LIPID PROFILE AND C-REACTIVE PROTEIN IN SUDANES WOMEN USING CONTRACEPTIVE IN KHARTOUM STATE

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ABSTRACT

Background: Continual use of contraceptives have been linked to risk of cardiovascular disease. **Objectives**: This study was aimed to assess serum levels of lipid profile and C - reactive protein as indicator of cardiovascular disease in women using contraceptive. **Material and Methods:** In central health care based matched cross sectional study was conducted in Khartoum state –Sudan during the period from January 2015 to march 2016. After signing written informed consent, blood sample was collected from 100 fasting women using contraceptive as case group and 70 fasting women not using contraceptive as control group aged from (25-40)years and serum level of cholesterol, triglyceride, HDL, LDL and CRP was measured using spectrophotometrical methods. Data were collected using structural questionnaire. Data analysis was carried out by means of statistical package for social science (SPSS). **Result:** The study compared between women using contraceptives and non using contraceptives and showed significant increase in mean of serum level of total cholesterol(**194.2±55.3vs170±29.3**), triglyceride (**188±87vs129.4±33.1**), LDL(**130±50 vs 93±31.3**) and CRP(**7.3±5.8 vs 4.7±3.0**) (p< value 0.05) and decreased in HDL (**24.4±11.3 vs 51.2±14.5**), (p value <0.05). Age and body mass index did not show significant difference when compared with control group. **Conclusion:** continual use of contraceptive is associated with increased level of cholesterol, triglyceride, LDL and CRP and decrease in HDL and this may be linked to increase risk of cardiovascular disease.

KEYWORDS; Lipid profile, Contraceptive, Sudan.

INTRODUCTION

Contraceptive hormones, most commonly prescribed as oral contraceptives (OC) and other type (inject /intradermal /intrauterine) are a widely utilized method to prevent ovulation, implantation and therefore pregnancy.[1] The Women's Health Initiative demonstrated cardiovascular risk linked to menopausal hormone therapy among women without pre-existing cardiovascular disease, prompting review of the safety, efficacy and side effects of other forms of hormone therapy.[2][3] Oral contraceptives (OCs), also known as "the pill", are the most popular method of contraception among female adolescents the primary mechanism ofaction is inhibition of ovulation.[2] In addition, oral contraceptives produce an endometrium that is not receptive to ovum implantation and cervical mucus that becomes thick and hostile to sperm transport.[4] Tubal and endometrial motility are slowed. There are two types of oral contraceptives: perm transport.[4] Tubal and endometrial motility are slowed. There are two types of oral contraceptives Combine oral contraceptives (COCs), which contain an estrogen and progestin. Progestin-only

contraceptives (POPs), which contain a progestin but no progestin.

This pill is often referred to as "the minipill. iplant; it is single implant inserted into the upper arm it is contain progesterone only. The hormone is released into the body at a steady injection; (shot); the type of shot most used is called Depo-Provera it is given every three month it is hormone much like the progesterone intra uterine device; is small device which placed into the uterine cavity. there are two types hormonal or copper based device lipid panel is a panel of blood tests that serves as an initial broad medical screening tool for abnormalities in lipids, such as cholesterol and triglycerides. The results of this test can identify certain genetic diseases and can determine approximate risks for cardiovascular disease.[4][5]

Increasing concentrations, of LDL particles are strongly associated with increasing risk of atherosclerosis within the walls of arteries[5][6] over time, eventually resulting in sudden plaque rupture and triggering clots within the

artery opening, or a narrowing or closing of the opening, i.e. cardiovascular disease and stroke.[7]

Cholesterol plays a major role in human heart health. Cholesterol can be both good and bad. High-density lipoprotein (HDL) is good cholesterol and low-density lipoprotein (LDL) is bad cholesterol.[13]

High cholesterol in serum is a leading risk factor for human cardiovascular disease such as coronary heart disease and stroke[6] **high density lipoprotein** HDL is called "good cholesterol" that is good for the cardiovascular. Increasing concentrations of HDL particles are strongly associated with decreasing accumulation of atherosclerosis within the walls of arteries.[8]

low density lipoprotein
LDL is called "bad cholesterol" that is bad for the cardiovascular system. These are the form in which cholesterol travels in the blood. LDLs have little protein and high levels of cholesterol and HDL has a lot of protein and very little cholesterol. LDL is the main source of artery clogging plaque-**Triglyceride:**, or triacylglycerol, are a type of fat present in foods and synthesized by your body.[7] A normal serum triglyceride level is less than 150 mg/dL. Higher levels may contribute to hardening of the arteries, which increases risk of stroke and heart disease. C-reactive protein (CRP) is an annular (ring-shaped), pentameric protein found in the blood plasma, the levels of which rise in response to inflammation.[8]

This study designed to assess lipid profile (cholesterol and triglyceride and high density lipoprotein and low density lipoprotein and c-reactive protein) in women utilized hormonal contraceptive in Khartoum state-sudan.

MATERIAL AND METHODS
This study was done in Khartoum state –sudan during the period from January 2015 to march 2016. A total of 100 women used contraceptive., 50 women receiving oral contraceptive, 16 women used intradermal 16 women used IUD and 18women used injection were randomly selected. The control group 70 randomly selected from women not using contraceptive. Both groups were 20-45

years. those women Lower 20 year, over 45 years, smokers, pregnant, familial history of heart disease, use other hormone medication and menstrual disorders were excluded from the An informed consent was obtained from each participant in the study after explaining objective of the study .interview and questionnaire was used to collect data . 5 milliliter of venous blood was be collected from each participant and control group, serum was separated from the plain container by centerfugation at (300rpm) for 5 minutes then lipid profile carry out by measure serum level of cholesterol, triglyceride, HDL and LDLusing (atomic absorption spectrophotometer) and serum level of CRP by use terbedemetric method.

