

CLINICO PATHOLOGICAL STUDY OF PATTERNS OF ANEMIA DURING PREGNANCY

Chamakuri Nirmala¹, I. Vijaya Bharathi², D. S. Arpitha³, B. V. S. Kartheek⁴, P. Sreevalli⁵, A. Bhagyalakshmi⁶

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ABSTRACT: INTRODUCTION: Anemia is defined as haemoglobin level in the blood below the lower extreme of the normal range for the age and sex of the individual. According to WHO, in developing countries the prevalence of anemia among pregnant women averages 60%, ranging between 35 to 100% among different regions of the world. A hemoglobin concentration below 11.0g/dl or packed cell volume (PCV) of less than 33.0% is regarded as anemia during pregnancy by the WHO. It occurs in 40-80% of the pregnant women. Iron and folic acid deficiencies, malaria, intestinal parasitic infections and hemoglobinopathies are the principal causes of anemia in pregnancy. Predisposing factors include young age, grand multiparity, low socioeconomic status, illiteracy, ignorance and short intervals of pregnancy. **AIM AND OBJECTIVES:** 1. To study various patterns of anemia in pregnant women having haemoglobin level < 11 gm%. 2. To determine the most common pattern of anemia in pregnancy based on red cell morphology. **MATERIALS AND METHODS:** This study is a prospective study over a period of one year from September 2014 to August 2015 in the department of pathology, Andhra medical college, Visakhapatnam. The study was conducted on 120 pregnant women whose haemoglobin level is <11 gm/dl. All the haematological parameters & peripheral blood smear stained by Leishman's stain were evaluated. Complete clinical & obstetric history was recorded. Socioeconomic status was also noted. **RESULTS:** Out of 120 cases of anemia, we found 47 patients (39.1%) having dimorphic anemia, 36(30%) – microcytic hypochromic anemia, 23(19.1%) - normocytic hypochromic anemia, 11(9.16%)- sickle cell anemia and 1(0.83%) case of pancytopenia. Maximum cases were seen in the age group of 21-30 years. 52 cases (43.3%) were primigravida and remaining 68 cases (56.6%) were gravida two to four. 20 cases (16.6%) were diagnosed in the first trimester, 38 cases (31.6%) in the second trimester & 62 cases (51.6%) in the third trimester. **CONCLUSION:** In conclusion, the common morphological patterns of anemia in this study are dimorphic anemia and microcytic hypochromic anemia. More common in the multigravida & in the third trimester of pregnancy. After the 1st trimester there is increased fetal demand & hemodilution effect and thus anemia occurs commonly in this period. The risk factors for anemia in this study are low socioeconomic status, multiparity & H/O complications during previous pregnancy. The socioeconomic conditions must be improved, early detection & good antenatal care to be provided for the prevention of anemia in pregnancy.

KEYWORDS: Anemia, Morphological patterns, Pregnancy.

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INTRODUCTION: Anemia is defined as haemoglobin level in the blood below the lower extreme of the normal range for the age and sex of the individual. According to WHO, the prevalence of anemia among pregnant women ranges from 65-75% in India.^{[1][2]} Nearly half of the global maternal deaths due to anemia occur in south asian countries.80% Of these contributed by India.^{[1][2]}

In India about 4-16% of maternal death is due to anemia.^[3] A hemoglobin concentration below 11.0g/dl or packed cell volume(PCV) of less than 33.0% is regarded as anemia during pregnancy by the WHO.WHO classified anemia in pregnancy: Mild anemia (Hb - 10.0 to 10.9 gm/dl), Moderate anemia (Hb -7 to 9.9 gm/dl) and severe anemia (Hb - <7gm/dl).^[4] This study was therefore conducted to: a) study various patterns of anemia in pregnant women having haemoglobin level less than 11 gm%. b) Determine the most common pattern of anemia in pregnancy based on red cell morphology. c) Study age wise distribution of anemic cases in pregnancy. d) To study gravida wise and trimester wise distribution of anemia and e) To determine the grade of anemia in pregnant women.

MATERIALS AND METHODS: This study is a prospective study over a period of 1 year from September 2014 to August 2015 in the department of Pathology, Andhra medical college, Visakhapatnam. The study was conducted on 120 pregnant women whose haemoglobin level is <11 gm/dl. All the haematological parameters obtained by automated haematology analyser. Peripheral blood smear stained by leishman's stain was examined. Sickle cell test was done by using freshly prepared 2% sodium metabisulphite solution. Hb electrophoresis done for sickling test positive cases for confirmation. Complete clinical and obstetric history was recorded. Socio economic status was also noted.

