SERUM LIPID STUDY IN CASES USING ORAL CONTRACEPTIVE

by

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From time to time contraceptive 'pill' has been blamed for producing alterations in the level of serum lipids. Serum lipid levels are higher in men than in women and are different in premenopausal women when compared with menopausal women. This difference is mainly attributed to the variation in the concentration of steroid hormones secreted by the gonads and steroid hormones are the basis of contraceptive pills. Raised serum lipid and liporotein levels are related to the increased incidence of occlusive vascular disease. Lipids are said to play an important role in atherogenesis due to accumulation of esterified cholesterol in fibrous plaques (Taylor and Kang-Jay, 1967). The effect of oral contraceptive on the lipid metabolism has been studied by many workers. Pincus (1965), for the first time studied plasma cholesterol level after taking oral contraceptive.

Material and Methods

Eighty women attending out patient department and Family Planning Clinic of U.I.S.E. Maternity Hospital, Kanpur were selected for this study. These women were in the age group of 20-40 years and were of proven fertility from para 1 to para 5. All the women in this study were normal, healthy and non-pregnant. Each woman had complete systemic and vaginal examination before starting oral pills. Routine laboratory investigations such as haemoglobin estimation, TLC, DLC and urine examination were done. Combined type (Ovral, Wyeth Laboratory) 'pill' was given to them which contains dl-norgestrel (Progestagen) 0.5 mg and ethinyloestradiol 0.05 mg. Venous blood sample for this study was collected from each subject after 12 hours of night fast and wtih normal diet for three days prior to collection of blood. To avoid the effect of posture on serum lipids the blood was collected after allowing the patient to remain in supine position for half an hour.

Estimation of total serum cholesterol was done by Zlatkis method (1953). estimation of serum triglyceride was done by micromethod of Van Hardel-Zilversmit and estimation of serum phospolipid was done by Connerty Briggs and Hatons (1961) method. Investigations were done once before administering oral contracep-

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Burst Abdomen in Obstetrics and Gynaecology—Goswami, et al. pp. 69-72

Fig. 1
Shows burst abdomen following LUCS with protrusion of small intestine.

Fig. 2
Shows interrupted nylon stitches passed through rubber collars and a rubber drain at right flank.

Undiagnosed Dicephalic Monster—Saraogi and Vaidya pp. 158-159

Fig. 1
Showing the dicephalic monster.

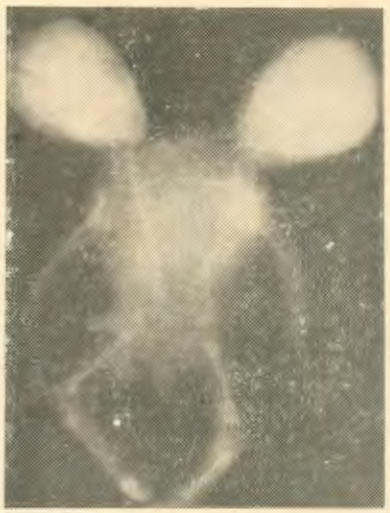

Fig. 2
X-ray photo of dicephalic monster.

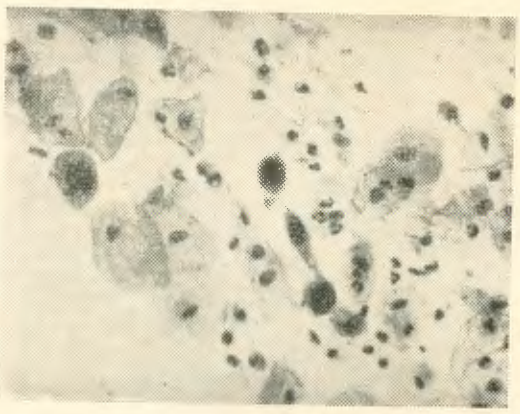

Fig. 1
Smear done 5 years after conisation showing persistence of severely dysplastic cells (Low power).

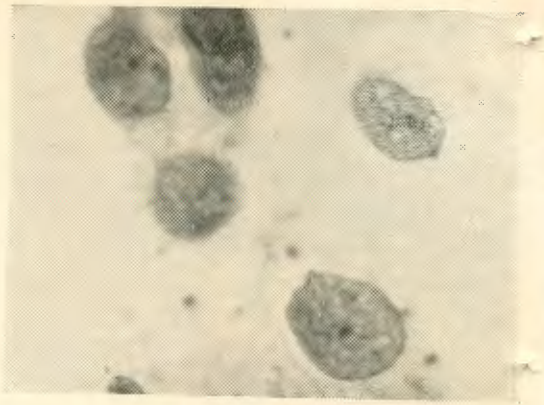

Fig. 2
Same as Fig. 1 under high power.

