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Original Article

Duration of Oral Contraceptives Use and Risk of Development of Dyslipidemia among Women in Dhaka City

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Abstract

Background: Duration of oral contraceptive use is an important issue for the development of dyslipidemia among women. **Objective:** The purpose of the present study was to see the duration of use of OCP and the development of dyslipidemia among the women. **Methodology:** This case control study was carried out in the Department of Obstetrics & Gynaecology and Family Planning Department in collaboration with the Biochemistry Department at Sir Salimullah Medical College & Mitford Hospital, Dhaka from June 2009 to May 2010 for a period of one (1) year. Women using low-dose OC pill for more than one year were considered as cases group while women not using low-dose oral contraceptive pill were taken as control group of the study. Lipid profiles were performed in the laboratory in the fasting state from blood. **Result:** A total of 80 subjects were recruited for this study of which 40 women in case group and the rest 40 women were in control group. Duration of contraceptive use and serum lipids profiles were recorded. Level of serum total cholesterol, serum triglyceride, and serum LDL were significantly higher among the contraceptive users of > 5 years duration than those among 5 or < 5 years duration ($p < 0.001$). However, serum HDL level was low among both users and non-users ($p=0.556$). The risk of developing dyslipidaemia in women using low-dose oral contraceptive was more than 3-fold higher than that in non-users. **Conclusion:** In conclusion the greater the duration of oral contraceptive use the higher is the chance of dyslipidaemia. *[Journal of Science Foundation 2016;14(2):40-43]*

Keywords: oral contraceptive pill; dyslipidaemia; lipid profiles; duration of OCP use

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Introduction

The use of oral contraceptive pill by women has increased worldwide (Berenson et al., 2009). In current years governments and other organizations are campaigning for its use in order to space pregnancies especially in developing countries. Over the past four decades OCs has become the most widely used drugs (Van-Vlijmen et al., 2007). Millions of women world-wide use convenient birth control pill, which is both reliable and cost-effective (Masimasi et al., 2007). Therefore minimizing any side-effects associated with its use is of utmost importance.

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High-dose pill containing >50 µgm of EE was the first oral contraceptives to use (Roojjen et al., 2001). However, due to cardiovascular side-effects, these preparations are now abandoned. Low-dose EE is now widely used (Gasparada et al., 2005). These drugs are considered to have less side-effect on lipid metabolism. However, data are limited on the effects of low-dose oral contraceptives on the lipid profile (Mia et al., 2005). There are only three longitudinal studies. Therefore, it is not certain whether OCs containing <50 µgm of EE is safe for cardiovascular health (Naz et al., 2012). Long duration use of OCP is essential to develop dyslipidemia. Therefore, this present study was undertaken to see association between the duration of use of OCP and the development of dyslipidemia among the women.

Methodology

This case-control study was carried out in the Department of Obstetrics and Gynaecology and Family Planning Department in collaboration with the Department of Biochemistry at Sir Salimullah Medical College and Mitford Hospital, Dhaka from June 2009 to May 2010 for a period of one (1) year. The respondents were enrolled from the Family Planning Department of Mitford Hospital, Dhaka. Women of reproductive age (20 to 40 years) using low-dose OC pill containing 30 µgm EE plus 150 µgm LNG for more than one year were considered as case group while women not using low-dose OC pill were taken as control group. Women presented with known systemic diseases like liver, renal diseases, hypertension, diabetes, history of using beta-blockers, thiazide diuretics, glucocorticoids, smokers, alcoholics, women using other hormonal contraceptives were excluded from this study. Before commencing the research work, permission was taken from the Ethical Committee of SSMC, Dhaka. The required numbers of subjects were purposively included in the study. The demographic variables like age, weight and parity were recorded. After selection of study subjects, detailed history was taken and a careful physical examination was done. Subjects were requested to fast overnight (10-12 hours) and to report between 8 to 9 am next morning in the Department of Biochemistry at Sir Salimullah Medical Collage & Mitford Hospital, Dhaka for laboratory tests. To avoid diurnal variation, samples were collected always between 8 to 9 am. Collected data were processed and analyzed with help of SPSS (Statistical Package for Social Sciences), version 16.0. The test statistics used to analyze the data were Unpaired "t" Test and Chi-square Test. The level of significance was set at 0.05 and p-value < 0.05 was considered significant.

Results

The present study intended to determine the influence of OC pill use on lipid metabolism included 40 women who used low-dose OC pills for more than one year and 40 women who did not use them. The case group was again subdivided into women who used pill for ≤ 5 years and those who used it for 5 or > 5 years. The findings of the study obtained from data analyses are documented below. Table 1 shows no significant difference between the study and control groups regarding age, weight and parity (p = 0.865, p = 0.621, p = 0.737 respectively).

Table 1: Comparison of Age, Weight and Parity of the Study Subjects

Parameters	**Case (n=40)**	**Control (n = 40)**	**p-value**
Age (year)			
Mean ± SD	29.40 ± 4.43	29.23 ± 4.74	0.865
Range	20-40	21-40	
Weight (kg)			
Mean ± SD	52.98 ± 6.71	53.65 ± 5.39	0.621
Range	42-67	45-65	
Parity			
Mean ± SD	2.65 ± 1.31	2.55 ± 1.34	0.737
Range	0-6	0-7	

Data were analysed using **Unpaired t-Test** and were presented as **mean ± SD**.

Duration of contraceptive use and serum lipids profiles were recorded. Level of serum total cholesterol, serum triglyceride, and serum LDL were significantly higher among the contraceptive users of > 5 years duration than those among 5 or < 5 years duration (p < 0.001) (Table 2).

