



Investigation Of Anaemia Patterns During Pregnancy

*A Clinicopathological Study at Smt. B.K. Shah Medical Institute and Research Centre, Sumandeep
Vidyapeeth, Pipariya, Waghodia, Vadodara.*

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I. INTRODUCTION:

A haemoglobin level in the blood that is below the lower end of the normal range for the person's age and sex is known as anaemia. In India, between 65 and 75 percent of pregnant women suffer from anaemia, according to the WHO.[1][2] South Asian nations account for nearly half of all maternal anaemia-related fatalities worldwide. India made almost 80% of these contributions.[1][2]

Anaemia accounts for 4–16% of maternal deaths in India.[3] According to the WHO, anaemia during pregnancy is defined as a haemoglobin concentration of less than 11.0 g/dl or a packed cell volume (PCV) of less than 33.0%. Pregnancy-related anaemia was categorised by the WHO as mild (Hb = 10.0 to 10.9 gm/dl), moderate (Hb = 7 to 9.9 gm/dl), and severe (Hb = <7 gm/dl).[4] Therefore, the purpose of this study was to: a) investigate different anaemia patterns in pregnant women with haemoglobin levels below 11 gm%. b) Using red cell morphology, identify the most prevalent pattern of anaemia during pregnancy. c) Examine the age distribution of pregnant anaemic cases. d) To investigate the distribution of anaemia by gravida and trimester, and e) To assess the severity of anaemia in expectant mothers.

II. MATERIAL AND METHOD:

This prospective study was conducted in the pathology department of SBKS MIRC Sumandeep Vidyapeeth, Dhiraj Hospital, Pipariya, Waghodia, Vadodara, over a six-month period, from June 2024 to November 2024. 120 pregnant women with haemoglobin levels below 11 gm/dl participated in the trial. The automatic haematology analyser yielded all of the haematological parameters.

A field-stained peripheral blood smear was analysed. A newly made 2% sodium metabisulphite solution was used to perform the sickle cell test. For confirmation, Hb electrophoresis is performed on sickling test-positive cases. The entire obstetric and clinical history was documented. Additionally, socioeconomic status was recorded.

III. RESULTS:

A total of 120 pregnant women who presented with anaemia were assessed during the study period. 102 (85%) of the 120 instances [Table 1 and Figure 1] involved people aged 21 to 30. The most prevalent pattern of anaemia was dimorphic anaemia (Figure 6), which accounted for 47 (39.2%) of all cases [Table 2 and Figure 2]. Microcytic hypochromic anaemia (36, 30%) and normocytic hypochromic anaemia (Figure 10) (23, 19.2%) came next, respectively. Gravida I & II were present in 99 (82.5%) of the pregnant women in this study [Table 3 and Figure 3]. Women in their third trimester accounted for the majority of anaemia cases, 52 (51.8%) [Table 4 and Figure 4]. Mild to moderate anaemia is present in 101 (94.2%) of the 120 cases [Table 5 and Figure 5]. Six of the 13 individuals with sickle cell anaemia were between the ages of 18 and 20, while the remaining patients were between the ages of 21 and 30.

Table 1: AGE WISE DISTRIBUTION OF PATIENTS STUDIED.