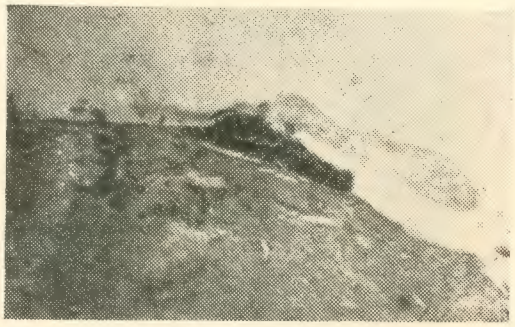

Fig. 3
Low power field of punch biopsy showing severe dysplasia with probable progression to Carcinoma in situ.

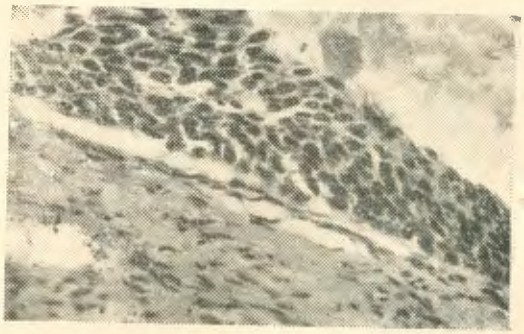

Fig. 4
Same as Fig. 3 under high power.

A PEDIGREE OF A FAMILY WITH REPRODUCTIVE FAILURE

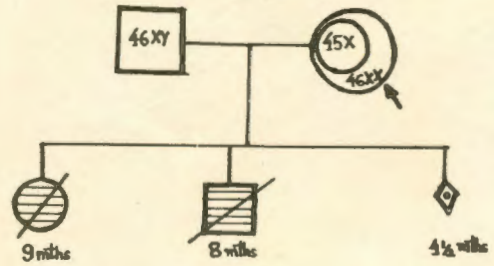

Fig. 1
Pedigree of a female with reproductive failure.

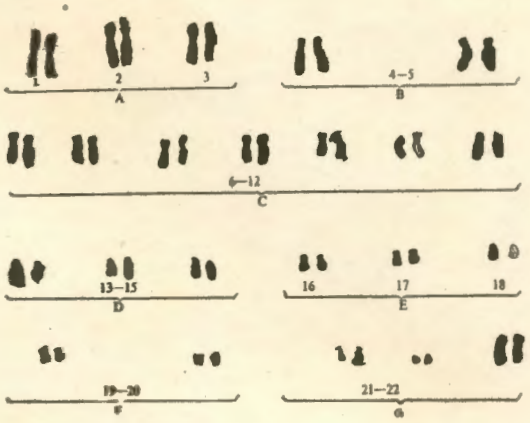

Fig. 2
Karyotype of a female with 46 x line (70%)

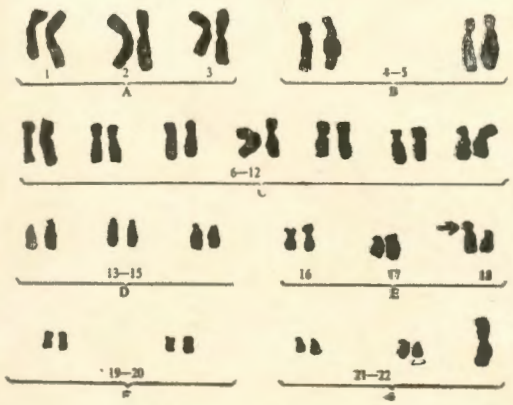

Fig. 3
Karyotype of the same female with 45 x cell line (30%).

Secondary Post-partum Haemorrhage—Jameela and Khanum pp. 155-157

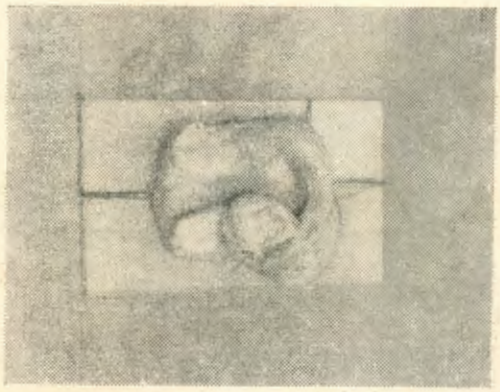

Fig. 1
Cut section through uterus showing fibroid with cavity (marked by arrow).

