ORIGINAL ARTICLE
Effect of Combined Oral Contrraceptive Pills on Serum Total Cholesterol and Body Mass Index in Females of Reproductive Age Group

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ABSTRACT

Objective: to find out the effect of combined oral pills on serum total cholesterol as well as Body mass Index (BMI) in two groups: females who were not using any method of hormonal contraceptives (controls) and the subjects using combined oral contraceptive pills in their reproductive age (15-49yrs)

Material and Methods: This study was created and executed for this goal at Hazara University in Mansehra. Two groups of 200 married, fertile women who were not pregnant or nursing were created: Group 1 consisted of controls (females who did not use any hormonal contraception), and Group 2 consisted of participants taking combination oral tablets (COCs). The laboratory derived variables studied was serum total cholesterol. BMI was calculated. It was decided to use a 5% level of significance (p0.05). With the help of Pearson's correlation coefficient r, the relation was established.

Results: Serum total cholesterol showed a statistically significant difference. BMI and serum TC did not statistically associate with one another. BMI and serum total cholesterol were positively connected in group 1 and negatively correlated in group 2, respectively.

Conclusion: This study facilitated to find out a simple and save method for an efficient and reliable mode of hormonal contraception for practice by general population

Keywords: Hormonal contraception, combined oral pills, serum total cholesterol

INTRODUCTION

Contraception improves reproductive health by helping men and women to have the freedom of choice to select the time of pregnancy and number of children[1]. Hormonal pills, injectables, implantable rods transdermal gels, skin patches, vaginal rings and intrauterine devices are various methods of using hormones as contraception[2]. One of the most widely and universally used methods of birth control is the oral contraceptive pill (OCP). COCs have been in use for more than 50 years and are widely acknowledged as a very safe and effective way of contraception[3]. In the industrialised world, where they account for roughly 25% of all contraceptive use, pills are particularly more popular and widely utilised [4]. In the industrialised world, where they account for roughly 25% of all contraceptive use, pills are particularly more popular and widely utilised [5],[6]. A key risk factor primarily caused by atherosclerosis, is altered lipid profiles[7]. Before beginning COCs, women with dyslipedemia are advised to assess their lipid profiles. If their serum total cholesterol is between 180 and 220 mg/dl and their LDL-C is not below 160 mg/dl, they should look into alternate non-hormonal contraceptives[8].

Body mass index is a commonly used metric for describing the ratio of weight to height. The BMI has the strongest correlation with body fat than of any measure of height and weight[9],[10]. The effectiveness of combination hormonal contraception, especially oral contraceptives, may be impacted by obesity[11].

Dilution is one potential mechanism for this impact; steroids may become less available as a result of increased blood circulation or fat sequestration[12]. The degree of metabolism changes as a result of OCs since both the oestrogen and progesterone found in these pills have the potential to temporarily increase fluid retention. This effect frequently starts in the first month due to an increase in sodium. Progesterone included in oral contraceptives increases hunger and results in long-term weight gain[13]. Estrogen is the culprit behind weight gain (growth in hips, breast size, or thigh size), and this rising body weight appears to be linked to young women's rates of estradiol metabolism[14].

MATERIAL AND METHODS

Total of 200 females in their reproductive age (15 to 49 years) were included in the study. The duration of study was about one year. Non-probability convenience sampling was used to choose the subjects for two groups: comparison group Group 1 (Controls) and study group Group 2. (Combined oral contraceptive users). The subjects in the comparison group were married, fertile women in the 15–49 age range who weren't lactating or using any hormonal contraception. Women using oral contraceptives, especially combined oral pills, and women with high blood pressure, heart diseases, type 2 diabetes, or liver disease were eliminated as subjects. The study group's participants were married, fertile females between the ages of 15 and 49 who had been taking combined oral tablets for at least a year. Women who are not lactating or pregnant Hypertension, cardiovascular illness, diabetes mellitus, liver disease, abnormal nipple discharge, and unexplained vaginal bleeding were among the disorders from which subjects were eliminated.

Using the following formula, the BMI was determined using weight and height measurements: BMI is calculated as follows: Weight in kg/Height in metres. The measurement of serum cholesterol was done using the Cholesterol Oxidase-PAP Method. Written informed consent was obtained before registration from all the subjects. On a questionnaire proforma, the individuals' thorough history and examination were recorded. The result of laboratory-derived variable was entered on proforma. A well-designed questionnaire was utilised to collect data on the individuals' sociodemographic profile, individual bio data, and state of health. To maintain secrecy, the questionnaire was delivered to each participant to be filled out in a secluded space.

SPSS version 19.00 was used to enter the data into the computer system. For quantitative data, the mean and SD (standard deviation) were provided. The significance level was set at less than 0.05, or 5%. For the two experimental groups and the combined data, coefficients of correlation between different parameters were calculated independently in order to quantify relationships between them.

RESULTS

 Patients in the control group (group 1) had an average age of 30.46.1 years, whereas patients in the COC group (group 2) had an average age of 28.94.9 years. Patients in group 1 had an average height of 157.89 6.78 centimetres, while patients in group 2 had an average height of 155.60 5.71 centimetres. According to

the data analysis, the average patient weight in group 1 was 61.99 + 6.59 kg, while the average patient weight in group 2 was 61.77 + 6.72 kg. In addition, the Body Mass Index (BMI) for both groups was almost the same. In the control group, the mean and standard deviation of BMI was 24.94 + 2.98, but in the COC group, it was 25.61 + 3.37. The mean and standard deviation of the serum total cholesterol concentration was 177.74 mg/dl for the control group and 176.42 mg/dl for the COC group, respectively, when comparing the two groups. The study indicated that there was a difference between the two groups that was statistically significant (p = 0.001).