AGE IN YEARS	NUMBERS 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

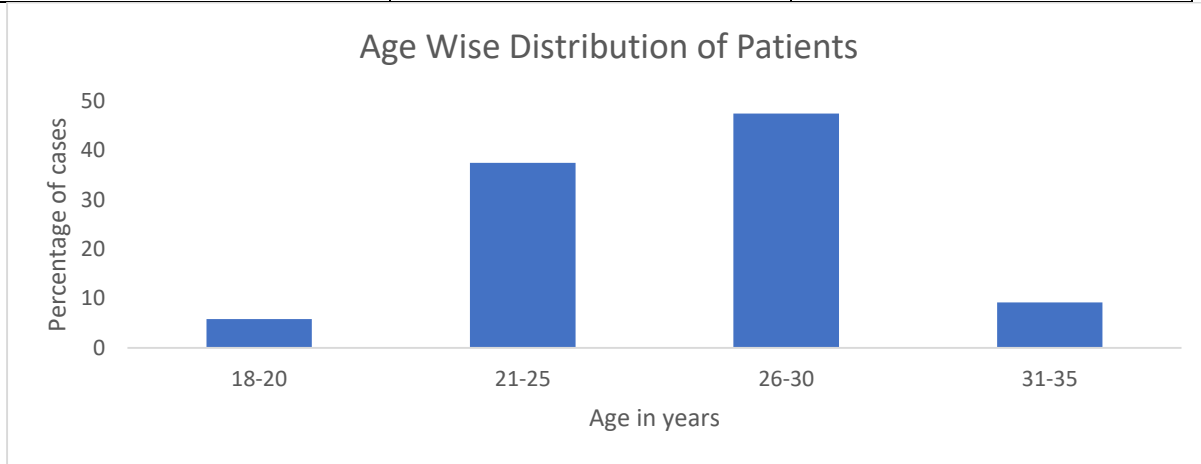


Figure 1: Age Wise Distribution of Patients

Table 2: PERIPHERAL SMEAR EXAMINATION.

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

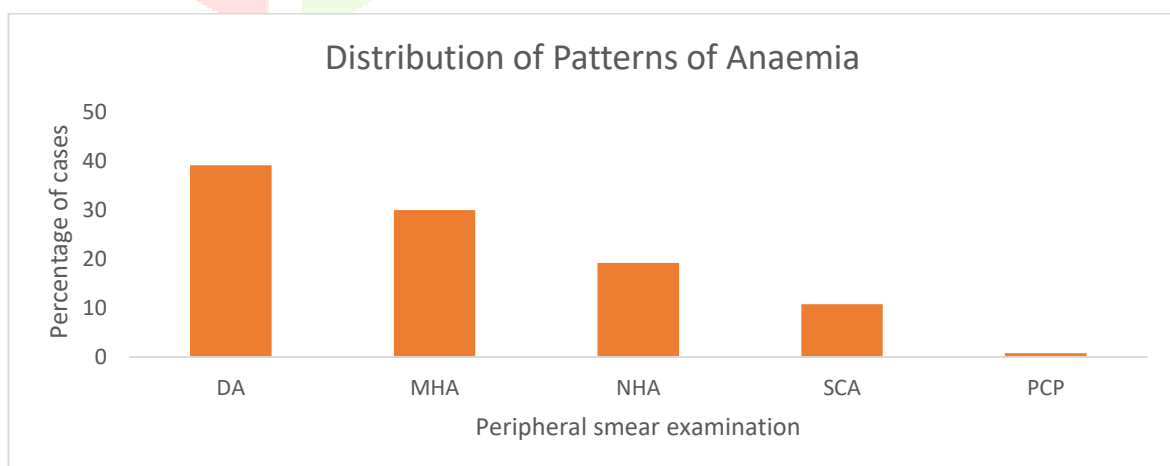


Figure 2: Distribution of Patterns of Anaemia.

Table 3: GRAVIDA AND ANAEMIA

OBSTETRIC INDEX	NUMBER OF PATIENTS	%
Gravida		
I	52	43.3
II	47	39.2
III	15	12.5
IV	6	5.0
Total	120	100.0

