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Oral Contraceptive Pills Use and Hypertension

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Abstract:
Background and objective*: All over the world, 150 million women use Oral Contraceptive Pills (OCPs). Because of such a high consumption level, any risky impact of these pills on public health would be important. The present study aimed to determine the relationship between consumption of OCPs and hypertension.*
Method: *In this retrospective, cross-sectional study, 165women below 40 years of age who used OCPs were selected by convenience sampling. Necessary information was obtained by a checklist containing demographic information, obstetric history, and OCPs use history based on the subjects' medical records. Besides, blood pressure and weight were measured at the beginning of OCPs consumption as well as 6 months and one year after that.*
Results: *The results showed a significant difference between the subjects' mean systolic blood pressure one year after OCPs consumption compared to the beginning (P=0.03). Moreover, this difference was related to the type of pills, such a way that it was significant in the patients who took Low Dose (LD) OCPs compared to those who used Triphasic pills (P=0.01).*
Conclusion: *Consuming the currently available OCPs that contain lower estrogen content had an insignificant effect on blood pressure. However, it is recommended to take care of blood pressure in order to identify the unique occasional responses.*
Keywords: *Oral contraceptive pills, Hypertension, Low dose pills*

I. Introduction

Oral Contraceptive Pills (OCPs) are very effective in prevention of pregnancy (1). OCPs are one of the most common methods of contraception in the world. These pills are popular, because they are effective, safe, and also reversible (2). Estrogen and progesterone present in these pills represent their main impact with an inhibitory effect on performance of hypothalamic gonadotropins, which includes suppression of LH and FSH secretion in the blood and prevention of increased inter-cyclic LH. It also has an effect on cervical mucus secretions of uterus endometrium as well as on secretion and movement of fallopian tubes and reduces the possibility of pregnancy (3).OCPs have advantages other than contraception, such as reducing dysmenorrhea, reducing the risk of ovarian and endometrial cancers, reducing the risk of benign breast diseases and ovarian cysts, improving hirsutism, and reducing the risk of iron deficiency anemia. However, they may also cause problems and complications for consumers (4). These pills have a wide range of side effects. Their short-term side effects include obesity, nausea and vomiting, dizziness, disgruntle, depression, and anxiety (5). Consuming OCPs significantly reduces the rate of hospitalization due to some diseases but, at the same time, using this method is the most common cause of secondary hypertension (6). It has been reported that these pills are, to some extent, the cause of hypertension. Hypertension in women who consume these pills increases with age and increased duration of treatment (7). In the case of consuming these pills, blood pressure should be controlled periodically and regularly. Nevertheless, this complication is less significant in the newer generation of OCPs. The majority of consumers have a moderate increase and about 5% of them have a significant increase in blood pressure that is 2-3 times higher than that in women who do not consume these pills. In most cases, hypertension has been reported to be mild to moderate, which returned to the normal level after discontinuation of OCPs consumption. Few cases of malignant blood pressure have also been reported (9). Considering that OCPs are widely used by women at reproductive ages and also the fact that they can increase blood pressure in some individuals, this study aims to determine the relationship between OCPs use and hypertension.

II. Materials And Methods

This retrospective, cross-sectional study was conducted on the medical records of the women referred to healthcare centers in Shiraz, Iran to receive family planning services during 2013. In order to select the subjects from all the healthcare centers, two centers were selected by random sampling technique. Then, the records of the women who consumed OCPs were selected and those of the women who had the inclusion criteria were studied. After all, 165 records were entered into the study. The inclusion criteria of the study were

using Triphasic or Low-Dose (LD) combined OCPs regularly at least for one year along with regular control and record of blood pressure and weight, being below 40 years old, and having no history of internal diseases, especially hypertension, at the beginning of OCPs use. On the other hand, the exclusion criteria were incomplete medical records. The study data were collected using a checklist containing demographic information, obstetric history, and OCPs consumption history, which was completed based on the subjects' medical records. The subjects' blood pressure and weight were also measured at the beginning of OCPs use as well as 6 months and one year after that. Finally, the data were analyzed by descriptive and inferential statistics using the SPSS statistical software (ver. 16). $P<0.05$ was considered as statistically significant.

III. Results

The mean age of the subjects was 27.8 years. The results showed no significant difference in the subjects' mean systolic blood pressure 6 months after using OCPs compared to the beginning (P=1). However, a significant difference was found in this regard after a year (P=0.03) (Table 1). Besides, this difference was related to the type of the pills, such a way that it was significant in the subjects consuming LD pills compared to those taking Triphasic(TF) pills (P=0.01) (Table 2). The results also revealed no significant difference in the subjects' mean diastolic blood pressure 6 months (P=0.7) and one year (P=0.15) after OCPs use compared to the beginning (Table 2). In addition, no significant relationship was observed between hypertension and weight, parity, and age above 30 years.