Statistical analysis was performed using statistical package for windows (SPSS v16). Fisher's exact test was used to assess the categorical variables and student *t*-test or kruskal Walis for continuous variables. Correlation between quantitative parameters was assessed with Pearson correlation test. Data are presented as mean ± standard deviation (SD). *P* value less than 0.05 was considered statistically significant.

RESULT
Hundred women used different type of contraceptive among different period act as study group and seventy women not used contraceptive as control group aged from 25-40 years were enrolled in the study the mean±SD of age per year was31.8±5.7). The mean of BMI, cholesterol, triglyceride, LDL HDL show significance increase compared with control as shown in table (4-1).

CRP showed significance increase when compared with control group as shown in table (4-1).

Considering the type of contraceptive used cholesterol was significantly increase in female using combined contraceptive p value <0.05, however in the other types no significance difference p value >**0**.05. triglyceride was increased in female using combined and progestin type. HDL was affected in all types of contraceptive. LDL was changed in whose using combined injection and intradermal and changed in other types. CRP has no significance change in all types of contraceptives except in IUD.

Table 4-1 Comparison of mean (SD) of lipid profile, BMI and CRP between case and control

Variable	Cases (n= 100)	Control (N=70)	p. value
Age (years)	31.8± 5.7	29.5±6.7	**0.016**
Body mass index	27.7± 4.4	31.8± 5.7	**0.004**
Duration	2± 1.9		
Cholesterol mg/dl	194.2± 55.3	170± 29.3	**0.001**
Tri glyceride mg/dl	188± 87	129.4± 33.1	**0.000**
HDL	24.4± 11.3	51.2± 14.5	**0.000**
LDL	130± 50	93± 31.3	**0.000**
CRP	7.3± 5.8	4.7± 3.0	**0.001**

Table (4-2): Multiple mean differences of cholesterol, triglyceride, HDL, LDL and CRP between case subgroups and control groups.

Variable	Combined mean±SD N =(37)	Progestin mean±SD N= (13)	Injection mean±SD N=(18)	Intradermal mean±SD N=(16)	IUD mean±SD N=(16)
Cholesterol	0.2±69 21	188.1±62	177.8±39.3	186.5±35.2	184.3±36.2
P. value	0.000	0.736	**0**.971	0.642	**0**.761
Triglyceride	214.6±106.7	225.5±102.3	149.2±59.7	156±39.7	174±55.9
P. Value	0.000	**0**.000	**0**.679	0.540	**0**.084
HDL	27.5±12.9	23.8±8.6	19.5±7.9	21±9.9	26.2±11.5
P. Value	0.000	0.000	0.000	0.000	0.000
LDL	135.3±65.6	112.8±55.3	129±33.6	129±33.6	123.1±32.6
P. Value	0.000	**0**.612	0.010	**0**.003	0.064
CRP	5.6± 2.7	5.3±2.6	5.2±3.1	4.5±1.5	17.9±6.7
P. Value	0.688	**0**.994	0.986	0.999	0.000

Data represent mean ± SD
p.value ≤ 0.05 is significant

DISCUSSION

Contraceptive hormones are widely use in birth control and it is very effective methods. Hyperlipidemia, may promote endothelial dysfunction, leading to the development of atherosclerosis and cardiovascular diseases. High concentrations of oxidized LDL may stimulate the production of pro-inflammatory molecules such as VCAM, ICAM and E-selectin, and therefore, initiate damage to the endothelium. The hormone estrogen, present in oral combined contraceptives, stimulates the production of HDL and reduces the production of LDL cholesterol preventing damage to the endothelium. Despite of this beneficial action of the estrogen to the endothelium, the hormone progesterone, which is also present in oral combined contraceptives and injection and intradermal and IUD may reduce the plasma concentration of HDL.

In this study there is significant difference in lipid profile and CRP between women using contraceptive and women not use contraceptive this agree with another studies Steck TL et al.[12]

This study showed there was significant difference in level of total cholesterol, between sup group of women using combined oral contraceptive and control group and there was significant difference in CRP between women used IUD and control.

There was no significant difference in total cholesterol, LDL and CRP between progesterone only and injection and intradermal and IUD contraceptive and control group.

The study showed significant difference in HDL between women used contraceptive and control group.

This study show significant difference in TG between women used oral contraceptive and control group.

This study is not in agreement to other study in HDL but agree with other study in higher levels of total cholesterol, triglyceride, LDL and that is closely similar to this study. Other study show there is higher level of HDL cholesterol, this study showed low level of HDL cholesterol and that in contrast to this finding.[12]

WHO in their study reported no risk of cardiovascular disease among users of injectable contraceptives.[14]

CONCLUSION

Continual use of contraceptive is associated with increased level of cholesterol, triglyceride, LDL and CRP and decrease in HDL and this may be linked to increase risk of cardiovascular disease .concerning the type of contraceptive the combined has great effect on lipid profile and CRP value than other types so it recommended to use the other types rather than combined form.

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