Study of Peripheral Blood Smear Examination with Hemoglobin Estimation in Pregnant Women Attending The Antenatal Clinic

Dr. Amit Agravat	Associate Professor of Pathology, DEPARTMENT OF PATHOLOGY, P. D. U. MEDICAL COLLEGE & HOSPITAL, RAJKOT, INDIA
Dr. Gauravi Dhruva	Professor & Head of the Department of Pathology, DEPARTMENT OF PATHOLOGY, P. D. U. MEDICAL COLLEGE & HOSPITAL, RAJKOT, INDIA
* Dr. Khyati Mehta	Second year resident doctor, DEPARTMENT OF PATHOLOGY, P. D. U. MEDICAL COLLEGE & HOSPITAL, RAJKOT, INDIA * Corresponding Author
Dr. Nisha parmar	Second year resident doctor, DEPARTMENT OF PATHOLOGY, P. D. U. MEDICAL COLLEGE & HOSPITAL, RAJKOT, INDIA
Dr. Rutvi Dave	Third year resident doctor, DEPARTMENT OF PATHOLOGY, P. D. U. MEDICAL COLLEGE & HOSPITAL, RAJKOT, INDIA

ABSTRACT

Background: Anemia is defined as decreased hemoglobin level, or circulating red blood cells and it is the most common hematological disorder during pregnancy. There are different types of anemia commonest being iron deficiency anemia which affect mostly pregnant and lactating women and children in developing countries. Present study was conducted at P. D. U. Hospital, Rajkot.

Aims and objectives : 1) to find out the prevalence of anemia of different types, 2) to grade the severity of anemia, 3) to detect any other abnormality.

Methods : In Present study, 100 pregnant women attending antenatal out patient department, obstetric and gynecology department were selected as subjects. After taking detailed history (including age, gravid status, trimester status, chief complains), preliminary blood tests like complete blood count by automated cell counter (nihon kohden) and peripheral smear examination was performed.

Results : Pregnant women attending the antenatal clinic were selected. Total 100 pregnant women of 15 to 35 years of age have been studied. Among them, 48 (48 %) women were anemic. Out of 100 women, 36(36%) women were having hypochromic microcytic peripheral blood smear, 1(1%) woman was having normochromic macrocytic peripheral blood smear and 63(63%) women were having normochromic normocytic peripheral blood smear. Among 100 women, 39 women were having 1st trimester pregnancy, 40 women were having 2nd trimester pregnancy and 21 women were having 3rd trimester pregnancy. Among those having 1st trimester pregnancy, 23(58.97%) women were having normochromic normocytic peripheral blood smear, 15(38.46%) having hypochromic microcytic peripheral blood smear and 1 (2.56%) was having macrocytic peripheral blood smear. Among those having 2nd trimester pregnancy, 30(75%) women were having normochromic normocytic peripheral blood smear, 10(25%) women were having hypochromic microcytic peripheral blood smear. Among those having 3rd trimester pregnancy, 10 (47.61%) women were having normochromic normocytic peripheral blood smear and 11 (52.38%) women were having hypochromic microcytic peripheral blood smear.

INTRODUCTION

Anemia is defined as a clinical entity characterized by reduction in hemoglobin concentration below normal for age, sex, physiological condition [1]. WHO has estimated that prevalence of anemia in pregnant women as 14% in developed and 51% in developing countries and 65-75% in India. About one third of the global population (over 2 billion) is anemic. Prevalence of anemia in all the groups is higher in India as compared to other developing countries [2]. In India, 19 % of maternal deaths are related to anemia [3]. Maternal anemia increases intrauterine growth retardation and pre-term delivery [4]. Worldwide an estimated 51% of pregnant women suffer from anemia almost twice as many as non pregnant women [5].

