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Assessment of impact of Oral Contraceptives on Lipid Profile in Premenopausal Women

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ABSTRACT

Background: World is facing the most serious problem that is population explosion. Contraception method is used worldwide for over birth control or unwanted pregnancies. Hence; the present study was undertaken for assessing the impact of oral contraceptives on lipid profile in Premenopausal Women.

Materials & methods: A total of 30 pre-menopausal subjects were enrolled. All the subjects belonged to the age group of 30 to 40 years. Only those subjects were included in the study group which has been using oral contraceptives for the last 3 months. Another set of 30 subjects with negative history of intake of oral contraceptives were taken as controls. Complete demographic and clinico details of all the patients were obtained. Blood samples of all the patients were obtained and were sent for analysis of lipid profile. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

Results: Mean serum cholesterol levels among the patients of the study group and the control group was 196.5 mg% and 181.4 mg% respectively. Mean serum triglyceride levels among the patients of the study group and the control group was 95.4 mg% and 82.6 mg% respectively. Mean serum high density lipoproteins levels among the patients of the study group and the control group was 41.6 mg% and 42.8 mg% respectively. Mean serum cholesterol levels and serum triglyceride levels among the patients the study group was significantly higher in comparison to the patients of the control group.

Conclusion: Use of oral contraceptives significantly alters the lipid profile in premenopausal women.

Key words: Oral contraceptives, Lipid

INTRODUCTION

World is facing the most serious problem that is population explosion. Contraception method is used worldwide for over birth control or unwanted pregnancies. Many workers have suggested that the use of contraceptives is beneficial but also have some side effects too. The researchers believe that the widespread use of hormonal contraceptive provides an opportunity for assessing the influence of estrogens and progesterone on various biochemical parameters among users. Synthetic progestins not only have genotoxic potential but are also vulnerable to various types of cancer. It was found that the bone formation was significantly decreased in women taking oral contraceptive pills. Some remarkable findings are well documented by workers which showed that oral contraceptives are involved in many diseases such as, myocardiac infraction and carcinogenicity.[1- 3]

There is no doubt as to the superior efficacy of progestogens or combined pill, over that of previous methods of fertility control, their wide spread use has raised the question of long term safety in addition to the short term side effects like nausea, vomiting, break- through bleeding, weight gain etc,. They after the endocrinal hemostatic mechanism of body and may affect various metabolic processes. One such field is their effects on plasma lipids.[4- 6] Hence; the present study was undertaken for assessing the impact of oral contraceptives on lipid profile in Premenopausal Women.

MATERIALS & METHODS

The present study was undertaken for assessing the impact of oral contraceptives on lipid profile in Premenopausal Women. A total of 30 pre-menopausal subjects were enrolled. All the subjects belonged to the age group of 30 to 40 years. Only those subjects were included in the study group which has been using oral contraceptives for the last 3 months. Another set of 30 subjects with negative history of intake of oral contraceptives were taken as controls. Complete demographic and clinico details of all the patients were obtained. Blood samples of all the patients were obtained and were sent for analysis of lipid profile. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Mann Whitney U test was sued for evaluation of level of significance.

RESULTS

Mean age of the patients of the study group and the control group was 37.8 years and 36.1 years respectively. 10 patients of the study group and 11 patients of the control group belonged to the age group of 34 to 37 years. 14 patients of the study group and 18 patients of the control group were of rural residence while the remaining was of urban residence. Mean serum cholesterol levels among the patients of the study group and the control group was 196.5 mg% and 181.4 mg% respectively. Mean serum triglyceride levels among the patients of the study group and the control group was 95.4 mg% and 82.6 mg% respectively. Mean serum high density lipoproteins levels among the patients of the study group and the control group was 41.6 mg% and 42.8 mg% respectively. Mean serum cholesterol levels and serum

triglyceride levels among the patients the study group was significantly higher in comparison to the patients of the control group.

