



## Study of Types of Anemia in Antenatal Mothers Attending As Outpatients in Obstetrics and Gynecology Department of Tertiary Care Hospital

### KEYWORDS

Anemia, Antenatal mothers, Hemoglobin, Morphological types.

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**ABSTRACT** Anemia during pregnancy is an important public health problem in developing countries, associated with both maternal and fetal mortality and morbidity.

**Aim:** The purpose of this study is to evaluate the prevalence and morphological types of anemia among antenatal mothers for effective treatment and to create awareness for prevention.

**Methods:** 100 antenatal mothers of 19-40 years were selected for 2 months. Hemoglobin levels were estimated using auto analyzer and morphological typing of anemia was done by peripheral smear examination.

**Results:** Out of 100 Antenatal mothers, 83 had anemia. Among them, all cases (100%) in 28-33 years had anemia. 93% of multigravida and 71% of primigravida were anemic. Majority cases(63%) showed microcytic hypochromic anemia.

**Conclusion:** Prevalence of anemia increased with increasing age and multiparity. Microcytic hypochromic anemia was the commonest morphological type. By providing regular antenatal checkup, nutritional supplements and awareness, the incidence of anemia can be prevented.

### INTRODUCTION:

Anemia is defined as reduced oxygen carrying capacity of the blood due to reduced number of RBCs or reduced haemoglobin. As per the guidelines proposed by the expert group of WHO, anemia is considered to exist when Haemoglobin level is <11gm/dl in pregnant women [1]. Anemia occurring during pregnancy is an important public health problem in the developing countries. According to WHO estimation the prevalence of anemia in pregnant women in developing countries is 51% out of which 65-75% is in India [2]. India contributes to about 80% of the maternal deaths caused by anemia in South Asia [3].

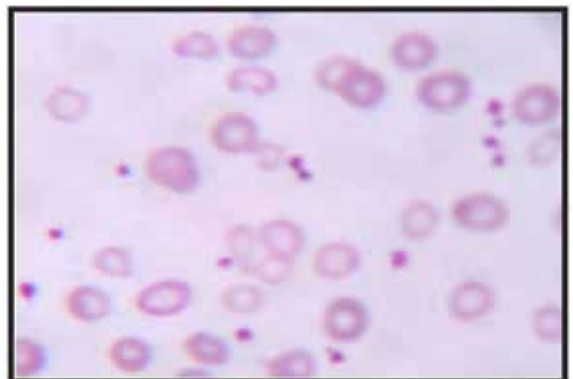
Severe anemia during pregnancy may retard the foetal growth or may result in premature delivery. If there is heavy bleeding at the time of delivery or in a Caesarean section, anemia becomes a very dangerous issue and may require blood transfusion which may further increase the risk of infection. Anemia in antenatal mothers is mainly caused by increased demand for iron and haemodilution due to disproportionate increase in plasma volume. Maternal anemia is often associated with increased risk of foetal mortality and morbidity. [3] Ninety percent of anemia in antenatal mothers is due to iron deficiency and may also be due to lack of vitamins. The aim of this study is to evaluate the number of anemia cases and detect the morphological types of anemia among the antenatal mothers. The significance of the study is that, it helps to effectively manage anemia in antenatal mothers.

### MATERIALS AND METHODS

**Study place:** Department of Obstetrics and Gynecology and Department of Pathology, Chengalpattu Medical College and Hospital, Chengalpattu.

**Study design:** The present descriptive study was conducted during the period of July 2014 and August 2015. Ethical clearance for the study was obtained from the Institutional Ethics Committee of Chengalpattu Medical College, Chengalpattu.

**Fig.-1 : Microcytic hypochromic anemia**



**Study population:** A total number of 100 antenatal mothers of age group 19-40 yrs who attended as outpatients in Obstetrics and Gynecology department during this period were selected. Written consent was obtained from all the participants. Blood sample was collected from study population at Pathology laboratory in a EDTA tubes ( Ethylene diamine tetraacetic acid) and prevalence of anemia was analysed.