RESULTS: During the study period a total of 120 pregnant women presenting with anemia were evaluated. Out of 120 cases 102(85%) [Table 1 and Figure 1] were in 21-30yrs of age group. Dimorphic anemia (Figure 6) was the most common pattern of anaemia consisting 47(39.2%) [Table 2 and Figure 2] of all cases followed by Microcytic hypochromic anemia 36(30%) (Figure 7) and normocytic hypochromic anemia 23(19.2%) respectively. In this study 99 (82.5%) pregnant women were Gravida I & II [Table 3 and Figure 3]. Majority of anemia cases 52 (51.8%) were in women in third trimester [Table 4 and Figure 4]. Out of 120 cases 101(94.2%) cases have mild to moderate anemia [Table 5 and Figure 5]. Among 13 sickle cell anaemia cases 6 patients were in between 18-20yrs age group and rest were of 21-30 yrs.

DISCUSSION: Anemia in pregnancy constitutes a major public health problem in developing countries.^{[5][6]} Nearly half the pregnant women in the world are estimated to be anemic, 52% compared to 23% in industrialized countries.^{[5][7]} Mostly the prevalence of anemia is higher in pregnant women, as during pregnancy there is 50% increase of blood amount than normal.^[8] In our present study, maximum number of cases were observed between 21-30 years, constituting 85% which Correlates closely to observations by Ahmad N^[1] (51.8%) & Haniff J et al^[5] (91.5%). (Table 6)

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Advancing gestational age increase the risk of anaemia. In our present study, maximum number of cases were observed in the third trimester constituting (51.8%) which correlates with Rasheed P et al^[7] (50.2%). (Table 7)

In our present study we found 43.3% primigravida, 51.7% G2 to G3 & 5.0% of G4 which correlates with Haniff J et al.⁵ (Table 8). Majority of cases showed moderate anemia constituting (54.2%) that correlated with Ahmad N et al¹ (50.9%). (Table 9.) In our present study most of the pregnant women presented with fatigue, dyspnoea, pallor, paraesthesia and bilateral pitting pedal edema. Among these 19 cases had gross pallor on general examination. Few cases presented with molar pregnancy, pre-eclampsia and h/o previous abortions. 13 cases presented with joint pains, jaundice and h/o intra-uterine death of the foetus in previous pregnancies. The sickling test was positive in these 13 cases. Hb electrophoresis results were obtained in few cases, all of them were sickle cell homozygous (HbSS). Among the 13 pregnant women who were diagnosed as sickle cell anemia cases (Figure 9), we could follow only 3 cases as most of them were diagnosed during 11 trimester. Among 3 cases, 2 had good perinatal outcome and one had IUD.

The commonest red cell blood pictures among the patients studied were dimorphic (Figure 6) & microcytic hypochromic anaemias (Figure 7). Indicative of iron deficiency anemia & megaloblastic anemia (Figure 8). In this study anaemia is more common in the third trimester of pregnancy. After the 1st trimester there is increased fetal demand & hemodilution effect and thus anemia occurs commonly in this period. The picture of anaemia in developing countries virtually on vegetarian diets is different from what is seen in the developed countries. In tropical countries like India iron is depleted by the parasites & some is lost in the sweat.^[1] Like iron several other factors also keep the dietary haemopoietic principles like Vit B12 & Folic acid. During pregnancy there is increased foetal demand for both Iron & Vit B12 & folic acid.^[8] This explains the dimorphic blood picture commonly seen during pregnancy in India & other tropical countries.

CONCLUSION: This study has revealed that anaemia in pregnancy is still highly prevalent in our environment the common morphological patterns of anemia in this study are dimorphic anemia and microcytic hypochromic anemia strongly indicating the nutritional cause of anaemia. The study has also revealed that the most important risk factor for anaemia in pregnancy in this centre is low socioeconomic condition. Hence the importance of improving the socioeconomic conditions should be emphasized. Pre-conception counseling for couples planning for pregnancy is essential to create awareness about the risks of anemia in pregnancy both to the mother and the foetus. Early booking for antenatal care for early detection of anemia & timely institution of preventable measures like hematinics supplementation should also be emphasized. Further studies are indicated for determining the specific aetiological factors of anaemia in pregnancy.

