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TO STUDY THE HEMATOLOGICAL PARAMETER IN ALL PREGNANT WOMEN IN DIFFERENT TRIMESTER OF PREGNANCY AND COMPARE THEM WITH HEALTHY NON PREGNANT WOMEN

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Abstract

Background & Method: The study was carried out on pregnant women attending Outpatient department of Obstetrics and Gynecology in Amaltas Institute of Medical Sciences, Dewas, Madhya Pradesh. 400 consecutive blood samples of pregnant women's as study group and 400 consecutive blood samples of non-pregnant women's as control group, were included in the study.

Result: Primary blood indices (RBC, hemoglobin and hematocrit) of the study population. Hemoglobulin content and hematocrit value were significantly lower in pregnant women compared to non-pregnant women. And RBC count is also lower in pregnant women as compared to non-pregnant women. Secondary blood indices (MCV, MCH and MCHC) of the study population, secondary blood indices of the study population, there was no significant change in MCV among pregnant and non-pregnant women. On the other hand, MCHC and MHC showed significant decrease in pregnant women.

Conclusion: White blood cells and neutrophils were progressively increased whereas lymphocyte count, RBC count, hemoglobin, hematocrit, MCHC and platelet were decreased in pregnant women compared to non-pregnant women as pregnancy advanced. More direct dependence on hemoglobin for pregnant women in their second and third trimesters, along with a more aggressive approach to the level of iron stores at which iron supplementation should be prescribed.

Keywords: hematological, pregnancy, healthy & women.
Study Designed: Cross Sectional Study.

Introduction

Traditionally, medical professionals have measured pregnancy from a number of convenient points, including the day of last menstruation, ovulation, fertilization, implantation and chemical detection. In medicine, pregnancy is often defined as beginning when the developing embryo becomes implanted in the endometrial lining of a woman's uterus. The first 12 weeks of pregnancy are considered to make up the first trimester[1].

During the first trimester the body undergoes many changes. Hormonal changes affect almost every organ system in the body. These changes can trigger symptoms even in the very first weeks of pregnancy[2].

Fetal development during the first trimester begins with multiplying of zygote and forming of a blastocyst in the first week. During the second week, the blastocyst burrows into the uterine lining. Structures that feed and protect the developing organism begin to form amnion, chorion, yolk sac, placenta, and umbilical cord. In the third and four weeks, primitive brain and spinal cord appear. Heart, muscles, ribs, backbone, and digestive tract begin to develop and the embryo becomes 6 mm in length. During 5-8 weeks, many external body structures (face, arms, legs, toes, fingers) and internal organs form[3]. The sense of touch begins to develop, and the embryo can move where it becomes 2.5 cm in length. During 9-12 weeks, rapid increase in size begins. Nervous system, organs, and muscles become organized and connected, and new behavioral capacities (kicking, thumb sucking, mouth opening, and rehearsal of breathing) appear[4]. External genitals are well-formed, and the fetus's sex is evident. The embryo becomes 7.5 cm in length[5].

Material & Method

The study was carried out on pregnant women attending Outpatient department of Obstetrics and Gynecology in Amaltas Institute of Medical Sciences, Dewas, Madhya Pradesh. It is a cross sectional study entitled "To study the hematological parameter in all pregnant women in different trimester of pregnancy and compare them with healthy non pregnant women", study was done from Oct. 2018 to Sep. 2019 in Pathology Dept.

400 consecutive blood samples of pregnant women's as study group and 400 consecutive blood samples of non-pregnant women's as control group, were included in the study. Each blood sample was mixed well and then approximately 20 µL was aspirated by allowing the analyzer's sampling probe into the blood sample and depressing the start button. Results of the analysis were displayed after about 30 seconds, after which the analyzer

generated a paper copy of the results on thermal printing paper.

INCLUSION CRITERIA

1. Women's of 20 to 40 years attending antenatal clinic of Amaltas Institute of Medical Sciences, Dewas was selected.

2. Women's giving urine pregnancy test positive or are positive for live fetus in ultrasonography was included in our study as study group and who are negative for the same was taken as control group.