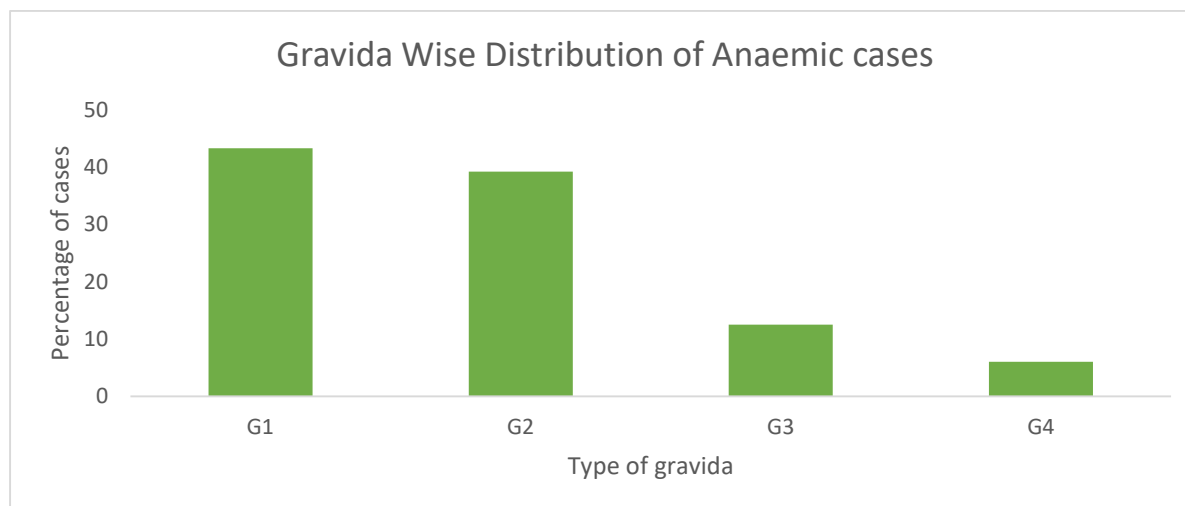


Figure 3: Gravida Wise Distribution of Anaemic cases

Table 4: TRIMESTER AND ANAEMIA

TRIMESTER	NUMBER OF PATIENTS	%
I	20	16.6
II	38	31.6
III	62	51.8
Total	120	100.0

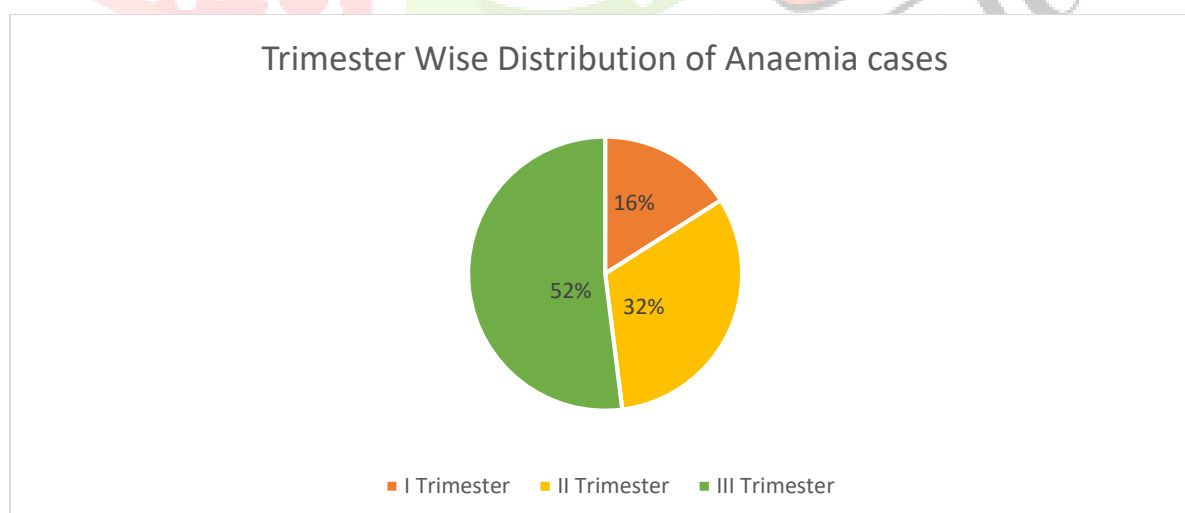


Figure 4: Trimester Wise Distribution of Anaemia cases.