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AGE IN YEARS	NUMBER OF PATIENTS	%
18-20	7	5.8
21-25	45	37.5
26-30	57	47.5
31-35	11	9.2
Total	120	100.0

Table 1: Age wise distribution of patients studied

PERIPHERAL SMEAR	NUMBER OF PATIENTS	%
Dimorphic anemia	47	39.2
Microcytic hypochromic anemia	36	30
Normocytic hypochromic anemia	23	19.2
Sickle cell anemia	13	10.8
Pancytopenia	1	0.8
Total	120	100.0

Table 2: Peripheral smear examination

OBSTETRIC INDEX	NUMBER OF PATIENTS	%
Gravida		
1	52	43.3

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11	47	39.2
111	15	12.5
1V	6	5.0
Total	120	100.0

Table 3: Gravida and anemia

TRIMESTER	NUMBER OF PATIENTS	%
1	20	16.6
11	38	31.6
111	62	51.8
Total	120	100.0

Table 4: Trimester and anemia

GRADE	NUMBER OF PATIENTS	%
Severe anemia	19	15.8
Moderate anemia	65	54.2
Mild anemia	36	30.0
Total	120	100.0

Table 5: Grade of anemia

Authors	18-20	21-25	26-30	31-35
Ahmad N	45.8%	30.9%	20.9%	2.36%
Haniff J et al	4.29%	53.6%	37.9%	4.2%
Present study	5.8%	37.5	47.5%	9.2%

Table 6

Authors	First trimester	Second trimester	Third trimester
Rasheed P	27.7%	37.3%	50.2%
Present study	16.6%	31.6%	51.8%

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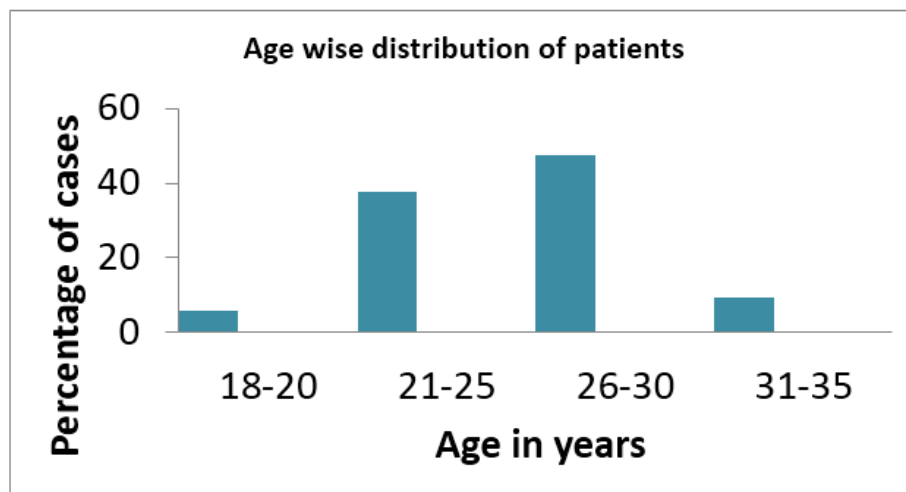
Table 7

Authors	G1	G2 toG3	G4
Haniff J et al	27.42%	62.77%	9.79%
Present study	43.3	51.7%	5.0%

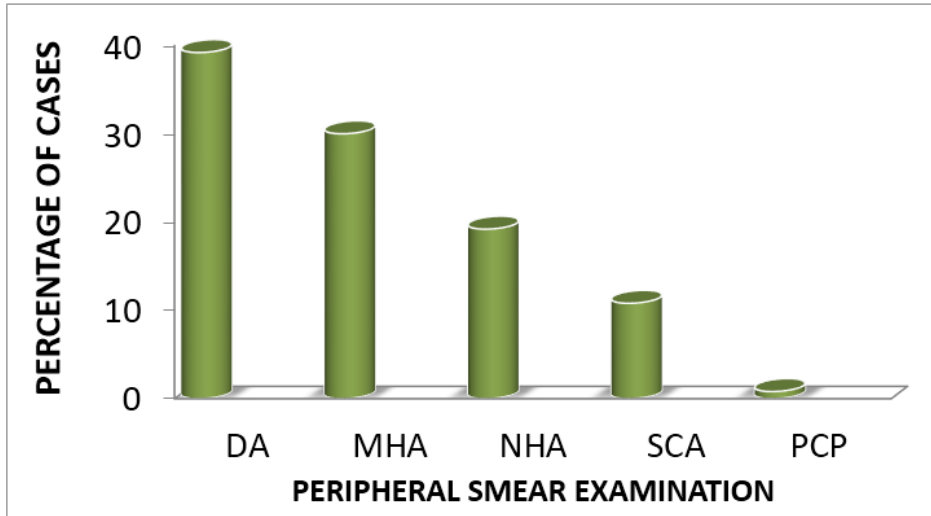
Table 8

Authors	Mild anemia	Moderate anemia	Severe anemia
Ahmad N	30.17%	50.9%	18.9%
Present study	30%	54.2%	15.8%

