



## LIPID PROFILE AND ORAL CONTRACEPTIVES IN PREMENOPAUSAL WOMEN OF INDIA

### Biochemistry

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### ABSTRACT

**Background:** Hormonal contraceptive had many side effects including disturbance of serum lipid profile among users, which may lead to serious consequences on young women's health. Objectives The study intended to examine the impact of using hormonal contraceptive on lipid profile of women at reproductive age.

**Methods:** This is a case control study conducted in Amritsar city in the period from March to August, 2019. It included sixty (60) healthy women, forty (40) of them using hormonal contraceptive and twenty (20) as control group.

**Results:** The mean of serum total cholesterol in the case group was 168.49mg/dl while it was 136.16mg/dl in the control group, with p .value 0.000, mean level of serum triglycerides in the case group was 120.13mg/dl compared to 106.89mg/dl in control group, with p .value 0.000. There was a significant increase in the serum LDL-c in the case group with a mean value of 88.78mg/dl, and 47.13mg/dl in control group, p .value 0.000. There is also a significant decrease of serum HDL-c in case group with the mean value of 35.93mg/dl, and 95.055mg/dl in the control group.

### KEYWORDS

Contraceptives, lipid profile, cholesterol

### INTRODUCTION

Contraceptives are devices or techniques that permit vaginal sexual practice with no risk of pregnancy. (1)Hormonal contraceptives are of special interest due to their various effects on lipid metabolism that may alter lipid profile (2) and hence increase the risk of premature atherosclerosis. (3) . Hormonal contraceptives are available in various dosage forms and different routes of administration: oral, intramuscular, transdermal, subdermal implants. (4) They have different mechanism of action depending on their type, such as inhibiting the secretion of follicle stimulating and luteinizing hormone and thicken the cervical mucus, (5) Today, millions of women are using oral contraceptives for various reasons. (6) The use of hormones in birth control began in 1937 when Makepeace, showed that ovulation could be prevented by injecting progesterone into rabbits. In 1959, oral contraceptives were approved in the United States. The use of oral contraceptives has empowered women with effective tools to control their bodies (7), but it is not an ideal method for contraception anyhow. The ideal one should be highly effective, with minimal side effects, cheap, independent of intercourse, rapidly reversible, widespread availability, acceptable to all cultures and religions, easily distributed, and can be administered by non-healthcare personnel. Some method of contraception can only be prescribed by a doctor, whereas other can be used without medical advice.(8) Combined oral contraceptives (COCs) cause slight increases in some procoagulant factor and reduce the levels of some natural anticoagulant anti thrombin .The effect is marked with third- generation pills (containing degestrol or gestodene) and with second- generation pills (containing levonorgestrel).(9) The most widely available COCs in the public sector contain the progestogens levonorgestrel (LNG) or norethisterone (NET) which is also known as norethindrone.(10)

The effectiveness of COCs can be reduced if they are taken in combination with other drugs that influence oestrogen/progestogen metabolism (e.g barbiturates, phenytoin, phenylbutazone, rifampicin, griseofulvin) or certain broad-spectrum antibiotics that affect the gastrointestinal flora (ampicillin and tetracyclines).(11) Combined oral contraception acts both centrally and peripherally. Inhibition of ovulation is by far the most important effect. Both oestrogen and progestogen suppress the release of pituitary follicle-stimulating hormone (FSH) and luteinizing hormone (LH), which prevents follicular development within the ovary and therefore ovulation. Peripheral effects include making the endometrium atrophic and hostile to an implanting the fertilized ovum and altering cervical mucus to prevent sperm ascending into the uterine cavity.(12) The progestogen-only pills (pop) are ideal for women at times of lower fertility. The POP is taken every day without a break. Particular indication for the POP includes: breastfeeding, older age, cardiovascular risk factors diabetes.(13)

### MATERIAL AND METHODS

A case control study conducted during the period between March to August 2019 in Amritsar. Forty women using contraceptives were enrolled in this study as test group (n=40) and apparently healthy women not using contraceptive as control group (n=20). Females who had disease diabetes, cardiovascular disease, hormonal disorders, hypertension, hyperlipidemia, alcohol and smoking habits are excluded from study sample. Cases were taken up from Post-partum unit of and were aged 30 to 40 years ,who had been using MALA-D, which contains D-Norgestrol 0.50mg and Ethinyl oestradiol, 0.04mg for the last 3 months . The subjects were age and gender matched .

Participant's who are well informed about the study and accepted to be volunteers are included.

After 12 hours of fasting, 5 ml of venous blood was collected in dry sterile syringe from each subject (patients and controls). The blood was kept at room temperature for one hour to clot, and was then centrifuged at 2000r.p.m for 5minutes to separate serum from the cells. Serum Sample were taken in plain vial and serum cholesterol, serum triglyceride and HDL were estimated by Semi-auto analyzer method. The result were collected and analyzed.

### STATISTICAL ANALYSIS

Statistical analysis was performed by the use of SPSS (Statistical Package for the Social Sciences) for windows version 16, with P. values < 0.05 were considered as statistically significant.

### RESULTS

The mean value of serum cholesterol in cases group and control group were 193.48± 14.49 mg% and 184.46± 13.58 mg% respectively with p value of 0.000 serum triglyceride is 120.13 ± 11.3 mg% and 106.89 ± 11.02 mg% respectively with p value of 0.000. Mean value of HDL in cases and control were 35.93 ± 5.11 mg% and 57.055 ± 11.04 mg% with p value of >0.05 (p=0.000). This shows that serum total cholesterol and serum triglyceride shows statically significant association while serum HDL shows no association.

**Table 1: Lipid profile in case and control group**

Parameters	Case Mean±SD	Control Mean±SD	P value
Serum Cholesterol	191.45± 14.09 mg%	180.42± 12.8 mg%	0.000
Serum Triglyceride	120.13 ± 11.3 mg%	106.89 ± 11.02 mg%	0.000
Serum HDL	35.93 ± 5.11 mg%	57.055 ± 11.04 mg%	0.000

## DISCUSSION

The aim of this research was to study the effect of hormonal contraceptives on lipid profile (Total cholesterol, triglycerides, high density lipoprotein- cholesterol, and low density lipoprotein-cholesterol) in women using contraceptives as test group and women who did not use it as control group. The overall results of this study consistent with results of the study carried by George A Asare and others in Ghanaian community in 2014, that revealed a significant increase in total cholesterol among women using hormonal contraceptives with the p.value 0.002. That study also demonstrated significant increase in triglycerides with the p. value 0.026 and significant increase in LDL-c with the p.value 0.004 compared to women who did not use it (14).

The results of this study were in consistent with some of the results from study in urban city Port Harcourt in Rivers State, Nigeria in 2011, that reported significant change in serum triglycerides with p. value <0.05 and LDL-c in women on oral contraceptives, and significant change with p.value <0.05 in HDL-c and LDL-c in women on injectable contraceptives (15).

## CONCLUSION

On the basis of this study, we could conclude that by using hormonal contraceptives, levels of total Cholesterol, triglycerides and low density lipoprotein will increase. While the HDL-c level decreased. The effect was more obvious in the older age group (20-39) years and multiparity >5 and with the used combined oral pills. Therefore reasonable caution should be exerted by the health professional before prescribing hormonal contraceptives for women at reproductive age.

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