91% and 0.2% cases respectively. However another study carried out in Andhra Pradesh stated 52.73% subjects demonstrated mild degree of anaemia, 40.97% subjects with moderate anaemia and 6.2% subjects had severe anaemia.^[16] The result is higher than a study conducted by WHO (1992)^[17], Desalegn *et al.* (1993)^[18] and Lokare *et al.* (2012)^[14] where moderate anaemia accounted for 68%, 74.3% and 54.5% respectively.

3. I Socio-demographic factors associated with anaemia in pregnancy:

3 (a) . Relationship between residence and anaemia

In the present study, 68% subjects with anaemia belonged to rural population followed by 32% belonging to the urban population. This may be attributed to the fact that maximum subjects do not take iron folic acid supplements and are more prone to malnutrition as well. The reason for higher burden of anemia in the rural population may be related to inaccessibility of health care centers. However, lack of awareness about the factors causing anaemia and possible strategies to prevent the risk factors of anaemia plays a major role.

The present study had results similar to the study conducted by Mihiretie *et al.* (2015)^[19], Weldemariam *et al.* (2018)^[20] with 62%, 65.9% subjects belonging to rural population and having anaemia. However a study done by Mekonnen *et al.* (2018)^[21], maximum subjects having anaemia i.e. 67% belonged to the urban population.

3 (b) . Relationship between income and anaemia

In the present study maximum no. of subjects with anaemia i.e. 85.6% belonged to low socio economic group i.e. income of <Rs 10,000 per capita. This may be due to the reason that the low socioeconomic class

was likely to be poorly educated and often have financial constraints. Such women are likely to find it difficult to access and afford good health services. It is also supported by the observation that women with low income tend to consume diets that are low in micronutrients, animal protein and vitamins.^[22] A similar study was conducted by Okube *et al.* in (2016)²³ and they too, found 58.8% patients with income <10,000 to be anaemic. Studies by Singh *et al.* (1998)²⁴, Javed *et al.* (2001)²⁵, Lokare *et al.* (2012)¹⁴ noted women of low socio economic group had higher prevalence of anaemia. Our study is thus, comparable with these studies.

3 (c) . Relationship between occupation and anaemia

The proportion of anaemia was significantly more among employed participants which was noted to be 55.5%. Time constraint may be the reason for anaemia in them. May be they don't get enough time for rest and to attend antenatal clinics. They tend to forget intake of iron quiet frequently. Furthermore, most of these women would be considered underemployed, i.e. employed but with jobs that were unsteady and low paying.

Housewives on the other hand could have high family income which makes them remain in the house. Also, it may be postulated that being housewife has an added advantage of having adequate resources like good housing, clean water and sanitation, enough time to attend antenatal clinic. The Present study was similar to study conducted by Obai *et al.* (2016)²⁶, Getahun *et al.* (2017)²⁷, Prashant *et al.* (2017)²⁸, Ayano *et al.* (2018)²⁹ where proportion of anaemia was significantly more among employed participants 68% 51.7% and 77.08%.

CONCLUSION

Present study concludes that prevalence of anaemia among the women attending antenatal clinic is 81.8% which is a serious public health problem. Early detection and effective management of anaemia in pregnancy can contribute substantially to reduction in maternal mortality. There is a significantly high prevalence of anaemia among pregnant women in rural areas of Punjab. Our study has also enlisted a few socio demographic factors that contribute to such high prevalence of anaemia. Program focused on target population need to be planned and implemented with active participation of locals.

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