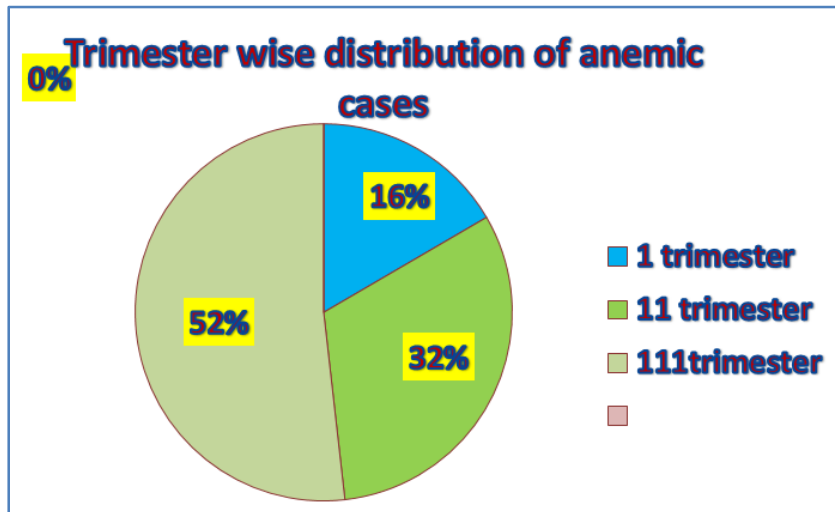
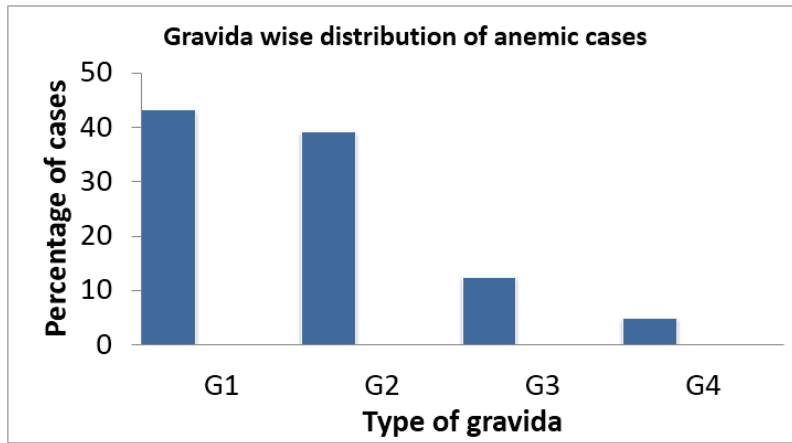
Table 9



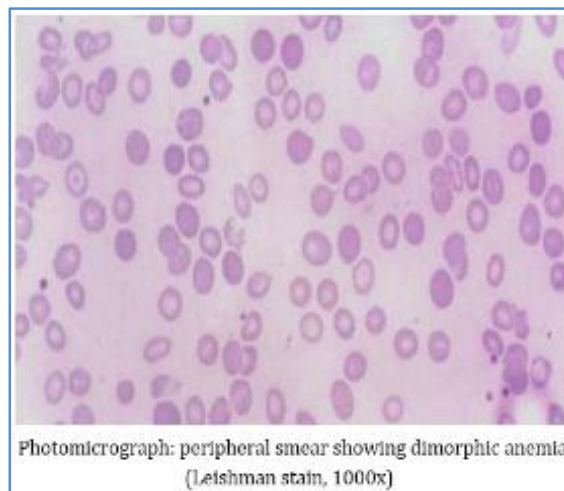
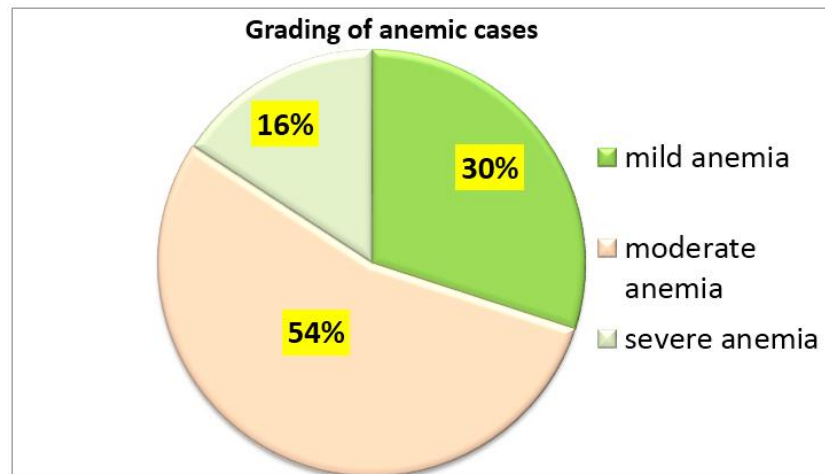
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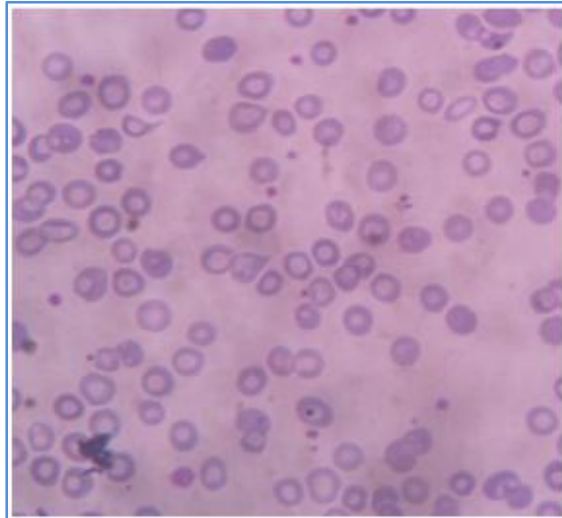
Distribution of patterns of anemia