Table 5: GRADE OF ANAEMIA

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

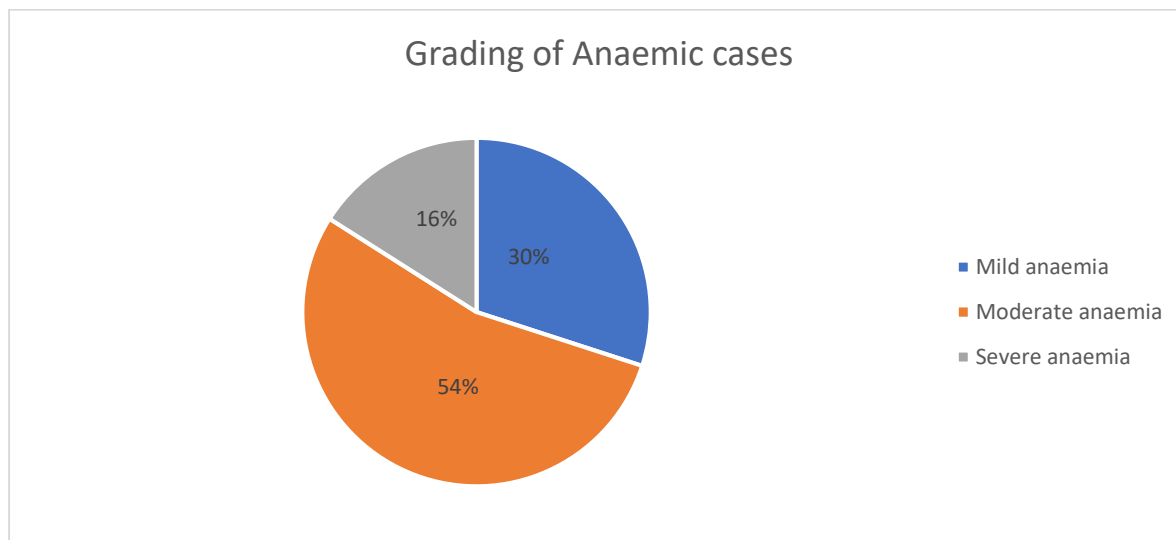


Figure 5: Grading of Anaemic cases.

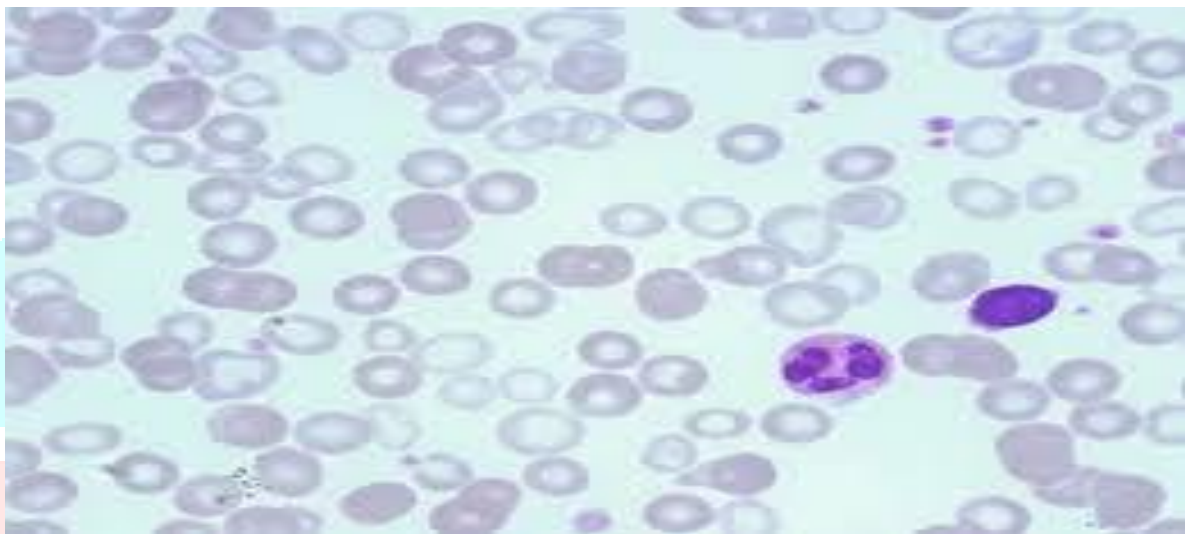


Figure 6: Photomicrograph: Peripheral smear showing Dimorphic anaemia (Field stain, 100x)

