Chapter 6

Summary and Conclusion
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During the last few decades, a lot of research work is being carried out in order to find out the reason behind the gender differences regarding human diseases. This difference is well noticed in cardiovascular diseases, abnormalities of coagulation and in respiratory responses. It is generally believed that apart from the genetic factors, these differences are brought about mainly by the sex hormones – a unit of which is formed by the hypothalamic hormone, GnRH, anterior pituitary hormones LH and FSH and the ovarian sex steroids, estrogen and progesterone in females. Also, gender differences in the respiratory responses are well established nowadays. To identify the abnormalities in the respiratory process, a better knowledge of the normal ventilatory process, associated with haematological or hormonal condition is highly essential. With this concept in mind, the present study was designed to examine the respiratory, biochemical, haematological and hormonal levels with menstrual cycle status in normal healthy women of reproductive age.

Lung volumes and flow rates were evaluated four times in a menstrual cycle during the MP (1-4 days), the FP (5-10 days), the MC (11-16 days) and the LP (17-28 days). Investigations were carried out in the morning hours of the day as far as possible inorder to avoid diurnal variations. Apart from the respiratory functions, haematological parameters viz. bleeding time, clotting time, prothrombin time and blood cell counts - both RBC count and WBC count and biochemical parameters viz. serum lipids, proteins, haemoglobin, and bicarbonate were examined in the different phases of the menstrual cycle. In addition to this, hormones viz. estrogen, progesterone, LH and FSH were also analyzed during the four phases of the menstrual cycle.
In the respiratory function, significant changes were observed mainly in the timed vital capacities viz. \( FEV_{0.5} \), \( FEV_1 \) and volumes viz., VC and FVC in different phases of menstrual cycle. Out of the flow rates expiratory flow rates seemed to change more than the inspiratory flow rates in different phases of the menstrual cycle. In an overall assessment, changes in respiratory functions were more significant towards the MC and LP than the earlier phases. The present study shows the augmentary role of progestrone in the ventilation especially in the LP of the menstrual cycle. The biochemical and hematological factors were not well correlated with the respiratory functions except in the case of few lung volumes and flow rates. The biochemical factors of the present study shows that the concentration of most of the lipoprotein cholesterol changed during different phases of menstrual cycle. A positive correlation of HDL-C with estrogen was observed while a negative correlation was observed between estrogen and total serum cholesterol. Tryglycerides did not seem to be affected by the phases of the menstrual cycle. Another factor observed was the positive correlation of fibrinogen with progesterone, which was significant in the LP.

It is clear from the above observations that while evaluating pre-menopausal women for plasma lipid and plasma clotting factor abnormalities, menstrual cycle phases and days should be taken into account with regard to the lipid profiles and hematological parameters. Since estrogen affects both serum HDL-C and LDL-C in beneficial ways and acts as a natural protective mechanism against cardiovascular diseases in pre-menopausal women, it is recommended that more effective researches can be done in the field of hormone replacement therapy (HRT) which lower the incidence of coronary artery diseases in post menopausal women.