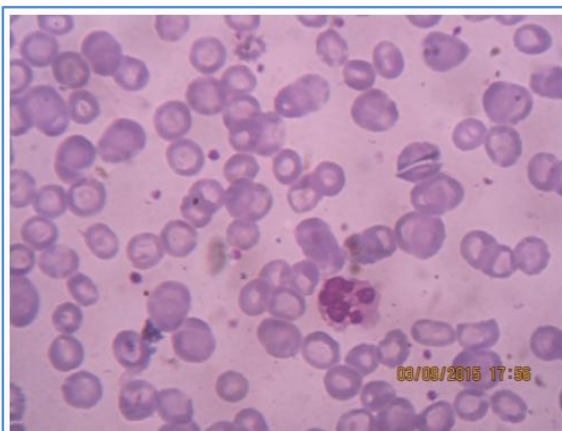
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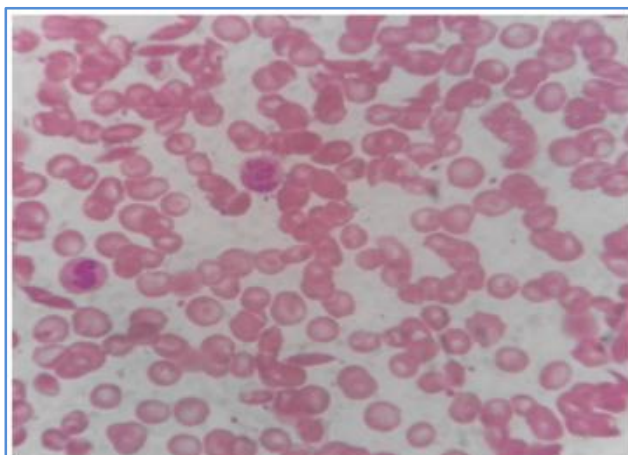
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Photomicrograph- microcytic hypochromic anemia showing tear drop cells (leishmanstain, 1000x)



Photomicrograph - macrocytic anemia with hypersegmented neutrophil (leishmanstain, 1000x)



Photomicrograph-sickle cell anemia with target cells (leishman stain, 1000x)

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AUTHORS:

1. Chamakuri Nirmala
2. I. Vijaya Bharathi
3. D. S. Arpitha
4. B. V. S. Kartheek
5. P. Sreevalli
6. A. Bhagyalakshmi

PARTICULARS OF CONTRIBUTORS:

1. Civil Assistant Surgeon, Government Hospital for Mental Care, Visakhapatnam.
2. Associate Professor, Department of Pathology, Andhra Medical College, Visakhapatnam.
3. 3rd Year Post Graduate, Department of Pathology, Andhra Medical College, Visakhapatnam.
4. Assistant Professor, Department of Pathology, Andhra Medical College, Visakhapatnam.

5. 2nd Year Post Graduate, Department of Pathology, Andhra Medical College, Visakhapatnam.
6. Professor & HOD, Department of Pathology, Andhra Medical College, Visakhapatnam.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. A. Bhagyalakshmi,
Professor & HOD,
Department of Pathology,
Andhra Medical College,
Visakhapatnam.
E-mail: dr.a.bhagyalaxmi@gmail.com

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