IV. DISCUSSION:

One of the biggest public health issues in underdeveloped nations is anaemia during pregnancy.[5][6] It is estimated that 52% of pregnant women worldwide are anaemic, compared to 23% in developed nations.[5][7] Because pregnancy causes a 50% increase in blood volume over normal, anaemia is more common in pregnant women. [8] The majority of instances (85%) in our current study occurred in people aged 21 to 30. This closely matches findings by Ahmad N [1] (51.8%) and Haniff J et al[5] (91.5%). (Table 6)

The risk of anaemia rises with increasing gestational age. The third trimester accounted for the greatest percentage of instances in our current study (51.8%), which is consistent with Rasheed P et al. [7] (50.2%). (Table 7)

According to Haniff J et al.5, we observed that 43.3% of the participants in our current study were primigravida, 51.7% were G2 to G3, and 5.0% were G4 (Table 8). The majority of individuals had mild anaemia, which is a component of (54.2%) that had a correlation with 50.9% for Ahmad N et al1. (Table 9). The majority of the pregnant women in our current study had bilateral pitting pedal oedema, tiredness, pallor, paraesthesia, and dyspnoea. A general examination revealed gross pallor in 19 of these individuals. A small number of cases had pre-eclampsia, molar pregnancy, and history of abortions. Thirteen individuals had joint discomfort, jaundice, and a history of foetal intrauterine mortality from prior pregnancies. In these 13 cases, the sickling test came back positive. Only a small number of patients had Hb electrophoresis results, and all of them were sickle cell homozygous (HbSS). Only three of the 13 pregnant women with sickle cell anaemia diagnoses (Figure 9) could be tracked down because the majority were identified in the eleventh trimester. Two of the three cases had positive perinatal outcomes, and one had an IUD.

The two most prevalent red cell blood types among the patients under study were microcytic hypochromic anaemias (Figure 7) and dimorphic anaemias (Figure 6). suggestive of megaloblastic anaemia and iron deficient anaemia (Figure 8). Anaemia is more prevalent in the third trimester of pregnancy. Anaemia is

frequent after the first trimester due to increasing foetal demand and the hemodilution effect. In developing nations, the prevalence of anaemia on vegetarian diets is essentially different from that in industrialised nations. Iron is lost through perspiration and parasites in tropical nations like India.[1] Similar to iron, a number of other elements, such as vitamin B12 and folic acid, maintain the dietary haemopoietic principles.

Pregnancy increases the fetus's need for iron, vitamin B12, and folic acid.[8] This explains why pregnant women in India and other tropical nations frequently have dimorphic blood pictures.

Table 6: Findings of other study and present study according to the age

AUTHORS	18-20	21-25	26-30	31-35
Ahmad N [1]	45.8%	30.9%	20.9%	2.36%
Haniff J et al [5]	4.29%	53.6%	37.9%	4.2%
Present study	5.8%	37.5%	47.5%	9.2%

Table 7: Findings of other study and present study according to the trimester

AUTHORS	FIRST TRIMESTER	SECOND TRIMESTER	THIRD TRIMESTER
Rasheed P [7]	27.7%	37.3%	50.2%
Present study	16.6%	31.6%	51.8%

Table 8: Findings of other study and present study according to the gravida

AUTHORS	G1	G2 TO G3	G4
Haniff J et al [5]	27.42%	62.77%	9.79%
Present study	43.3%	51.7%	5.0%

Table 9: Findings of other study and present study according to the severity of anaemia

AUTHORS	MILD ANAMEIA	MODERATE ANAEMIA	SEVERE ANAEMIA
Ahmad N [1]	30.17%	50.9%	18.9%
Present study	30%	54.2%	15.8%