With the help of Pearson's correlation coefficient r, the link was established. There was no discernible relationship between BMI and serum total cholesterol in the two groups. The blood indicators and BMI in group 1 (the control) did not substantially correlate. Figure 1 shows a relationship between BMI and serum total cholesterol that is positive. The serum marker and BMI in group 2 (COCs) did not substantially correlate. BMI was negatively correlated with serum total cholesterol shown in figure 2.

Table 1: Association of BMI and Serum markers among the patients enrolled in the study

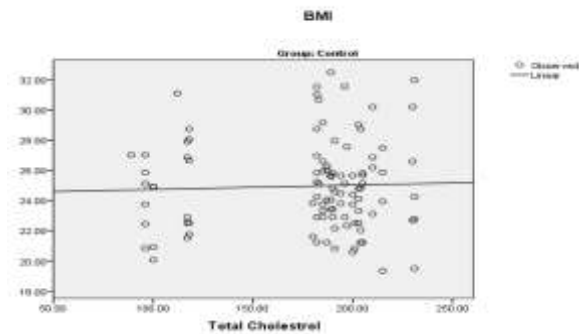| Groups		Serum TC
Group 1 control(n=100)	Pearson r	0.04
	p-value	0.70
Group 2 (COC) (n=100)	Pearson r	-0.007
	p-value	0.945

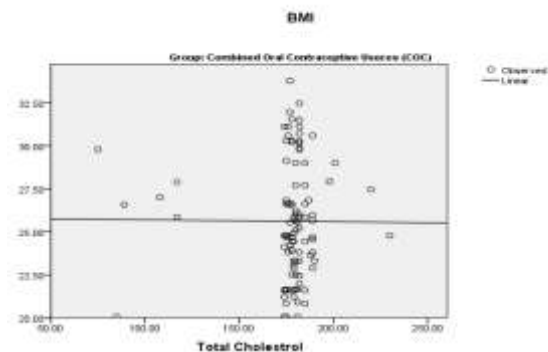Figure 1: Association of BMI and serum total cholesterol in control group

Figure 2: Correlation of BMI with serum total cholesterol in group 2 (COCs)

DISCUSSION

Low estrogen/progesterone dosage of combination contraceptives has been found to lessen the negative effects of plasmatic lipids and lipoproteins[15]. Studies on oral contraceptive use in Western countries have revealed that hormonal contraceptives alter blood total cholesterol levels[16]. The link between the usage of many medications and the risk of cardiovascular disease has yielded varying outcomes[17]. In the current investigation, there was a statistically significant difference between the two groups' serum levels of total cholesterol. Compared to group 1, it increased in group 2 (COCs) (control). According to a study with the same findings, the combined oral pills increased total cholesterol by 5% while having no effect on low-density lipoprotein cholesterol when compared to non-users[18]. Researchers found that COC users significantly increased their serum total cholesterol levels more than non-hormonal contraceptive users during the course of their study[19].

When energy input exceeds energy output, body mass index is a useful indirect approach to assess body fat that builds up in the body[20]. In the current study, the BMI of COCs users (25.61±3.37) was higher than that of controls (24.94±2.98). When counseling obese women on contraceptive options, it's also important to take into account their age, smoking habits, and pregnancy risks. Users of hormonal contraceptives had BMIs that were almost overweight (25-30)[21]. Our results support some experts' conclusions that using oral contraceptives increases women's appetites, which leads to weight gain and abnormally high serum lipid contents [22]. Additionally, we discovered that female users of combined oral tablets had higher BMIs than controls. Similar to this, weight change is not typically a primary finding in clinical trials of the combined oral tablets, and those studies were brief. In their study, 81.2% of participants thought that weight gain was an adverse effect of oral medications that were combined[23]. Additionally, they discovered some evidence suggesting a connection between weight gain and the usage of hormonal contraceptives[24]. Contrary to a study that found a substantial impact of using hormonal contraceptives on TC (P=0.000), our findings indicated that there was no statistically significant association between BMI and blood total cholesterol. They came to the conclusion that using hormonal contraceptives is linked to large rises in BMI and TC[25]. Unfavorable lipid profiles and BMI, which are thought to be metabolic risk factors for the development of cardiovascular illnesses, were discovered in a different investigation[26].

COCPs, which contain oestrogen and progestin, are popular birth control tablets. These hormones thicken cervical mucus, thin uterine lining, and suppress ovulation to prevent conception. However, COCPs may cause cholesterol and body mass index alterations (BMI). COCPs may raise women's total cholesterol, which may increase their risk of heart disease. COCPs may also cause weight gain or body composition alterations in women, affecting their BMI. COCPs can affect cholesterol levels and BMI in reproductive-age women, depending on the pill's kind and dosage and the woman's health and lifestyle.[27,28] COCPs were tested on reproductive-age women's blood total cholesterol and body mass index. The study examined the control and COC groups' cholesterol levels and BMI to see if there was a meaningful difference. The study also examined the effects of participants' age, weight, height, and BMI. The study also examined COCP duration and serum total cholesterol and body mass index variations. The study also examined how genetics, lifestyle, and health status affected cholesterol levels and BMI changes due to COCP use.

CONCLUSION

The purpose of this research was to examine how COCPs affected total serum cholesterol and body mass index in reproductive-aged women. Participants' ages, heights, weights, and body mass indexes were also measured and analyzed for their potential effects on the findings. In neither group was there a correlation between body mass index and total cholesterol levels in the blood.

Recommendations: Based on these findings, it is advised that people start each session of combination oral contraceptives (the course may last 3-6 months) with body weight monitoring and a lipid profile assessment.

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