Table 2: Association between Duration of Contraceptive Use and Serum Lipids

Parameters	Duration of OCP use (years)		p-value
	≤ 5 (n = 20)	>5 (n = 20)	
Cholesterol (mg/dL)			
Mean ± SD	205.20 ± 23.09	239.25 ± 28.82	< 0.001***
Range	168-235	175-280	
Triglyceride (mg/dL)			
Mean ± SD	148.30 ± 27.99	190.30 ± 38.76	0.001***
Range	120-215	120-250	
HDL (mg/dL)			
Mean ± SD	30.45 ± 7.89	35.05 ± 10.71	0.132
Range	14-48	19-65	
LDL (mg/dL)			
Mean ± SD	145.09 ± 17.15	166.14 ± 19.90	< 0.001***
Range	110-167	120-190	

Unpaired t-Test was done to analyse the data.***Significant at 0.001

Risk of developing dyslipidaemia among contraceptive users was recorded. In this study more than 70% of dyslipidaemic subjects were contraceptive users compared to 39.6% of those who did not develop the same condition (p = 0.009). The risk of developing dyslipidaemia was estimated to be 3.6(1.7 – 9.7) times higher among contraceptive users than that among non-users (Table 3).

Table 3: Risk of developing dyslipidaemia among contraceptive users

Contraceptive	Dyslipidaemia		p-value	Odds Ratio (95% CI)
	Developed (n = 27)	Not developed (n = 53)		
User (n-40)	19(70.4%)	21(39.6%)	0.009**	3.6(1.7-9.7)
Non-user (n-40)	8(29.6%)	32(60.4%)		
Total	27(100.0%)	53(100.0%)		

Chi-square (χ^2) Test was done to analyze the data; Figures in the parentheses indicate corresponding percentage; **Significant at 0.01 level

Discussion

The oral contraceptive pills are used by the women in Bangladesh for a long time. The reason is that this contraceptive method is very effective as well as easily used by the women and still it has proved that it is highly effective. However, the components of OCP are steroidal hormones like the estrogens and progestogens which have various metabolic effects, including lipid metabolism impairment. This present study has been undertaken to estimate the major serum lipid levels in Bangladeshi women of reproductive age who use oral contraceptive pill for more than five years and to compare their lipid status with those women who do not use oral pills.

Serum cholesterol, LDL, triglyceride were significantly raised (p<0.001) in contraceptive users compared to their non-user counterparts, though the mean HDL level in majority of the subjects of both groups was low with no significant intergroup difference (p=0.556). One study has observed that the significant increase serum triglyceride, total cholesterol, apo-lipoprotien-B and LDL and slightly decreased HDL level after giving 12 cycles of OC containing EE 20 µgm in combination with levonorgestrel 100 µgm which also resemble the present study. It is already established that oral contraceptives (OCs) are the most popular type of birth control pills. Similarly Naz et al (2012) have performed a study to examine the biochemical changes which occur due to the use of oral contraceptive pills (OCs). The results showed statistically significant differences among users of OCs compared to non-users. Total cholesterol, HDL-C, LDL-C and triglycerides were significantly higher compared to the non-users. Therefore it has been concluded that OCs increase the level of high density lipoprotein cholesterol (HDL-C), low density lipoprotein cholesterol (LDL-C), total cholesterol (TC) and triglycerides (TG).

Asare et al (2014) have reported that total cholesterol and low density lipoprotein were significantly different in the oral contraceptive using group compared to the control group which is consistent with the present study. The higher results are obtained as a result of oral contraceptives use. Similar statistically significant TC and LDLC elevations in the long time use of OCP for 3 to 5 years were reported in a cohort of 140 subjects aged 20–35 years[6]. In the Toronto Nutrigenomics and Health Study, which involved 783 subjects, lipid metabolism biomarkers were also statistically significantly higher among HC users (Josse et al., 2009). However, the pattern was different in a study by Okeke et al[10] and had mentioned that 33 hormone contraceptive users were matched with 50 non-users of reproductive age in Nigeria. There was a significant change in TG and LDLC levels; TGs increased and LDL cholesterol decreased. The LDL cholesterol results obtained in the present study were similar to the findings of the study by Okeke et al. Furthermore, no statistically significant change in total cholesterol and high density lipoprotein cholesterol levels in women on oral contraceptive pills were observed in that study. However, a significant increase was observed in the total cholesterol of the oral contraceptive group. In the study by Okeke et al (2012) HDLC was significantly increased in the oral contraceptive users group. In a longitudinal study by Nessa et al (2007) in Bangladesh HDLC did not increase over a 5-year period. However, in the study by Berenson (2009) HDLC increased initially among oral contraceptive users which are dissimilar to the present study. Thus lipid profile biomarkers are therefore disturbed among the OCP users.

The present study estimated the risk of developing dyslipidaemia in women using low-dose oral contraceptive. Accordingly it is revealed that the users of oral contraceptive pills carry more than 3-fold higher risk of having dyslipidaemia than those of non-users. As the women with hypertension, diabetes and habit of smoking and alcohol consumption were excluded from the study higher risk of dyslipidaemia among contraceptive users than among non-users could be associated with oral contraceptive use.

Conclusions

In conclusion the greater the duration of oral contraceptive use the higher is the chance of dyslipidaemia. As the women with hypertension, diabetes and habit of smoking and alcohol consumption were excluded from the study higher risk of dyslipidaemia among contraceptive users than among non-users could be associated with oral contraceptive use.

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