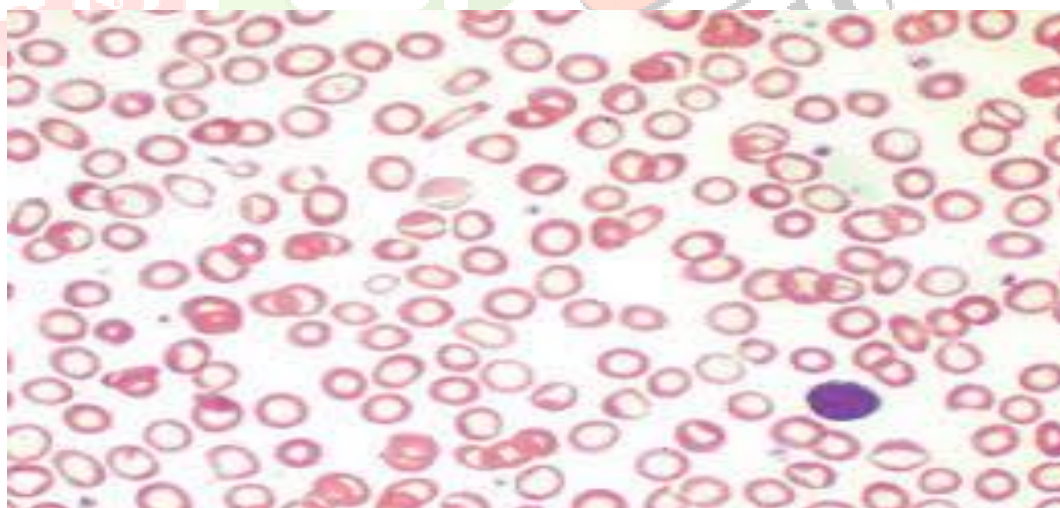


Figure 7: Photomicrograph: Peripheral smear showing microcytic hypochromic anaemia (Field stain, 100x)

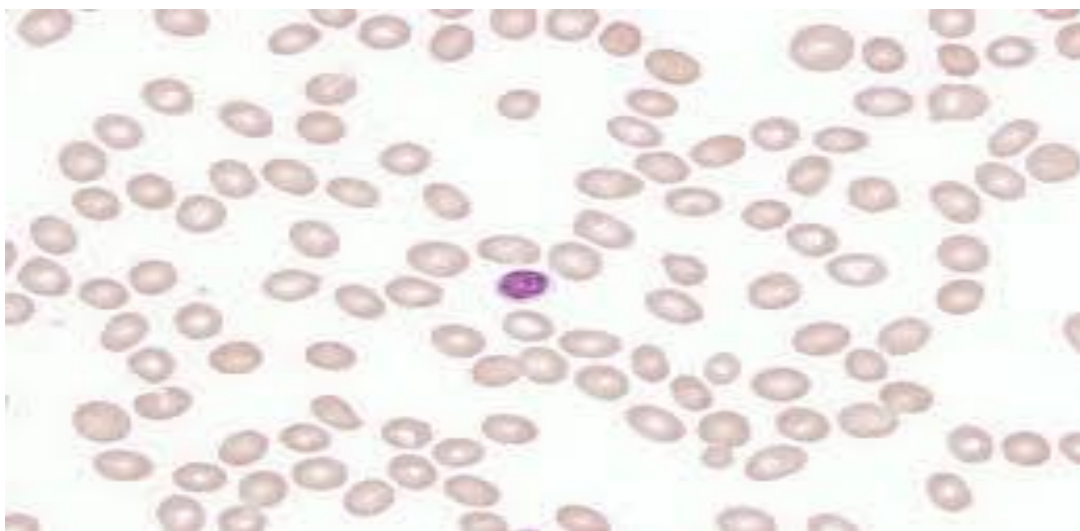


Figure 8: Photomicrograph: Peripheral smear showing macrocytic anaemia (Field stain, 100x)