**Materials used:** EDTA tubes, Autoanalyser, Leishman stain for peripheral smear study.

**Method:** The study is made by collecting the blood samples from the study individuals in EDTA tubes (Ethylene Diamine Tetraacetic acid) and haemoglobin levels were estimated using Sysmex A7164 autoanalyser to detect anemia. Automated blood cell counters involve voltage-pulse impedance analysis and low or high angle light scatter from a coherent or laser light source. It provides various red cell indices accurately and quickly such as Hemoglobin level, Mean Corpuscular Volume, Mean Corpuscular Haemoglobin, Mean Corpuscular Haemoglobin Concentration etc., which can later be correlated with the blood smear analysis for detection of morphological type of anemia.

The main criteria for grading anemia with the concentration of haemoglobin is as: severely anemic: < 7 gm%, moderately anemic: 7-8 gm%, mildly anemic: 8-10 gm%. The morphological typing of anemia is done by peripheral blood smear examination.

**Smear preparation:** The smear is made by placing a drop of blood on one end of the slide. Then using a spreader slide a firm and quick swiping movement is made at a slanting angle to disperse the blood over an area of 3cm of the slide's length. The smear is done in such a way that it produces a tongue shaped smear and the cells are spaced far enough apart to be counted and differentiated. Smears are then air dried. Air drying is followed by Leishman staining.

**Staining:** In Leishman staining, the amount of stain sufficient to cover the smear is added. After about 2 minutes, double the amount of buffer water is added and mixed with the stain present. A proper time is elapsed according to the stock used (mostly 10-15 minutes) and the slide is washed off and dried.

The smear thus obtained is observed under microscope for the morphological typing of RBCs. In peripheral smear, normal RBCs are observed as anucleate with central one third pallor and outer peripheral dense rim of haemoglobin. The haemoglobin imparts a pink to orange-red cytoplasm with typically no inclusions. All RBCs are relatively uniform in size and shape in normal subjects. Based on the morphological typing of RBCs, anemia is categorized as

Normocytic Normochromic anemia

Microcytic Hypochromic anemia

Macrocytic anemia

Others (sickle cell, spherocyte...etc )

**Data Collection:** The level of hemoglobin is assessed by autoanalyser and morphological type of anemia is studied by peripheral smear.

**Statistical analysis:** Data obtained were coded and entered into the Microsoft excel spread sheet. Data's were collected and expressed in frequency and proportions. All statistical analysis was performed using SPSS statistical software version 16. Charts were prepared using Microsoft excel 2007.

## RESULTS

In the Present Study, out of 100 antenatal mothers, 83 mothers presented with anemia. Anemia was more prevalent in the age group of 28-33 yrs, (100%) and 19-22yrs (86%) of age. ( Table-1).

In this study, out of 100 antenatal mothers selected, 45 mothers were primigravida, 55 mothers were multigravida. Prevalence of anemia was high in multigravida (93%) than primigravida (71%). (Table-2).

Microcytic hypochromic anemia was more common than other types of anemia. Out of 83 anemia cases, 52 cases (63%) showed microcytic hypochromic anemia.(Table-3, Fig-1). 19 cases (23%) showed dimorphic anemia (Fig-2) and 12 cases (14%) showed normocytic normochromic anemia.

The prevalence of anemia in this study was 83% and severity was graded which includes 78% of mildly anemic, 22% of moderately anemic. (Table-4)

## DISCUSSION:

In South Asia, India contributes about 80% of the maternal deaths caused by anemia [3]. In addition, maternal anemia is considered as a risk factor for poor pregnancy outcomes and it threatens the life of foetus also. A total of hundred pregnant women attending the outpatient of Obstetrics and Gynecology department of Chengalpet Medical College, constituted the study population. All the pregnant women in the study group were in the age of group of 19- 40 years.

