



### Original Research Article

## Study of White Blood Corpuscles Count in Different Phase of Menstrual Cycle, of Female Attending in Tertiary Care Hospital at ESI-PGIMSR, Basaidairpur

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### Abstract

**Objective:** *The Present Study was undertaken to know the periodical variation of leukocyte count in different phase of menstrual cycle.*

**Material and Methods:** *A total of 38 healthy female in the age group of 16-28 years with regular cycles of 28±2 days duration were studied.*

**Result:** *There was significant increase in total leukocytes count during secretory phase. In differential leukocytes count, there was a significant increase in the Neutrophil count during secretory phase, lymphocyte was increased in menstrual and secretory phase, monocyte count more on proliferative phase but show no significance, In Eosinophil count there was not much changes in all the three phases.*

**Conclusion:** *This study was attempted to determine the normal variation in the leucocytes count during the different phase of menstrual cycle which may help in understanding various disorders.*

**Keywords:** *Menstrual cycle, leukocytes count, secretory phase, periodicity.*

### Introduction

Menstrual cycle is the cyclical phenomenon characterized by periodical vaginal bleeding, occurring during the reproductive life of a female that involves a patterned sequence of structural, functional and hormonal system, influencing all the systems of body. A normal menstrual cycle lasts from 21 to 35 days with average of 28 days, having 2 to 6 days of flow with average blood loss of 20 to 60 ml. The menstrual cycle is regulated of pituitary- ovarian axis.

The endometrium is stimulated and regulate by ovarian steroid hormone like estrogen and progesterone which in turn controlled by integrated hypothalamic pituitary-ovarian axis through the release of follicle stimulating hormone (FSH) and Luteinizing hormone (LH). Various studies shows that changes of Leukocyte count during different phase of menstrual cycle but results have been inconclusive and contradictory. Hence the present study was taken

up to study the variations in leucocytes count during different phases of menstrual cycle.

### Materials and Methods

Present study was conducted in the Department of obstetrics and Gynecology, ESI - PGIMSR, Basaidairpur, during the period of August 2014 to October 2015. A total of 38 Healthy female, aged between 16 to 28 years with normal menstrual cycle  $28 \pm 2$  days duration were included in the study. Female with Irregular cycles, Gynecological disorders, Anemia, history of drug intake affecting menstrual cycle or history of chronic disorder and fever at the time of sampling were excluded from the study. Study protocols were explained and informed consent was obtained from each female. Experimentation was carried in accordance with ethical standards.

First sample was collected within 48 hours of onset of menstruation (during secretory phase) second sample during 8<sup>th</sup>-10<sup>th</sup> days of menstrual

cycle (during proliferative phase) and third sample was taken during 22<sup>nd</sup>-24<sup>th</sup> days of menstrual cycle (during secondary phase). All the female were followed up during a single cycle. Samples were taken preferably at morning time at 9-10 am. Total leucocytes count were made under improved Neubauer's chamber using Turk's fluid and differential count by using Leishman's stain under compound microscope.

### Results

Total leukocyte count was increased in secretory phase. There was a rise in Neutrophil percentage during secretory and menstrual phase compare to proliferative phase. Lymphocyte count was increased during menstrual phase and in secretory cycle but decrease in proliferative phase. No changes were observed in Eosinophil count. In proliferative phase there were increased in Monocyte count.

**Table -1** Shows Total Leukocyte count during different phase of menstrual cycle

No. of Female	Parameter	Menstrual Phase	Proliferative Phase	Secretory Phase
38	Total Leucocytes count (TLC)	6578	6352	8685

**Table-2** Shows Differential Leucocytes count during different phase of menstrual cycle

Differential count%	Menstrual Phase (2 <sup>nd</sup> day)	Proliferative Phase (6 <sup>th</sup> -9 <sup>th</sup> day)	Secretory Phase (22 <sup>nd</sup> to 24 <sup>th</sup> day)
Neutrophil	63%	56%	65%
Lymphocyte	33%	22%	35%
Eosinophil	1.48%	1.31%	1.5%
Monocyte	1.4%	2.5%	1.4%
Basophil	0%	0%	0%

### Discussion

Menstrual cycle is a complex and regular process and controlled by hypothalamo pituitary ovarian axis. Total leucocytes count was increased in the present study during secretory phase and may be due to increase in all the subpopulations of leucocytes. This study is similar to studies done by Mathur et. al and Tikare et al. Another study conducted by Ranjee et. al revealed that total leukocyte were increased from menstrual phase to proliferative phase and maximum level occurred around mid cycle. But some other studies showed

no change in the number of circulating leucocytes in relation to the menstrual cycle. In the present study, Neutrophil percentage was increased and may be due to the hormonal changes in the ovaries. Some studies have suggested that estrogen enhances granulocyte proliferation and may promote the release of neutrophil from bone marrow rather than from marginated pool. Progesterone that is secreted by ovaries regulates the neutrophil count. Eosinophil count was increased in menstrual phase as compare to other phases. But in other studies where there was a

significant decrease count during mid cycle followed by rise in secretory phase, which occurred in response to physiological stress and increased level of steroid hormone in blood causing eosinopenia.

Lymphocyte count was increased in secretory phase and this may be due to increase in T helper cells, cytotoxic T-cells and NK cells, that occur due to the influence of steroids but several studies has showed decrease lymphocyte count in secretory phase. The monocyte was increase in proliferative phase. These may be due to increase in granulocyte and Monocyte and due to increased 17a estradiol concentration. Basophil count was zero in different phases of the cycle but in other study Basophil count decreased in secretory and menstrual phase which was probably due to migration of the cells from the peripheral blood into the rupturing follicle of ovary and into the ischaemic endometrium.

### Conclusion

This study shows changes in Total leucocytes count and differential leukocyte count during the different phase of the menstrual cycle and gives the idea about various disorders occurring in females related to periodical variations.

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