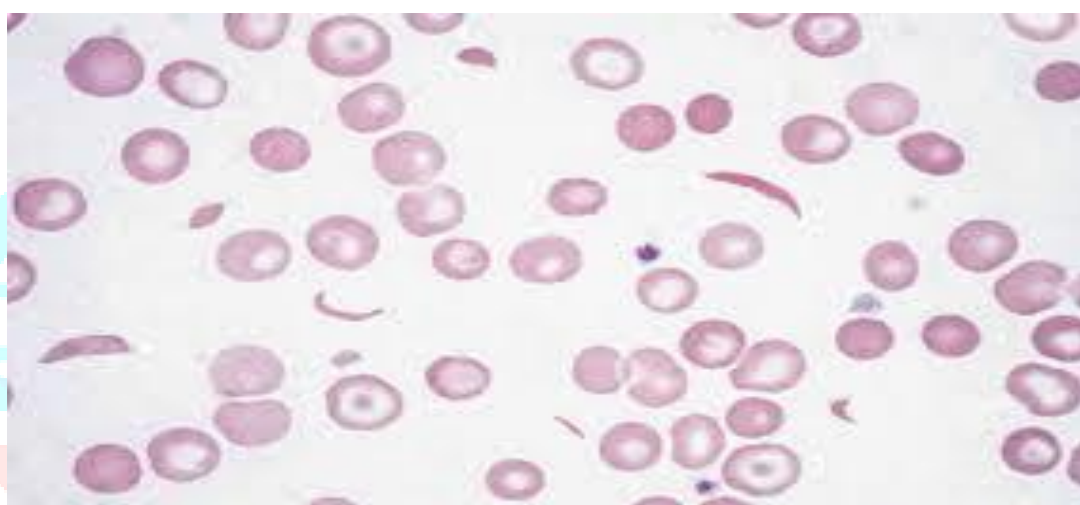


Figure 9: Photomicrograph: Peripheral smear showing sickle cell anaemia (Field stain, 100x)

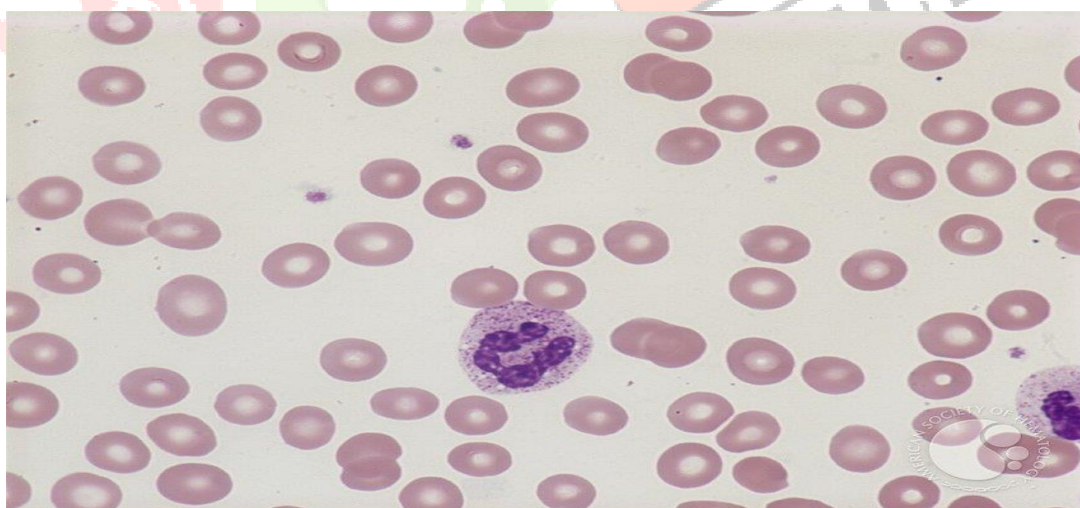


Figure 10: Photomicrograph: Peripheral smear showing normocytic hypochromic anaemia (Field stain, 100x)

V. CONCLUSION:

According to this study, anaemia during pregnancy is still very common in our society. The two most common morphological types of anaemia found in this study are dimorphic anaemia and microcytic hypochromic anaemia, which both clearly suggest that nutrition is the cause of anaemia. The study also found that low socioeconomic status is the main risk factor for anaemia during pregnancy in this centre. Therefore, it is crucial to stress how important it is to improve socioeconomic situations. Couples' pre-conception

counselling Pregnancy planning is crucial to raising awareness of the dangers, anaemia poses to the foetus and the mother. It should also be stressed to schedule prenatal care in advance in order to detect anaemia early and to promptly implement preventative measures such hematinics supplementation. To identify the precise aetiological reasons of anaemia in pregnancy, more research is necessary.

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