

EFFECT OF OOPHORECTOMY ON SERUM TRIGLYCERIDE LEVELS

by

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Coronary disease is a major cause of death. A well recognised fact about this disease is its lower incidence in young women compared to that in young men. The sex advantage declines with age and finally disappears after the menopause. A possible explanation for this lies in the different endocrine make up of men and women and a notion has gained wide currency that functioning ovaries provide protection against coronary artery disease. Hence the fate of a woman after oophorectomy with regard to incidence of coronary artery disease and change in serum lipids is to be seriously considered.

Material and Methods

The present study was carried out on 95 patients from Gynaecology Department of the Lady Hardinge Medical College and Shrimati Sucheta Kripalani Hospital, New Delhi.

Out of these, 55 patients had bilateral oophorectomy (Group I) and 40 patients who were not oophorectomised were used as controls (Group II).

Group I was further subdivided into a retrospective group (Ia) comprising of 35 patients who had bilateral oophorec-

tomy done at this hospital between 1968-1978 and a prospective group (Ib) having 20 patients who had bilateral oophorectomy between May 1978 and August, 1978. For the patients of group Ib investigations were done preoperatively and postoperatively at one week, one month, 3 months and 6 months.

History with reference to date and age at operation and climacteric symptoms was taken. A physical and pelvic examination was done. 5 ml. of blood was drawn in the morning after 12-14 hours fast. The serum was used for determining serum triglycerides by the method of Van Handel and Zilversmit (1957).

The data were tabulated after calculating means and standard deviations. The statistical significance of difference between means was determined by student's 't' test.

Observations: Non-oophorectomised Cases

The mean serum triglyceride level for all non-oophorectomised cases was found to be 122.7 mg% with a range of 47.0 to 182.0 mg%. It showed an increasing trend with age from a mean of 76.6 mg% in the age group 26-35 years to 166.8 mg% in the age group 56 and above. The rise was gradual between 26-35 and 36-45 years but steep after 36-45 years (statistically significant).

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TABLE I
Effects of Age and Menopause on Serum Triglyceride Levels of
Nonoophorectomised Cases

Age group	No. of cases	Menopausal Status	Mean Serum triglyceride level mg% \pm S.D.
26-35 years	5	—	76.60 \pm 11.44
36-45 years	10	—	101.11 \pm 12.58
46-55 years	20	—	133.90 \pm 13.13
	(Total)		
	10	Premenopausal	125.2 \pm 8.81
	10	Postmenopausal	142.6 \pm 10.77
56 and above	5	—	166.8 \pm 11.17
Total	40	—	122.65 \pm 29.11

Spontaneous menopause affected the serum triglycerides significantly. The mean serum triglycerides increased from premenopausal levels of 105.84 mg% to postmenopausal levels of 150.66 mg%—a statistically significant rise. Even after adjusting the age factor, serum triglycerides of postmenopausal women were significantly higher than those of premenopausal women (142.6 mg% and 125.2 mg%).

Oophorectomised Cases— Retrospective group

The mean serum triglyceride level of oophorectomised cases was 182.58 mg% with a range of 85.0 to 236.0 mg%. This level was significantly higher than non-oophorectomised cases (122.3 mg%).

The increase in serum triglycerides was more marked with surgical menopause (60.28 mg%) than with spontaneous menopause (17.4 mg%).

It was observed that the longer the interval since oophorectomy, the higher were the serum lipid levels. The triglycerides became significantly high within 12 months of oophorectomy, increasing from 122.3 mg% in non-oophorectomised to 159.22 mg% in those oophorectomised within 1 year. The levels continued to rise and became 163.75 mg% within 2 years, 197.21 mg% within 2 to 5 years and 200.0 mg% after more than 5 years of oophorectomy.