Pyonephrosis Simulating Ovarian Cyst—Murty and Mehra pp. 162-163

Fig. 1
Showing the entire specimen of right sided kidney with pyonephrosis.

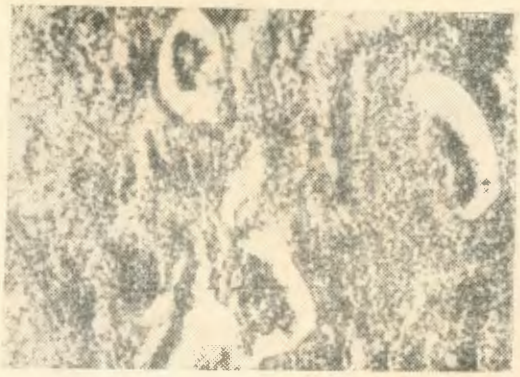

Fig. 2
Showing the round cell infiltration of the glomeruli and tubulus.

Acute Abdomen in First Trimester of Pregnancy —Kolatkar et al pp. 160-161

Fig. 1
'Hydrosalpinx' that complicated pregnancy.

Peritoneal Malignant Mesothelioma— Kasturi Lal et al. pp. 177-178

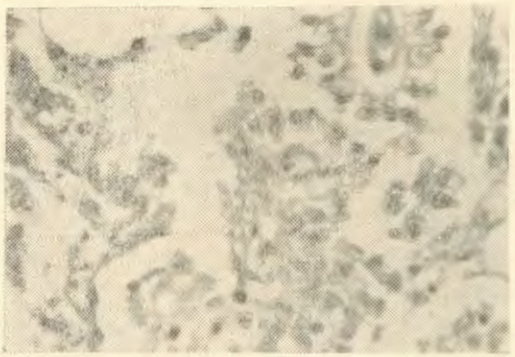

Fig. 1
Microphotograph showing malignant mesothelioma.

Fig. 1
X-ray showing I.U.D. in transverse position.

Fig. 2
X-ray showing I.U.D. lying near right pelvic wall.

Endometriosis on Abdominal Scar—
Misra and Nanda pp. 171-172

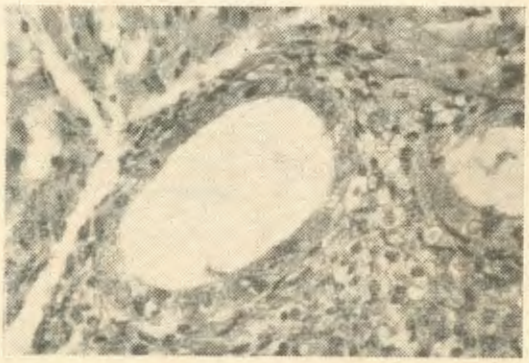

Fig. 1
Photomicrograph of section from case No. 1 showing dilated endometrial gland lined by low cuboidal epithelium and surrounded by scanty endometrial stroma. Dense fibrocollagenous tissue is seen in left upper corner (HE stain x 400).

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15th February 1981

Dr. G. N. Vazifdar
Secretary & Manager.

tive and then after 1 month, 3 months, 6 months and 9 months after their use.

Results

Each case served as its on control. The values of serum cholesterol, triglyceride and phospholipid after the use of oral pills were compared with the values of same before administering the pill. The following Table I, II and III show the alterations in the level of serum cholesterol, tryglyceride and phospholipid in relation to duration of using oral contraceptive.

The values of serum cholesterol showed a rise after 1, 3, 6 and 9 months of using oral contraceptive. Rise after 1 and 3 months was statistically insignificant ($P > .05$), whereas the rise after 6 and 9 months was statistically significant ($P < .05$).

The increase in serum triglyceride level as compared to the mean value before the use of oral contraceptive was statistically insignificant ($P > .05$) after 1, 3 and 6 months and significant ($P < .05$) after 9 months of use of oral contraceptive.

The rise in serum phospholipid levels after 1, 3 and 6 months of use was statistically insignificant ($P > .05$). However the rise after 9 months of using oral contraceptive was statistically significant ($P < .05$).

