

Comparative Study of Lipid Profile in Women Using Oral Contraceptive Pills Versus Non Oral Contraceptive Pills Users in Reproductive Age Group

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Abstract

Population explosion has posed a serious threat to the progress and survival of mankind. The Oral contraceptive pills (OCPs) quickly have become the most effective, acceptable and reversible contraceptive. OCPs contain an estrogen and progesterone. Serious side effects of OCPs are cardiovascular diseases such as myocardial infarction, thrombosis, cerebral hemorrhage, and arteriosclerosis. Many epidemiological studies have clearly indicated that arteriosclerosis and myocardial infarction are closely linked to an impaired lipid and lipoprotein metabolism and from such studies it's also documented that treatment of the lipoproteinemia will reduce the risk of coronary heart disease.

Keywords: Oral Contraceptive Pills (OCPs), High Density Lipoprotein Cholesterol (HDL); Low Density Lipoprotein Cholesterol (LDL); Total Cholesterol (TC) and Triglycerides (TG).

Introduction

An ideal contraceptive which should fulfill the following criteria - widely acceptable, inexpensive, simple to use, safe, highly effective, and requiring minimal motivation, maintenance and supervision and without side effects. OCPs containing an estrogen and progesterone constitute the most common method of contraception today. In addition to bleeding disturbances, the metabolic influences of OCPs are well documented. Among the most serious side effects described after OCPs use are the cardiovascular diseases such as myocardial infarction, thrombosis, cerebral hemorrhage. This study therefore suggests some potential cardiovascular diseases risk with OCPs use through an indirect mechanism deranging the lipid profile [5]. These side effects have decreased markedly with pills containing 30 - 35 µg of Ethylene estradiol or 50 µg of Mestranol being increasingly used. The two progestogens, currently most commonly used are Norethistrone and

Levonorgestrols. Both progestogens and estrogens are known to alter plasma lipid and lipoprotein composition [1]. However women who are using triphasic pills, do not show significant changes in lipid profile [2]. It has been demonstrated that in OCPs having identical estrogen and progestins with different androgenic potency produce major and different changes in plasma lipoproteins [3].

One study suggests that OCPs increase the level of HDL, LDL, TC and TG [4]. Very low dose OCPs containing desogestrel elevate high density and very low density cholesterol values while changes associated with depot medroxyprogesterone acetate are short-lived [6]. It is concluded that the use of combined OCPs, which contain estrogen and progesterone causes elevation in lipid profile, B.P and BMI in women. The women should be screened for lipid profile and blood pressure before starting OCPs and followed up regularly to prevent the risk of cardiovascular diseases in these women and to decrease disease burden [7]. The levels of total cholesterol were found significantly higher in groups using OCPs in relation to the control group. Total cholesterol sums the lipoproteins HDL, LDL, and VLDL, and probably presents higher levels in OCPs users due to the increase observed in the levels of VLDL and HDL [8].

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(Received on 24.09.2017, Accepted on 13.10.2017)

Aims and Objective

1. To study the effects of OCPs on serum TC & compare it with non OCPs users.
2. To study the effect of OCPs on serum TG & compare it with non OCPs users.
3. To study the effect of OCPs on serum HDL & compare it with non OCPs users.
4. To study the effect of OCPs on serum LDL & compare it with non OCPs users.

Material and Method

The samples were collected from the ladies registered on the MRA. Medical College. All women were subjected to the following protocols as detailed history, clinical examination, estimation of TC, TG, LDL, HDL There were three groups. First group consisted of age group of 18–40 yrs women. Precaution was taken to ensure that they did not consume any OCPS for at least 3 months prior to investigations and they were not suffering from any disease. Second group consisted total number of 30 women taking OCPS regularly for less than 6 months. Last group included women taking OCPS for more than 6 months, which included 30 women (Table 1).

Discussion

1. The analysis of the Serum Cholesterol levels amongst the oral pill users shows that 56 cases in Group A (Control) have their serum cholesterol values within normal range (150 - 250 mg / dl) with a mean

of 200 mg/dl (+/-S.E. 3.99). The values in Group B, mean serum cholesterol 253.33 mg/dl (+/-S.E. 5.77) and Group C, mean 250 mg / dl (+/- S.E. 5.22) were significantly higher ($p < 0.001$) than the control group A (Table 2 & 3).

In group B and C mean fasting serum cholesterol values were significantly higher ($p < 0.001$) than the control group A.

2. After analysis of serum triglyceride levels among oral pill users, it was found that the 56 cases in Group A had their serum triglyceride values were less than 250 mg /dl. The mean serum triglyceride levels in Group A, B & C being 96.67 mg /dl (+/-S.E. 3.97), 146.66 mg/dl (+/-S.E. 7.07) and 156.66 mg /dl (+/-S.E. 6.10) respectively (Table 4 & 5).

In group B & C serum triglyceride values were significantly higher ($p < 0.001$) than the control group- A. Triglyceride values of group B & C.

