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Serum Cholesterol and Triglyceride Level in Combined Oral Contraceptive Sudanese Users

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Abstract: Objectives: *The study aimed to estimate serum cholesterol and triglycerides levels in women using combined oral contraceptives pills (COC).*
Methodology: *70 women aging 15-45 years (50 as test group, women using combined oral contraceptives pills (COC), and 20 women don't use COC pills, as control group) were involved in this study. 3ml blood samples from both groups were collected into plan containers. Serum was separated by centrifugation then cholesterol and triglyceride levels were estimated by enzymatic colorimetric method. Data were analyzed statistically by SPSS program.*
Results: *The average or the mean of serum cholesterol levels in control group is 111mg/dl, in the test group is 145 mg/dl, p-value 0.005. The average or mean of serum triglycerides levels in control group is 72 mg/dl, and in the test group is 101 mg/dl, p-value of 0.000. The statistical analysis reflected that there was a significant deference between the two means of both groups.*
Conclusion: *The study concluded that the levels of serum cholesterol and triglycerides are affected by the administration of oral contraceptive pills in females of child bearing age, especially for a long period of time.*

Keywords: Combined oral contraceptive pills, Serum cholesterol, Serum triglyceride.

INTRODUCTION

Hormonal contraception means birth control method that acts on the endocrine system. The most widely used methods of hormonal contraception are oral tablets (combined estrogen and progestin) or injectable (progestin only) [1]. Most of the oral contraceptives contain a combination of estrogen and progestin, the doses of which have been progressively decreased over years. Ethinyl estradiol is the most frequently used estrogen in combined oral contraceptive pills in a dose range from 20-35 ug. The adverse effects associated with oral pills decrease indirect proportion to the reduction of the estrogenic content[2] .There is increased risk of coronary heart disease associated with elevated concentrations of plasma total cholesterol and low density lipo-protein, decreased plasma concentration of high density lipoprotein and in some circumstances, high levels of total triglycerides[3]. Before starting oral contraceptives, measurement of lipid profile is recommended in women with dyslipaedemias and alternative non hormonal contraceptive should be sought out if low density lipoprotein- cholesterol is not below 160 mg/dl[4]. The lowest dose pill containing estrogen and progesterone which can provide good cycle control and pro-duce minimal effect on lipid and carbohydrate metabolism should be prescribed[5]. Estrogens and progestogens in combined oral contraceptive pills can affect on lipids[6]. Estrogen increases high density lipoprotein cholesterol, triglycerides and insignificantly alters total cholesterol whereas progestin decreases high density lipoprotein cholesterol levels[7]. These effects are produced by following mechanisms: reductions of total cholesterol and LDL-C suggest estrogen inhibits LDL oxidation in a process not counteracted by progestins, conjug-ated estrogens augment serum triglycerides[8].
This study was conducted to determine the effect of combined oral contraceptive pills (COC) on Serum cholesterol and triglyceride level in females of child bearing age.

SUBJECTS AND METHOD

This comparative cross sectional study was done at Khartoum state, Sudan. A total of 70 married fertile women in their reproductive age (15-45) were selected. They were divided in two groups: Group 1 (controls-20) and Group 2 (combined oral contraceptive users-50). Subjects included in group 1(controls) were married fertile females in reproductive age group (15-45 years) who had not used any kind of hormonal contraceptives and were non pregnant and non lactating. Subjects included in group 2 (combined oral contraceptive users) were married fertile females in reproduce-tive age group (15-45 years) using combined oral pills at least for the last one year and were non pregnant and non lactating. Subjects with hypert-ension, cardio-vascular disease, diabetes mellitus, and liver disease were excluded. Samples of venous blood were taken after an overnight fast (8-12 hours), 3ml collected in plan container for each subject in both groups, allow to stand for 30 minutes at room temperature before centrifuged at 1500 rpm for 5 minutes. Care being taken to standardize the effects of posture and hydrostatic pressure on serum lipid levels. Serum cholesterol and triglyceride levels were measured by enzymatic colorimetric method.

STATISICAL METHOD

Different variables presented as mean ± SD. We used SPSS program and T-test for the analysis of variance between two groups. The P value less than 0.05 were considered significant.

RESULTS

The mean age of the patients in group 1 (control) was 27±5 years, and in group 2 (combined Oral contraceptives) was 30±3 years. For subjects in group 1 (control) and group 2 (combined oral contraceptives users) the mean ± SD concentration of serum total cholesterol was 145±33mg/dl and 111±41 mg/dl, respectively, The mean ± SD concentration of serum total cholesterol was significantly (p=0.005) increased in group 2 (combined oral contraceptive users) as compared to group 1 (control).

