# A STUDY OF BLOOD CHOLESTEROL DURING PREGNANCY AND PUERPERIUM

by

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In earlier part of 18th century, Virchow showed that milky appearance of blood serum of pregnant women was due to presence of fat. Since then hyperlipemia remained a constant feature of pregnancy with return to normal during puerperium. Uptil now the underlying mechanism of this change is uncertain.

In order to investigate the alteration of cholesterol level during different trimesters of pregnancy, early puerperium, their correlation and to evaluate the probable role of placenta in it, present study was undertaken.

*Material and Method*

The present study was conducted on 125 cases in the Department of Obstetric and Gynaecology, Sardar Patel Medical College, Bikaner. It included 25 normal non-pregnant as control, 75 cases of normal pregnancy (25 cases in each trimester) and 25 cases of full term pregnancies, 24 hours before the parturition. These 25 cases were also included during early puerperium. Cord blood of 25 babies was taken after deliveries. In all cases, there was no evidence of hormonal deficiency before conception.

Detailed history of each case was taken in relation of age, partity, diet and socio-economic status.

5 ml of blood was collected in an oxylated vial from maternal antecubital vein of each case; 5 ml of mixed cord blood was taken in 25 newborns.

The blood was centrifused at approximately 3000 r.p.m. for 10 minutes to separate plasma and used for estimation of cholesterol by Kim and Goldberg's method (1969).

*Results and Conclusion*

In the present study, the mean average values of cholesterol in normal non-pregnant varied between 127 to 220 mg% with mean 170 ± 28.75 mg% (Table I. Our findings are in consonance with Mathur *et al* (1962), Chaturvedi *et al* (1978). High cholesterol levels were observed by Gupta *et al* (1967) can be explained by high fat diet, genetic factors and higher body weight in subject studied by them. On other hand, low cholesterol level was observed by Potnis and Purandare (1972). The difference in mean values of cholesterole may be attributed to socio-economic status and method of estimation.

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TABLE I

*Showing the Mean, S.D., S.E. and Range of Cholesterol in Various Groups Mean Weight of Mother, Babies and Placenta*

| Groups | No. of estimation | Mean | S.D. | S.E. | Range | M.B.W. of mother |
|---|---|---|---|---|---|---|
| Non-pregnant | 25 | 170 | 28.75 | 5.75 | 127-220 | 51.8 |
| Pregnancy: | | | | | | |
| I trimester | 25 | 183 | 23.17 | 4.63 | 150-230 | 52.64 |
| II trimester | 25 | 208 | 21.90 | 4.38 | 164-240 | 54.4 |
| III trimester | 25 | 256 | 18.51 | 3.90 | 190-276 | 56.0 |
| Ante-partum | 25 | 274 | 23.16 | 3.20 | 230-292 | |
| Puerperium | 25 | 236 | 17.43 | 3.48 | 210-264 | |
| Cord blood | 25 | 93 | 8.30 | 1.66 | 80-116 | |
| Mean weight of baby | 25 | 3.2 Kg | | | | |
| Mean weight of placenta | 25 | 544.8 gm | | | | |

After conception, plasma cholesterol mean average value increased progressively until term. The mean average value of first trimester was between 150-230 mg% with mean 183 ± 23.17 mg% which was higher than non-pregnant level, but statistically not significant. In second trimester, level varied between 150-230 mg% with mean of 208 ± 21.90 mg%. Although there was increase in level of comparison to first trimester and non-pregnant state, but was statistically not significant.

Increase in cholesterol level was also observed by Mullick (1964), Gupta *et al* (1967), Potter and Nestel (1979) during first and second trimesters of pregnancy.

The level of cholesterol in third trimester varied between 190 — 276 mg% with mean 256 ± 19.5 mg% ($p > .001$) which was highly significant.

This progressive increase in cholesterol level in the present series is in agreement with Smith *et al* (1959), Mullick *et al* (1964), Potnis *et al* (1972) and Chaturvedi *et al* (1978).

The level of cholesterol in antepartum, puerperium and cord blood varied between 230-292, 210-264 and 80-116 mg% with mean average value of 274 ± 16, 236 ± 17.43 and 93 ± 8.30 mg% respectively. The rise in antepartum was 61% when compared to non-pregnant levels. The increase in levels from third trimester to term was highly significant (p .001) which is in consonance with Smith *et al* (1959).

The decline in puerperium from antepartum was also significant, cholesterol level did not come to basal level in puerperium. Same was observed by Mendenz *et al* (1959), Potnis *et al* (1972), but present findings are in contrast to Smith *et al* (1959) who observed high level in postpartum cases.

In the present study, mean level of cord blood cholesterol was much lower than respective maternal values. Kleeberg *et al* (1963) found the ratio of 1 : 3.7 which in agreement of present study (1 : 2.95).

Mean body weight in normal non-pregnant, first, second and third trimesters and at term was 51.8, 52.8, 54.4, 55.24 and 56

Kg, showing a gradual increase until term. Body weight difference between first trimester to term compared to mean body weight of newborn, irrespective of sex i.e. 3.2 kg.

Mean placental weight was 544.8 gm. The new born and placental weight ratio was 5.87. Sen and Agarwal (1975) reported a ratio of 6.64. This is in close relation to the present study.

It can be concluded from above findings that serum cholesterol level starts rising from non-pregnant level and there was progressive and significant increase in the third trimester and ante-partum group and significant fall during the post-partum period. It can be stated that increase in cholesterol level after second trimester to term and fall in post-partum period where there was no placenta, proves that placenta plays a significant role in hypercholestrenia of pregnancy.

*Summary*

1. Blood cholesterol level was estimated in 125 cases at Associated Group of Hospitals, Bikaner.

2. There was progressive rise in blood cholesterol level from non-pregnant to term and decline in post-partum period.

3. Probably placenta is responsible for hypercholestrinia of pregnancy.

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