3. After analysis of serum HDL levels among oral pill users, it was found that the 58 cases in Group A had their serum HDL values were more than 40 mg / dl. The mean serum HDL levels in Group A, B & C being 53.33mg /dl (+/-S.E. 1.078), 46.33 mg/dl (+/-S.E. 1.71) and 45.66 mg /dl (+/-S.E. 1.78) respectively (Table 6 & 7).

In group B & C Serum HDL levels were significantly lower ($p < 0.001$) than the control Group - A. However, there was no significant difference ($p > 0.05$) between group B and C.

4. On analyzing serum LDL levels in different groups, it was observed that in control Group A S.LDL levels ranged between 51 - 150 mg / dl in majority of cases (93%) with a mean level of 142.50 mg/dl (+/-S.E. 3.99). The values of S. LDL in Group B and C

Table 1: Distribution of cases

Groups	Duration of pill intake	No. of Cases	Percentage
A (Control)	0 days	60	50
B (Study group)	1-6 months	30	25
C (Study group)	6 months and above	30	25
Total (n)		120	100

Table 2: Fasting serum cholesterol levels in different groups

Serum Cholesterol mg/dl	Group-A		Group-B		Group-C	
	No.	%	No.	%	No.	%
151-200	34	56.66	2	6.66	1	3.33
201-250	22	36.66	9	30.0	13	43.33
251-300	4	6.66	19	63.33	16	53.33
301	Nil	-	Nil	-	Nil	-
Total	60		30		30	
Mean	200		253.33		250	
S.D.	±30.95		±30.77		±28.13	
S.E.	±3.99		±5.71		±5.22	

Table 3: Significant relationship of serum cholesterol between different groups

Groups	't'	'p'	Inference
A Vs B	7.51	< 0.001	Significant
A Vs C	7.23	< 0.001	Significant
B Vs C	0.43	> 0.05	Not Significant

Table 4: Serum triglyceride levels in different groups of cases

Serum Triglyceride mg/dl	Group-A		Group-B		Group-C	
	No.	%	No.	%	No.	%
151-200	38	63.33	4	13.33	1	3.33
201-250	18	30.00	10	33.33	11	36.67
251-300	4	6.67	15	50.00	16	53.33
301	Nil	-	1	3.33	2	6.67
Total	60		30		30	
Mean	96.66		146.66		156.66	
S.D.	± 30.77		± 38.04		± 32.87	
S.E.	± 3.97		± 7.07		± 6.10	

Table 5: Comparison of serum triglyceride levels in groups a, b and c

Groups	't'	'p'	Inference
A Vs B	6.52	< 0.001	Highly Significant
A Vs C	8.29	< 0.001	Highly Significant
B Vs C	1.09	> 0.05	Not Significant

Table 6: Serum hdl levels in different groups of cases

Serum HDL mg/dl	Group-A		Group-B		Group-C	
	No.	%	No.	%	No.	%
31-40	2	3.33	7	23.33	8	26.67
41-50	12	20.00	15	50.00	16	53.33
51-60	30	50.00	6	20.00	3	10.00
61-70	14	23.33	1	3.33	2	6.66
71-80	2	3.33	1	3.33	1	3.33
Total	60		30		30	
Mean	53.33		46.33		45.66	
S.D.	+/- 8.35		+/- 9.21		+/- 9.63	
S.E.	+/- 1.078		+/- 1.71		+/- 1.78	

Table 7: Comparison of serum hdl levels in groups a, b and c

Groups	't'	'p'	Inference
A Vs B	4.54	< 0.001	Significant
A Vs C	4.78	< 0.001	Significant
B Vs C	0.27	> 0.05	Not Significant

Table 8: Serum ldl levels in different groups

Serum Cholesterol mg/dl	Group-A		Group-B		Group-C	
	No.	%	No.	%	No.	%
51-100	20	33.33	2	6.67	1	3.33
101-150	36	60	4	12.33	4	12.33
151-200	3	5	18	60	16	53.33
201-250	1	1.67	6	20	8	26.67
251	Nil	-	Nil	-	1	3.33
Total	60		30		30	
Mean	142.55		253.33		250	
S.D.	+/-30.95		+/-30.77		+/-28.13	
S.E.	+/-3.99		+/-5.71		+/-5.22	

Table 9: Significant relationship of serum ldl between different groups

Groups	't'	'p'	Inference
A Vs B	7.63	<0.001	Significant
A Vs C	8.75	<0.001	Significant
B Vs C	1.27	>0.05	Not significant

were significantly higher as compared to Group A ($p < 0.001$). Mean values S.LDL in group B being 253.33 mg/dl (+/- S.E. 5.71) and in Group C 250 mg/dl (+/- S.E. 5.22). Significant difference ($p < 0.001$) was seen between groups A and B as well as groups A and C. (Table 8 & 9).

In group B and C serum LDL values were much higher (0.001) than the control group A. Serum LDL level in Group C was insignificantly higher ($p > 0.05$) than the group B.

Conclusion

The mean serum HDL levels have shown a significant fall in study group ($p < 0.001$); however there was insignificant difference ($p > 0.05$) between group B & C when compared to each other.

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