For subjects in group 1 (control) and group 2 (combined oral contraceptives users) the mean ± SD concentration of serum triglycerides was 101±34 mg/dl and 72±28 mg/dl, respectively, The mean ± SD concentration of serum triglycerides was significantly (p<0.000) increased in group 2 as compared to group 1.

Table 1: Comparison of mean serum total cholesterol and triglycerides between Group 1 and group 2.

variables	Group1(n=20) (mean ± SD)	Group2 (n= 50) (mean ±SD)	p.value
Serum T.cholesterol	111±41	145± 33	0.005
serum triglyceride	72± 28	101± 34	0.000

Table 2: shows the duration of oral contraceptive pills administration

Time duration	Frequency	Percent
1 - 2 years	29	%58
2 - 3 years	11	%22
3 - 4 years	5	%10
4 - 5 years	5	%10
Total	50	%100

DISCUSSION

The use of hormonal contraceptives by women all over the world is on the increase, especially in recent years when various governments and organizations are campaigning for its use in order to space pregnancies especially in developing countries, like Sudan. The major health risks of oral contraceptives and injectables are cardiovascular diseases particularly coronary artery disease, stroke and venous thromboembolism. There is increased risk of coronary heart disease associated with elevated concentrations of plasma total cholesterol and low density lipoprotein, decreased plasma concentration of high density lipoprotein and, in some circumstances; high levels of total triglycerides[9].

In our study included two groups: controls and combined oral contraceptives users. There was a significant increase in serum total cholesterol and triglycerides in subjects using combined oral contraceptives as compared to control. Estrogen increases liver lipogenesis which results in elevated levels of triglycerides, VLDL and HDL-C levels and also causes an increase in the synthesis of hepatic LDL-C receptors and a resulting increase in the removal of serum LDL-C and hence reduction in its levels. Many authors have observed increased levels of triglycerides[10]. *Bianca Stocco et al* also found a significant increase in serum T. cholesterol and triglyceride in Brazilian Women[11]. In *Greenlund KJ et al* study In 1985-1986, white COC users had significantly ($p < 0.05$) higher adjusted mean total and low density lipoprotein (LDL) cholesterols, and lower high density lipoprotein (HDL) cholesterol compared with nonusers; black OC users had higher triglycerides and LDL cholesterol, and lower HDL cholesterol[12].

CONCLUSION

The study concluded that the levels of serum cholesterol and triglycerides are affected by the administration of oral contraceptive pills in females of child bearing age, especially for a long period of time.

REFERENCES

1. Rickert VI, Tiezzi L, Lipshutz J, Leon J, Vaughan RD, Westhoff C. Preventing unintended pregnancies among adolescents and young adults. J Adol Health 2007; 40: 22-8.
2. Berenson AB, Rahman M. Changes in weight, total fat, percent body fat, and central-to-peripheral fat ratio associated with injectable and oral contraceptive use. Am J Obstet Gynecol 2009; 200: 329-31.
3. Schufelt CL, Merz NB. Contraceptive hormone use and cardiovascular disease. J Am Coll Cardiol 2009; 53: 221-31.

4. Berenson AB, Rahman M and Wilkinson G. Effect of injectable and oral contraceptives on serum lipids. Obstet Gynecol 2009; 114: 786-94.
5. Beasley A, Estes C, Guerrero J, Weathoff C. The effect of obesity and low dose oral contraceptives on carbohydrates and lipid metabolism. Contraception 2012; 85: 446-52.
6. B. Seema, M Amna, Memon Z, Bibi M. Contraceptives knowledge and the practices in two districts of Sindh, Pakistan: a hospital based study. J Pak Med Assoc 2008; 58: 254-8.
7. Hogan MC, Foreman KJ, Naghavi M, et al. Maternal mortality for 181 countries, 1980-2008: a systematic analysis of progress towards Millennium Development Goal 5. Lancet 2010; 375: 1609-23.
8. Macmohn AP. Hormonal contraceptive use. Contraception 2007; 77: 170-6.
9. Duvillard L, Dantin G, Florentin E et al. Increased apolipoprotein A1 production rate and redistribution of high density lipoprotein size induced by estrogen plus progestin as oral contraceptive. J Clin Endocrinol Metab 2009; 94: 4891-7.
10. Lizarelli PM, Martins WP, Vieira CS, Soares GM, Franceschini SA, Ferriani RA, et al. Both a combined oral contraceptive and depot medro-xyprogesterone acetate impair endothelial function in young women. Contraception. 2009; 79: 35-40.
11. Bianca Stocco, Helen F. Fumagalli, Silvio Antônio Franceschini,et el. The Effect of Different Contraceptive Drugs on the Lipid Profile of Brazilian Women. 2013, 4:1.
12. Greenlund KJ, Webber LS, Srinivasan S, Wattigney W,et al. Associations of oral contraceptive use with serum lipids and lipoproteins in young women: the Bogalusa Heart Study. 1986.