Age at Oophorectomy: The mean increase in triglycerides of 22.9 mg% was

TABLE II
Mean Serum Triglyceride Level in Oophorectomised Patients of Different Age Groups

Group	Age Range	No. of Patients	Mean Serum triglyceride mg% \pm S.D.
Oophorectomised	36-45	10	184.15 \pm 38.82
Controls	36-45	10	101.11 \pm 12.58
Oophorectomised	46-55	25	181.95 \pm 27.74
Controls	46-55	20	133.9 \pm 13.13
Oophorectomised	36-55	35	182.58 \pm 30.96
Controls	36-55	30	122.30 \pm 31.12

insignificant in the age group 51-55 years. The increase of 34.23 mg% for age group 46-50 was of borderline statistical significance and the mean increases of 69.11 mg% for 41-45, 93.37 mg% for 36-40 and 149.1 mg% for 31-35 age group were highly significant statistically.

In this study the menopause was found to be a significant atherogenic factor. Sznajderman and Olva (1963) and Feldman *et al* (1963) also reported higher triglyceride levels after menopause while Hagerup (1973) found no significant difference.

TABLE III
Relation Between Age at Oophorectomy and Serum Triglyceride Levels

Age Group	Mean Serum triglyceride of Oophorectomised patients mg% \pm S.D.	Mean Serum triglyceride of controls mg% \pm S.D.	Mean increase mg%
31-35	230.0	90.90	149.10
36-40	194.31 \pm 23.40	99.51 \pm 14.22	93.37
41-45	172.61 \pm 35.06	103.50 \pm 9.09	69.11
46-50	166.07 \pm 33.77	131.84 \pm 9.68	34.23
51-55	160.00 \pm 21.41	137.71 \pm 17.21	22.29

Prospective Group: The preoperative mean serum triglyceride level was 110.05 mg%. It was 126.35 mg% one week after operation and thereafter increased continuously to become 175.35 mg% 6 months after operation. The total mean increase in 6 months following operation was 65.3 mg%.

TABLE IV
Mean Serum Triglycerides at Different Intervals After Oophorectomy

Time interval after operation	Mean Serum triglycerides mg% \pm S.D.
Preoperative	110.05 \pm 24.55
One week	126.35 \pm 23.98
One month	150.10 \pm 30.45
Three months	156.80 \pm 31.68
Six months	175.35 \pm 27.84

Discussion

The serum triglycerides showed an increasing trend with age in the present study. Similar results have been given by Cramer (1962), Furman *et al* (1961) and Feldman *et al* (1963).

The present study revealed the mean serum triglycerides to be 122.3 mg% for non-oophorectomised and 182.58 mg% for oophorectomised cases. Wuest *et al* (1953) stated that occurrence of severe atherosclerosis was 10-45% greater in women oophorectomised 5-9 years earlier than age matched controls. Rivin and Dimitroff (1953) and Parrish *et al* (1967) also observed more coronary disease in oophorectomised women. Aitken *et al* (1971) and Johannasson *et al* (1975) reported a significant increase in triglycerides after oophorectomy. In contrast Novak and Williams (1960) and Ritterband *et al* (1963) do not agree to such an atherogenic effect of oophorectomy.

In the present study, the mean increase in triglycerides was more with surgical menopause than with spontaneous menopause and is in accordance with the clinical findings of Gordon *et al* (1978) and Kannel *et al* (1976).

The serum triglycerides reached significantly higher levels within one year of

oophorectomy and continued to increase later on in the present study. Wuest *et al* (1953) reported that it took at least 5 years after oophorectomy to have significant difference in the degree of atherosclerosis. Parrish *et al* (1967) supported and Weiss (1972) refuted such a relation with increase in interval after oophorectomy.

The increase in serum triglycerides was inversely proportional to the age at oophorectomy in this study. Parrish *et al* (1967), Aitken *et al* (1971) and Kannel *et al* (1976) found results in close association with this study. While Ask Upmark (1962) and Novak *et al* (1960) found no difference with difference in age at time of operation.

In the prospective study, the serum triglyceride level showed a clear tendency to rise after oophorectomy over the 6 months follow-up period. The levels were significantly higher at the end of one month and thereafter continued to rise. Punnonen and Lauri (1976) reported triglycerides to be significantly higher one month after castration but after that in their study the levels remained almost unchanged.

Summary and Conclusions

The mean serum triglyceride level for non-oophorectomised women was 122.7 mg% and it increased with age and after menopause. The oophorectomised women had significantly higher levels than age matched non-oophorectomised women and the difference was more marked in women oophorectomised before the age of 50 years.

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