

# TOTAL SERUM LIPIDS AND CHOLESTEROL DURING MENSTRUAL CYCLE OF TEENAGE GIRLS

by

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## Introduction

Female sex hormones play a significant role on lipid metabolism. Serum levels of circulating oestrogen and progesterone fluctuate considerably during the menstrual cycle, which might be responsible for varying levels of serum cholesterol and lipids. The present study aims to evaluate the fluctuation of the serum lipids and cholesterol at various levels of circulating oestrogen and progesterone during various phases of menstrual cycle in teenage girls.

## Material and Methods

Seventy-five healthy, unmarried female volunteers of 16-19 years of age were accepted for the present study. All of them had regular menstrual cycles of 28-30 days with an average flow of 2-3 days. Cycles were normal and painless. These teenage girls were not taking any hormonal preparations. The young females were clinically examined for hormonal assessment of the body. Bimannual

examination was not done. In each volunteer serum level of cholesterol and total lipids were studied on the following three phases of menstrual cycle:

(a) during menstruation, when oestrogen and progesterone levels were low.

(b) at the time of ovulation when oestrogen level was at peak and

(c) 8-9 days after second estimation when both these hormones are elevated in the blood.

Serum cholesterol and total lipids were estimated by the method given by Lef-fers (1961) and Gradwohi (1956) respectively.

Statistical significance was calculated by students unpaired 't' test.

## Observations

The serum total lipids and cholesterol levels observed in present study in various phases of menstrual cycle have been tabulated in Table I.

## Result Discussion

In the present study it was observed that serum cholesterol and total lipids were at the highest level during menstruation and then the levels gradually declined and were lowest in secretory phase of menstrual cycle (Table I).

The fall in serum levels of both cholesterol and total lipids was statistically

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TABLE I  
Serum Cholesterol and Total Lipids During Various Phases of Menstrual Cycle

Serum levels	Phases of menstrual cycle		
	Menstruation	Ovulation	Secretory
<b>Cholesterol (mg.%)</b>			
Mean $\pm$ S.E.	167.12 $\pm$ 3.67	165.55 $\pm$ 7.62	158.22 $\pm$ 2.50
Range	130.2 — 193.4	140.8 — 209.6	135.5 — 180.8
'p' Value	—	—	Significant
<b>Total Lipids (mg.%)</b>			
Mean $\pm$ S.E.	464.92 $\pm$ 9.84	454.47 $\pm$ 7.12	448.92 $\pm$ 7.51
Range	400-612	396-516	392-512
'p' Value	—	—	Significant

significant in the secretory phase in comparison to the levels at the time of menstruation.

The present study corroborates the findings of Lowbeer *et al* (1977) and Furaman *et al* (1958), while Ganong (1967) observed no change in the levels of serum cholesterol during various phases of the menstrual cycle.

These results can be correlated by the fact that serum sex hormone levels fluctuate considerably during various phases of the cycle. Serum cholesterol and total lipids were highest when the significant level of sex hormones were lowest as during menstruation, but declined during the secretory phase, when the level of these hormones were supposed to be at peak.

Davidoff (1973) and Gwen *et al* (1970) have observed such a fall in women consuming oral contraceptive pills, containing oestrogen and progesterone both, but

not in those receiving progesterone only. The rise in serum level was greater in those who were on higher dose combined pills. In the present study also, it was observed that in normal teenage girls having oestrogen levels at peak as at the time of ovulation, the levels are not to the lower limit but the levels decline later in secretory phase.

In confirmation of the findings of Davidoff (1973) and Gwen *et al* (1970) in the present study it was observed that only oestrogen is not responsible for declining the levels of serum cholesterol and total lipids, but with association of progesterone, there occurs a significant fall in serum levels of cholesterol and total lipids as in the secretory phase of menstrual cycle.

#### Summary

Oestrogen is supposed to be a factor in reducing serum cholesterol level and thus lesser incidence of coronary artery disease

in the females of reproductive age. In the present study, 75 females in their early reproductive life (teenage) were selected, and serum cholesterol and total lipids were analysed in various phases of menstrual cycle and it was observed that only oestrogen can not reduce the serum levels of cholesterol and total lipids but oestrogen in combination with the higher levels of progesterone can only lower the levels.

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