A hemoglobin concentration ([Hb]) of < 11.0 g/dl is commonly taken as indicator of anemia in pregnancy [6]. It may be due to inadequate iron or folic acid/vitamin b12 deficiency or it may be due to blood loss or some other chronic disease [7]. Depending upon the cause, its morphology vary in peripheral blood smear. It may be hypochromic microcytic, normochromic macrocytic and normochromic normocytic peripheral blood smear. Iron deficiency is the most common cause of anemia. Inadequate intake or absorption of iron is associated with increased risks of maternal mortality and morbidity. In pregnancy, anemia has a significant impact on the health of the foetus as well as that of the mother. Foetuses are at risk of preterm deliveries, low birth weights, morbidity and perinatal mortality due to the impairment of oxygen delivery to placenta and foetus. Thus, routine screening tests for anemia are recommended in pregnant women.

The diagnosis of anemia in pregnancy is difficult to establish based on clinical picture alone, yet it is important that treatment be initiated early because of the high mortality associated with anemia during pregnancy. Keeping all these facts in view, the current study was designed to examine the peripheral blood smear in pregnant women to determine the cause of anemia.

METHODS AND MATERIALS

Present study was conducted in Pathology Department of P. D. U. Medical College & Hospital, Rajkot, Gujarat. A total of 100 pregnant women, attending to antenatal clinic, obstetrics and gynecology department were studied. In all cases, patient age, clinical history (including chief complaints, gravid status, trimester status), and preliminary complete blood count and peripheral blood smear examination were recorded in proforma. Inclusion criteria: All pregnant women of 15 to 35 years of age attending the antenatal clinic were included. The samples were collected in an ethylenediaminetetraacetic acid (EDTA) vaccutte and sent along with the requisition form to the laboratory.

RESULTS

This study was carried out on a total 100 cases of pregnant women attending to antenatal out patient department, obstetric and gynecology department of P. D. U. Medical College & Hospital, Rajkot. Out of 100 cases of pregnant women, 23(23%) women belonged to the age group 15-20 years, 45(45%) women belonged to the age group 21-25 years, 26(26%) women belonged

to the age group 26-30 years and 6(6%) women belonged to the age group 31-35 years.

TABLE 1 : PREVALENCE OF ANEMIA AMONG PREGNANT WOMEN

Total no. of cases	Total no. of anemic women	Percentage of anemic women
100	48	48

Out of 100 pregnant women, 48% of women was found to be anemic, 52% of women were non-anemic.

After finding out the prevalence of anemia, data was classified according to peripheral blood smear morphology and it was found that, smear of 63% of women were normochromic nor-mocytic type and 36% of women were hypochromic microcytic type and 1% of women were normochromic macrocytic type .[figure 1]
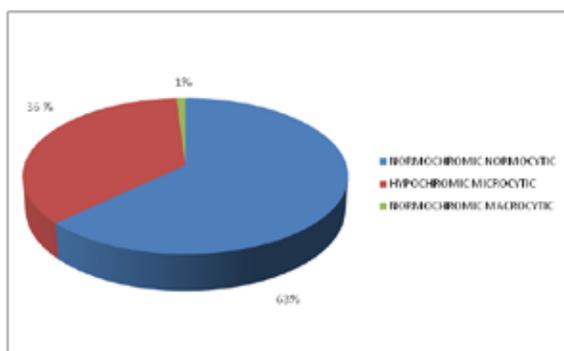
FIGURE 1 : DIFFERENT TYPES OF RBC MORPHOLOGY IN PERIPHERAL BLOOD SMEAR OF PREGNANT WOMEN
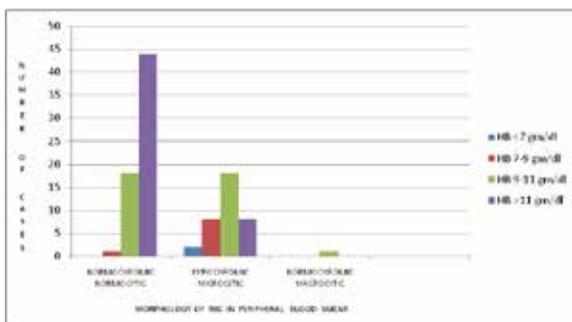

FIGURE 2 : DISTRIBUTION ACCORDING TO MORPHOLOGY OF RBC IN PERIPHERAL BLOOD SMEAR AND SEVERITY OF ANEMIA

Among 100 pregnant women, 2 (2%) women were severely ane-mic, 9(9%) women were moderately anemic and 37(37%) women were mildly anemic and 52(52%) women were non-anemic.