Table 1: Demographic data

Parameter		Study group (n)	Control group (n)
Age group	30 to 33	8	10
	34 to 37	10	11
	38 to 40	12	9
Residence	Rural	14	18
	Urban	16	12

Table 2: Comparison of lipid profile

Lipid profile	Study group	Control group	p- value
Serum cholesterol (mg%)	196.5	181.4	0.001 (Significant)
Serum triglycerides (mg%)	95.4	82.6	0.018 (Significant)
Serum high density lipoproteins (mg%)	41.6	42.8	0.118 (Non-significant)

DISCUSSION

Within the past decade, elevated serum levels of total cholesterol (TC), triglyceride (TG), and low-density lipoprotein cholesterol (LDL-C) have been associated with an increased risk of cardiovascular disease. Under physiological conditions, endothelial cells are responsible for the maintenance of vascular integrity. Thus, these cells prevent the activation and aggregation of inflammatory cells and platelets, promote fibrinolysis and control vascular tonus. These antiatherogenic properties of the endothelial cells are controlled by the enzyme nitric oxide synthase (eNOS), which is responsible for the synthesis and release of nitric oxide (NO). The release of this molecule inhibits the expression of inflammatory cytokines and adhesion molecules (ICAM and VCAM), prevents the activation of platelets and promotes vasodilation. Nevertheless, the continuous exposure of the endothelium to risk factors such as smoking, hypertension, obesity, inflammation, insulin resistance and hyperlipidemia, may lead to endothelial dysfunction, which contributes to the formation of atherosclerotic plaque and cardiovascular diseases.[7- 9] Hence; the present study was undertaken for assessing the impact of oral contraceptives on lipid profile in Premenopausal Women.

In the present study, mean age of the patients of the study group and the control group was 37.8 years and 36.1 years respectively. 10 patients of the study group and 11 patients of the control group belonged to the age group of 34 to 37 years. 14 patients of the study group and 18 patients of the control group were of rural residence while the remaining was of urban residence. Mean serum cholesterol levels among the patients of the study group and the control group was 196.5 mg% and 181.4 mg% respectively. Mean serum triglyceride levels among the patients of the study group and the control group was 95.4 mg% and 82.6 mg% respectively. Asare GA et al determined the lipid profile pattern and CV risk. Forty-seven and 19 cases were on oral contraceptives (OCs) and injectable contraceptives (ICs), respectively;

five were on subdermal implant. Twenty-four non-users served as controls. Biodemographic and lipid profiles were determined. Total cholesterol (TC), high-density lipoprotein cholesterol (HDLC), low-density lipoprotein cholesterol (LDLC), and very-low-density lipid lipoprotein cholesterol (VLDLC), were determined. Castelli index I and II were calculated. Spearman's rho correlation showed significant influence of HC use on TG (P=0.026), TC (P=0.000), LDLC (P=0.004), and VLDLC (P=0.026) over time. Hormonal contraceptives use is associated with significant increases in BMI, diastolic BP, TC, LDLC, and Castelli index I and II. These changes carry a potential risk in the development of CV disease.[10]

In the present study, mean serum high density lipoproteins levels among the patients of the study group and the control group was 41.6 mg% and 42.8 mg% respectively. Mean serum cholesterol levels and serum triglyceride levels among the patients the study group was significantly higher in comparison to the patients of the control group. Vaziri SM et al evaluated the impact of exogenous female hormone usage on the lipid profile among premenopausal and postmenopausal women. One thousand nine hundred thirty female participants of the Framingham Offspring study comprised the study population. Of the 992 premenopausal subjects, 57 were current oral contraceptive users; among the 938 postmenopausal subjects, 80 were current hormone users. Increased estrogen content was inversely associated with low-density lipoprotein cholesterol, and apolipoprotein B levels, while increased progestin content was inversely related to high-density lipoprotein cholesterol and apolipoprotein A-I levels. Among postmenopausal women, use of premarin only was significantly associated with increased high-density lipoprotein cholesterol and apolipoprotein A-I levels. Combination use of premarin and provera was significantly associated with increased apolipoprotein A-I levels; less powerful but still significant associations with increased high-density lipoprotein cholesterol and decreased low-density lipoprotein cholesterol were also observed. In their cross-sectional analysis, oral contraceptive use was associated with both favorable and unfavorable lipid alterations with respect to atherogenic risk.[11]

CONCLUSION

From the above results, the authors conclude that use of oral contraceptives significantly alters the lipid profile in premenopausal women.

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