Short communication

Study on the Effect of Prolonged Use of Oral Contraceptives on Serum Lipid Profile in Healthy Young Women

Md. Shidul Arefin[1*], M. A Razzaque Mia[2], M. Suhrab Ali[3], Rahima Arzoo[4] and M. Rukunuzzaman[5]

[1]Institute of Nutrition and Food Science, University of Dhaka; [2]Department of Biochemistry, Mymensingh Medical College; [3]Public Service Commission, People's Republic of Bangladesh; [4]Technical Teachers Training College, Tejgaon, Dhaka; [5]Department of Pediatrics, Mymensingh Medical College & Hospital, Mymensingh, Bangladesh.

Abstract

A study was undertaken to determine the effect of prolonged use of oral contraceptives (OCs) on serum lipid profile in healthy young women. Sixty subjects were selected. Out of them, thirty served as control and the rest were as experimental subject. The age range of the volunteers was 20 to 35 years and the duration of pill use was 3 to 5 years uninterruptedly. The mean (±SE) total cholesterol (TC) level of the control and experimental groups were 153 (±3.87) and 169 (±4.13) respectively and the mean (±SE) triglyceride (TG) levels were 76 (±5.13) and 141 (± 8.85) respectively. Levels of total cholesterol and triglyceride were significantly higher in contraceptive user than those in the control. LDL-cholesterol level was also significantly higher in OC user compared to non-user control subjects. It was concluded that OCs elevated both serum cholesterol and triglyceride levels and are not beneficial for health.

Key Words : Oral Contraceptives, Serum Lipids, Young Women

Introduction

About sixty million women world-wide including a large number from Bangladeshi women use OCs contraceptive agents. Various side effects have been reported by different group of investigators and still continuing to be demonstrated whenever questions regarding the safety of these agents arise. It

Bangladesh Journal of Nutrition, Vol. 13, December 2000. Institute of Nutrition and Food Science, University of Dhaka, Dhaka-1000, Bangladesh.

* *Author for Correspondence*

is suggested that there is a definite relationship between the use of OC steroids and side effects like hyperlipidemia, coagulation defects and cardiovascular disorders predisposing thrombembolism, hypertension, oedema and migraine[1].

Though it has not yet been possible to find out the exact mechanism of these side effects, most of the research workers agree that the side effects, including occlusive vascular diseases are due to altered lipid profile from the use of these agents[2-5]. So the present work has been designed to study the prolonged use of OCs on serum lipid levels in young women.

Materials and Methods

Sixty young women aged 20-35 years belonging to same socioeconomic class were selected for the present study. Of them thirty served as control (group 1) who were using Copper T, barrier methods and physiological safe period; and the rest thirty were taken as experimental subjects (group 2) taking contraceptive pills for more than 3 years uninterruptedly.

The subjects were selected from Maternity and Child Health Training Centre, Azimpur, Dhaka and Model Family Planning Centre, Mymensingh Medical College Hospital, Mymensingh.

The study was carried out in the department of Biochemistry, BSMMU, Shahbagh, Dhaka. Due permission was taken from the concerned authority. The subjects were explained about the purpose of the study and written consent was obtained. Each individual completed a questionnaire on their occupation, smoking habit, recent or chronic illness and family history of hypertension. Subjects with obesity, diabetes mellitus, chronic heart disease (CHD) and previous history of hypertension were excluded from the study. All subjects were nonsmoker and nonalcoholic.

After selection, the individual was requested to attend the concerned centre at 8 a.m. on a particular date after overnight fasting 5ml of venous blood was collected and serum total cholesterol (TC), triglyceride (TG), high-density lipoprotein cholesterol (HDL-chol) were determined by using human Kits, low density lipoprotein cholesterol (LDL-chol) was determined by using Friedwald's formula.

Results

The results obtained are presented in table 1. Statistical significant of difference was evaluated by using unpaired students 't' test.

The mean serum total cholesterol of control (group 1) and that of experimental group (group 2) were 153 ± 3.87 mg/dl and 169 ± 4.13 mg/dl respectively. There was a significant ($P < 0.01$) increase in serum total cholesterol in subjects taking OCs. Mean serum triacylglycerol were 76 ± 5.15 to 141 ± 8.85 in control group respectively. The serum triacylglycerol level was also significantly higher in the experimental group ($p < 0.001$).

Table 1. Mean serum lipid profile in the two groups under study

Parameters	Group 1 (mg/dl)	Group 2 (mg/dl)
Total cholesterol	153 ± 3.87	169 ± 4.13**
Total Triglyceride	76 ± 5.15	141 ± 8.85***
LDL-chol.	98 ± 3.11	105 ± 4.01*
HDL-chol.	37 ± 1.75	35 ± 0.88

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$
Group 1 = Control group; Group 2 = Experimental group

LDL-cholesterol levels were 98 ± 3.11 and 1.5 ± 4.01 in control and experimental group respectively which showed increased LDL-cholesterol level in the experimental group.

The serum HDL-cholesterol was slightly decreased in the experimental group, but statistically not significant.

Discussion

In the present study mean serum total cholesterol and triacylglycerol were significantly higher in experimental group in comparison to that of the control group. Similar changes were observed by group of workers with experimental subjects by prolonged use of oral contraception pills[6,7]. The possilbe mechanism of raised cholesterol level was not exactly known but most of the workers are on the opinion that it was due to impaired excretion from liver resulting from cholestasis. The elevation of serum triacylglycerol level in the experimental subjects was more pronounced than that of cholesterol level. It

was thought that the rise in triacylglycerol level was due to its increased endogenous synthesis by liver as well as by impaired removal. Raised serum LDL-cholesterol in experimental subjects coincide with the findings of some observer[4,5]. Possible mechanism of raised LDL-cholesterol was due to increased LDL-cholesterol synthesis by the liver. Serum HDL-cholesterol was decreased in experimental group compared with control group. But the result was not significant. Thus, it is concluded that prolonged use of oral contraceptive pill is harmful for young women being in relation to cardiovascular diseases.

References

1. De Alvarez RR, Jahed FM, Spitalny KJ, Klkin H and Jaunakais I. The influence of oral contraceptive steroids on serum lipids, Am. J. Obstet. Gynecol. 1973; 116 : 727-49.
2. Keys A and Findanza F. Serum cholesterol and relative body weight of coronary patients in different populations. Circulation. 1960; 22: 1091.
3. Stone D, Shapiro S, Daufman DW, Rosenberg L, Meittinen OS and Stolley PD. Risk of myocardial infarction in relation to current and discontinued use of oral contraceptives, N. Eng. J. Med. 1981; 305-420.
4. Wahl P, Walden C, Knopp R, Hoover J and Wallace R *et al.* Effect of oestrogen progesterone potency on lipid/lipoprotein cholesterol. N. Eng. J. Med. 1983; 308 : 862-67.
5. Lipson A, Stoy DB, LaRosa JC, Muestng RA and Miller VT *et al.* Progestins and oral contraceptive-induced lipoprotein changes : a prospective study, Contraception. 1986; 34: 121-134.
6. Kannel WB. Possible hazards of oral contraceptive use. Circulation. 1979; 60: 490-1.
7. Kuku SB and Akinyanjy, PA. Fasting serum lipids and serum lipoprotein distribution during oral contraceptive therapy in Nigerians. J. Obstet. Gynecol. Brit. Commonwealth. 1973; 80: 750-3.