TABLE 2 : PERIPHERAL BLOOD SMEAR FINDING IN DIF-FERENT AGE GROUPS AMONG PREGNANT WOMEN

PERIPHERAL SMEAR FINDING	Age of the woman in years				TOTAL
	<= 20	21-25	26-30	31-35	
NORMOCHROMIC NORMOCYTIC	15	28	16	4	63
HYPOCHROMIC MICROCYTIC	8	16	10	2	36
NORMOCHROMIC MACROCYTIC	0	1	0	0	1
TOTAL	23	45	26	6	100
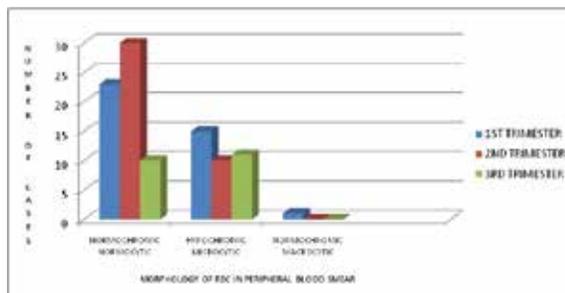
FIGURE 3 : TRIMESTER WISE DISTRIBUTION OF PREG-NANT WOMEN

Among those having 1st trimester pregnancy, 23(58.97%) women were having normochromic normocytic peripheral blood smear, 15(38.46%)women were having hypochromic microcytic periph-eral blood smear and 1(2.56%) woman was having normochro-mic macrocytic peripheral blood smear. Among those having 2nd trimester pregnancy, 30 (75%) women were having normochro-mic normocytic peripheral blood smear and 10 (25%) women were having hypochromic microcytic peripheral blood smear. Among those having 3rd trimester pregnancy, 10 (47.61%) women were having normochromic normocytic peripheral blood smear and 11(52.38%)women were having hypochromic microcytic pe-ripheral blood smear .

TABLE 3 : DISTRIBUTION ACCORDING TO GRAVID STATUS OF PREGNANT WOMEN

GRAVID STATUS	PERIPHERAL BLOOD SMEAR MORPHOLOGY			TOTAL
	NORMOCHROMIC NORMOCYTIC	HYPOCHROMIC MICROCYTIC	NORMOCHROMIC MACROCYTIC	
PRIMIGRAVIDA	44	22	1	67
MULTIGRAVIDA	19	14	0	33
TOTAL	63	36	1	100

After classifiying the data according to gravida status , it was found that iron deficiency was more among the multi-gravida women (42.42%) as compared to primi-gravida (32.83%).

TABLE 4 : PREVALENCE OF ANEMIA IN PREGNANT WOMEN ACCORDING TO SOCIO-ECONOMIC STATUS

SOCIO-ECONOMIC STATUS	ANEMIC WOMEN	NON ANEMIC WOMEN	TOTAL
HIGH SOCIO-ECONOMIC STATUS	17	46	63
LOW SOCIO –ECONOMIC STATUS	31	6	37
TOTAL	48	52	100

The prevalence of anemia was much more in women belonging to low socio-economic status (83.78%) as compared to women belonging to high socio-economic status(26.98 %) because of less health awareness, extreme poverty, less facilities like medi-cal services etc.

CONCLUSION
To conclude, it can be said that the peripheral smear examina-

tion can be easily performed and when properly interpreted along with Hemoglobin estimation, as suggested in this study, it can aid in early recognition of type of anemia and treatment of anemia during pregnancy. In addition, other significant abnormality if present can be detected early.

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