It was found that out of 100 mothers studied, 83 (83%) showed Hb level of less than 11g%. Only 17 cases (17%) showed Hb levels of more than 11g%. This is in accordance with the study of Toteja GS et al (84.9%), Priyali Pathak et al (85.4%) and IJMSPH(2013) by Meenakshi Khapre which showed 86% prevalence of anemia. However in developed countries, the prevalence of anemia was only 18% among pregnant women, as reported by WHO (1998) [2].

Socio-economic developments, higher standard of living, better utilization of health care facilities, along with increasing literacy rate, are associated with the low prevalence of anemia in developed countries.

Maternal age is an important risk factor for adverse pregnancy outcome. Age wise distribution of anemia among the study population has been shown in [Table-1.] which showed that all the thirty cases (100%) who were around 30 years of age (in the category 28-32 & >33) were reported to have anemia. 86% of the anemia cases were seen in the age group of 19-22yrs. 69% of the anemic women were 28-33 years of age as seen in a study conducted by Viveki et al.,(4). Thus prevalence of maternal anemia is high with increasing age [5, 6]. Similarly, twenty four cases in age group of 20 years (19-22) were reported to have anemia (86%). Parity also constitutes one of the risk factor for anemia resulting in still birth. Among 55 multigravida mothers 51 cases (93%) were anemic; similarly among 45 primigravida mothers only 32 cases (71%) were anemic. [Table-2].

The small interval period between successive pregnancies in multigravida may be the cause of poor iron stores for next pregnancy, since there is no time to replenish the depleted iron. But in primigravida, it may be due to teenage pregnancies and poor nutrition, hyperemesis and menstrual loss, which are not replenished [7]. Maternal parity and age showed a significant positive association with anemia in mothers which is similar to the study of Awoudu O, Borke (2007) among Nigerian population.

In our study, peripheral blood smear showed microcytic hypochromic as the most common morphological type of anemia. The predominant findings of microcytic hypochromic anaemia were consistent with those of Virender et al.,

[8]. Among 83 anemic cases smears showed microcytic hypochromic anaemia in 52 cases (63%) [Table-3, Fig-1 ]. This was in accordance with the study done by Vijaynath et al. [7].

12 cases (14%) showed normocytic normochromic cells in the peripheral smear with normal morphology however with reduced Hemoglobin level. Remaining 19 cases (23%) showed dimorphic picture.[ Fig-2].

Dimorphic refers to anemia that has two different causes acting together e.g. iron deficiency as well as a Vitamin B12 or folate deficiency and all such cases in our study belonged to third trimester[9]. This may be due to increased folate need in the third trimester.

In our study the prevalence of mild anemia is 78% (65 cases) out of 83 anemic cases which is similar to the study of Srinivasa Rao et al.,2013. However it is higher than the study of Umesh Kapil et al (29.4%) and Priyali Pathak et al (30.4%).

But the prevalence of moderate anemia observed by Umesh Kapil et al (47.8%) and Priyali Pathak et al(53.2%) was higher than our study which shows the prevalence as 22% (18cases). None of the women in our study were severely anemic which is in accordance with Srinivasa Rao et al 2013 . [ Table-4].

Incidentally, this is also similar to other recent studies from southeastern Nigeria [10,11] and Ibadan, Western Nigeria,[12] However it is lower than the findings observed by Umesh Kapil et al (1.6%)and Priyali Pathak et al(1.5%). This may be due to better nutritional status of our study subjects compared to them.

Data from surveys carried out by National Family Health Survey (NFHS) [13], Indian Council of Medical Research [14] showed that there has not been any decline in cases of anemia in pregnancy which is also in concordance with other studies done by National Nutritional Monitoring Bureau [15] and District Level Household Survey [16].