EXCLUSION CRITERIA

Patient with

- Bleeding disorders
- Splenomegaly
- Connective tissue disease such as systemic lupus erythematosus
- Hypertension
- Human immunodeficiency virus (HIV)
- Hepatitis B infection
- Women on non-steroidal anti-inflammatory drugs such as aspirin were also excluded.

Results

Table 1: Distribution of patients according to age group

(N=800)

Age Group	Case Group		Control Group	
	No.	%	No.	%
<= 20 years	95	23.75	63	19.75
21-30 years	263	65.75	266	66.13
31-40 years	42	10.50	71	14.13
Total	400	100.0	400	100.00

Table 2: Comparison of Hematological value between the two Groups

(N=800)

Parameter	Case Group (n=400) (Mean ± SD)	Control Group (n=400) (Mean ± SD)	't' Value	P Value
WBC	9881 ± 3759	8729 ± 21.89	5.30 df=798	0.000*
HGB	10.27 ± 1.90	12.64 ± 0.78	-23.02 df=798	0.000*
RBC	4.23 ± 0.62	4.29 ± 0.55	-1.50 df=798	0.133
HCT	32.52 ± 5.08	34.6 ± 15.3	-2.57 df=798	0.010*
MCV	77.33 ± 9.53	76.78 ± 7.59	0.91 df=798	0.366
MCH	25.26 ± 4.03	26.99 ± 3.82	-6.25 df=798	0.000*
MCHC	32.56 ± 2.47	34.24 ± 2.20	-10.22 df=798	0.000*
Platelet	1.99 ± 0.70	2.93 ± 0.58	-20.75 df=798	0.000*
Neutrophil	73.06 ± 7.98	64.86 ± 6.10	16.33 df=798	0.000*
Lymphocyte	21.62 ± 7.07	27.54 ± 6.19	-12.61 df=798	0.000*
Monocytes	3.41 ± 1.38	4.75 ± 1.20	-14.73 df=798	0.000*
Eosinophil	1.94 ± 2.06	3.00 ± 1.19	-8.96 df=798	0.000*
Basophil	0.00 ± 0.00	0.00 ± 0.00	-	-

Unpaired 't' test. * - Significant difference.

Primary blood indices (RBC, hemoglobin and hematocrit) of the study population. Hemoglobulin content and hematocrit value were significantly lower in pregnant women compared to non-pregnant women. And RBC count is also lower in pregnant women as compared to non-pregnant women.

Secondary blood indices (MCV, MCH and MCHC) of the study population, secondary blood indices of the study population, there was no significant change in MCV among pregnant and non-pregnant women. On the other hand, MCHC and MHC showed significant decrease in pregnant women.

Table 3: Distribution of case group patients according to trimester

(N=400)

Trimester	No.	%
First Trimester	156	39.00
Second trimester	155	38.75
Third trimester	89	22.25
Total	400	100.00

As indicated inn table 3 out of 400 pregnant women 156 (39%), 155 (38.75%), 89 (22.25%) were respectively from first, second and third trimester.

Discussion

White blood cells and neutrophil were progressively increased whereas lymphocyte count was decreased in pregnant women compared to non- pregnant women as pregnancy proceeded. Such findings are in concurrent with that obtained by James et al. (2008)[6] and Osonuga et al. (2011)[7]. Also findings are consistent with previous study which reported that the decreases in hemoglobin and red cell indices concentration are common findings during pregnancy and results from increased plasma volume combined poor iron intake (Ruchi et al. 2013)[8].

We found significant increased WBC count significant higher compared to that of the controls. The finding in agreement with previous study reported that total leukocyte count rising in early pregnancy and remained elevated through pregnancy. This may be as a result of the body building the immunity of the fetus and it is achieved by a state of selective immune tolerance, in the presence of a strong antimicrobial immunity. Similarly to the previous study reported that pregnancy leucocytosis, primarilyrelated to increased circulation of neutrophils in the second month of pregnancy (Rouse et al., 1998)[9].

Conclusion

White blood cells and neutrophils were progressively increased whereas lymphocyte count, RBC count, hemoglobin, hematocrit, MCHC and platelet were decreased in pregnant women compared to non-pregnant women as pregnancy advanced. More direct dependence on hemoglobin for pregnant women in their second and third trimesters, along with a more aggressive approach to the level of iron stores at which iron supplementation should be prescribed.

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