TABLE I

Changes in Serum Cholesterol Level in Relation to Duration of Using Oral Contraceptive

Statistical parameter	Before using oral contraceptive in mg.%	1 month after oral contraceptive in mg.%	3 months after O.C. in mg.%	6 months after O.C. in mg.%	9 months after O.C. in mg.%
Range	150-250	155-252	155-252	155-250	150-255
Mean	198.35	203.70	205.75	209.35	211.70
S.D.	33.51	32.95	33.48	30.95	30.80
		P>.05 Insignificant	P>.05 Insignificant	P<.05 Significant	P<.05 Significant

TABLE II

Changes in Serum Triglyceride Level in Relation to Duration of Using Oral Contraceptive

Statistical parameter	Before using oral contraceptive in mg.%	1 month after using O.C. in mg.%	3 months after using O.C. in mg.%	6 months after using O.C. in mg.%	9 months after using O.C. in mg.%
Range	102-136	104-134	103-136	108-135	106-136
Mean	118.45	119.25	119.20	119.25	122.20
S.D.	9.83	9.10	10.55	9.10	9.88
		P>.05 Insignificant	P>.05 Insignificant	P.>.05 Insignificant	P<.05 Significant

TABLE III

Changes in Serum Phospholipid Level in Relation to Duration of Using Oral Contraceptive

Statistical parameter	Before using oral contraceptive in mg.%	1 month after using O.C. in mg.%	3 months after using O.C. in mg.%	6 months after using O.C. in mg.%	9 months after using O.C. in mg.%
Range	170-275	175-276	172-287	172-286	176-285
Mean	232.25	234.25	236.25	239.30	243.95
S.D.	32.45	31.72	33.14	33.12	32.32
		P>.05 Insignificant	P>.05 Insignificant	P>.05 Insignificant	P<.05 Significant

Discussion

One of the most obvious features of atheromatous leison is the presence of lipids and more particularly cholesterol (Boyd 1958). It is therefore of paramount interest to assess the role of oral contraceptive pills in altering the concentration of blood cholesterol, triglycerides and phospholipids. The hyperlipemia observed in our study is in aggreement with the results reported by Devi and Sharma (1972) and Gupta and Sharma (1976). We found statistically significant increase in mean serum cholesterol level after 6 and 9 months of using oral contraceptive. Aurell *et al*)1966) and Jhonson and Lee (1973) also reported increase in serum cholesterol level after the use of oral contraceptive.

In our study mean serum triglyceride level increased significantly ($P < .05$) after 9 months of using pills. This is in aggreement with Ham and Rose (1969). Barton *et al* (1970) and Corredor *et al* (1970). Increase in serum triglyceride level reported by Aurell *et al* (1966) was much greater than what was observed in present series. They reported 70% increase in triglyceride levels. Stokes and Wynn (1971) observed that the most oestrogenic pills gave the highest triglyceride values and the most progestational preparations gave the highest cholesterol values.

We found statistically significant ($P < .05$) increase in serum phospholipid levels after 9 months of using oral pills. Aurell *et al* (1966) also reported sifinificant increase in serum triglyceride levels after the use of oral contraceptive Gupta and Sharma (1976) reported an insignificant rise in serum phospholipid level in women taking pills for more than 1 year to more than 3 years. De Alvarez *et al* (1973) reported that there was no change or a very slight change with the use of oral in serum phospholipid levels.

Although the mean levels of various lipid fractions of blood, in the present series remained below the upper limit of normal, the mean values of serum phospholipid and serum triglyceride after 9 months of use and that of serum cholesterol after 6 and 9 months of use were significantly higher as compared to the values before starting the pill. This suggests that the continued use of oral contraceptive pill does produce a mild but statistically significant rise in serum cholesterol, phospholipid and triglyceride levels. Albrink *et al* (1962) have postulated that this hyperlipaemia could be

related to weight gain due to the action of gonadal steroids. Wynn *et al* (1966) reported that oral contraceptives have a diabetogenic action, thus the lipaema due to these steroid hormones of the pill could be related to hyperlipaemia of diabetic state.

Triglyceride uptake in adipose tissue is directly proportional to its lipoprotein lipase content. It seems likely that subjects taking oral contraceptives have adminished tissue lipoprotein lipase activity and therefore a diminished capacity to clear circulating triglycerides. This may be one important factor contributing to the increase in plasma triglyceride reported in these subjects (Ham and Rose, 1969).

Summary

Eighty normal healthy women were selected for this study. They were advised to take contraceptive pill (Ovral) regularly throughout the period of study. Serum cholesterol, triglyceride and phospholipid levels were estimated after 1, 3, 6 and 9 months of using the pill. Significant increase was found in mean values of serum cholesterol after 6 and 9 months, serum triglyceride after 9 months and serum phospholipid after 9 months of taking oral contraceptive. The relationship of these changes to atherosclerosis has not yet been established but these changes can not be lightly dismissed as harmless.

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