Poverty, ignorance, non-availability and/or failure in utilizing available medical facilities have been shown to be associated with maternal anemia on one hand and with maternal and perinatal morbidity and mortality on the other, though the association is not causal. The 10th five year plan emphasized the need of universal screening for anemia in pregnant mothers and early detection and management for the same [17].

Similarly by regular antenatal booking and frequent visits to antenatal clinic and giving nutritional supplements during the antenatal period, prevalence of anemia can be prevented. Health education given to improve the utilization of available facilities and improvement in the health care delivery system to cater to the needy, right at their door steps may thus go a long way in reducing adverse obstetric outcomes associated with maternal anemia.

#### CONCLUSION:-

Our present study done in the antenatal mothers showed that 83% of cases were reported to have anemia. In spite of regular antenatal visits and iron tablets, most of them showed microcytic hypochromic anaemia indicating iron deficiency. There was also an increased prevalence of anemia among multigravida. Thus this study helps to detect the prevalence of anemia among the antenatal mothers

and the morphological types of anemia.

The results can be used for effective management of anemia, by knowing their cause. Thus it helps to reduce the incidence of anemia among the antenatal mothers by providing education and imparting proper knowledge and awareness among them. This in turn will be of great help in reducing both foetal and maternal morbidity and mortality caused by anemia.

Regular patient education given by imparting proper knowledge regarding iron rich foods, food fortification, implementation of anemia prophylaxis program from adolescence, regular antenatal care from first trimester, play a vital role in managing maternal anemia effectively and for effective perinatal outcomes.

**Table 1: Age Wise Distribution Of Anemia:-**

Age	No of Ante-natal mothers	No of Anemic patients	Percentage
19-22	28	24	86%
23-27	42	29	69%
28-32	26	26	100%
28-32	4	4	100%
Total	100	83	83%

**Table 2: Prevalence Of Anemia Based On Gravida**

Gravida	No of Ante-natal mothers	No of Anemic patients	Percentage
Primigravida	45	32	71%
Multigravida	55	51	93%
Total	100	83	

**Table 3: Morphological Types Of Anemia**

Types Of Anemia	No of cases (n=83)	Percentage
Microcytic Hypochromic	52	63%
Normocytic Normochromic	12	14%
Dimorphic Anemia	19	23%

**Table 4:- Grade Wise Distribution Of Anemia**

Grades Of Anemia	No of cases	Percentage
Mild	65	78%
Moderate	18	22%
Severe	0	0

**Fig-1: Microcytic hypochromic anemia**

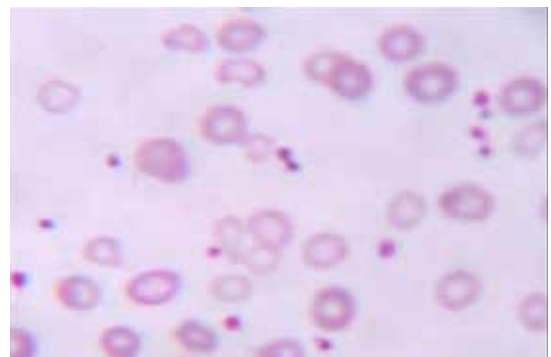
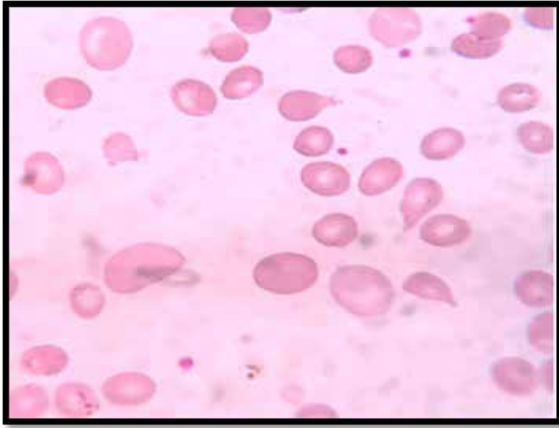


Fig -2: Dimorphic anemia.



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