IV. Discussion

The estrogen existing in OCPs causes a significant increase in the plasma level of angiotensin close to that in normal pregnancy (10). The purpose of this study was to determine the effects of OCPs on women's blood pressure. According to the results, there was a significant difference in the subjects' mean systolic blood pressure one year after using OCPs. However, no significant difference was observed in their mean diastolic blood pressure 6 months and one year after OCPs consumption. In the study by Gillum, after controlling smoking and blood pressure, the incidence rate of heart attack was 1.93 times higher in the women consuming OCPs in comparison to the control group (11). Similarly, studies have demonstrated that arterial events in OCPs users are observed when they have other risk factors (12). Considering the effect of OCPs on hypertension, Dong et al. conducted a cross-sectional study on 3,545 women 892 of whom used OCPs. The study findings indicated that blood pressure was significantly higher among the consumers. The results still remained unchanged after adjustment of Body Mass Index (BMI), alcohol consumption, physical activity, and hypertension treatment. That study also revealed that only the OCPs containing progestin were not related to hypertension (13). The results of these studies regarding increase in systolic blood pressure were in agreement with those of the current study. In another study, diastolic blood pressure significantly increased in OCPs users (14). Bernardo also performed a research among postmenopausal women and reported a slight increase (about 2-4 mmHg) in diastolic blood pressure among OCPs consumers (2). These results were not consistent with those of the current study.

Several studies have demonstrated that hypertension was caused by obesity (about 77.5% of the subjects in these studies were obese) and that such patients could decrease their blood pressure by weight loss (15-16). Therefore, one of the most important measures to prevent and fight against cardiovascular diseases is community-based primary prevention. Examination, lifestyle modification, and control of blood pressure and lipids should be emphasized in primary preventions (17). Moreover, health service providers can greatly reduce the risks by selecting appropriate patients in terms of OCPs prescription as well as by appropriate follow-ups for future risks (18).

One of the limitations of this study was that the patients' blood pressure was recorded by different individuals at different times, which reduced the measurement accuracy.

V. Conclusion

OCPs are used by millions of women around the world. Hypertension is one the most serious side effects of these pills. Fortunately, since OCPs cause a dose-dependent effect on blood pressure, consuming the currently available pills with a lower estrogen level has a small effect on blood pressure. Yet, it is recommended to take care of blood pressure in order to identify the high-risk cases, follow health advices about proper nutrition, and avoid smoking. Studies with larger sample sizes and longer durations are also recommended for future works.

Conflicts of interest Statement: None declared.

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Table1. Comparison the mean systolic and diastolic blood pressure in OCP users

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval		P value
Systolic bp* before and 6 months after ocp use	0.0000	12.0581	0.9415	-1.8593	1.8593	1.00
Systolic bp before and 12 months after ocp use	-1.9697	11.7998	0.9186	-3.7835	-0.1559	0.033
Diastolic bp before and 6 months after ocp use	0.2744	9.4682	0.7393	-1.7343	1.1855	0.711
Diastolic bp before and 12months after ocp use	0.6970	10.7052	0.8334	-2.3426	0.9486	0.40

*Blood pressure

Table2.comparison the mean systolic and diastolic blood pressure regarding type of OCP

	Type of OCP	N	Mean	Std. Deviation	Std.Error Mean	P value
Systolic bp* before and 6 months after ocp use	LD	137	0.4745	11.8796	1.0149	0.798
	TF	23	-0.2147	12.5660	2.6202	0.807
Systolic bp before and 12 months after ocp use	LD	137	2.9927	11.2534	0.9614	0.010
	TF	24	-3.5417	12.0216	2.4539	0.019
Diacstolic bp before and 6 months after ocp use	LD	137	0.2920	9.4667	0.8088	0.708
	TF	23	1.0870	9.0398	1.8849	0.701
Diacstolic bp before and 12 months after ocp use	LD	137	1.5693	10.4098	0.8893	0.150
	TF	24	-4.1667	11.0006	2.2455	0.240

*Blood pressure

References

[1]. Berek J, Novak S. Gynecology. 15th ed. Philadelphia: Lippincott Williams & wilkins; 2012.p.439-508.
[2]. Speroff L, Fritz MA. Clinical gynecologic endocrinology and infertility, Lippincott Williams &Wilkins; 2005. P. 833-911.
[3]. Shulman LP. The state of hormonal contraception today: benefits and risks of hormonal contraceptives: combined estrogen and progestin contraceptives. Am J Obstet Gynecol. 2011; 205(4 Suppl): S9-13.
[4]. Blumenthal PD, Edelman A. Hormonal contraception. Obstet Gynecol. 2008; 112(3): 670-84.
[5]. Grossman D, Fernández L, Hopkins K, Amastae J, Potter JE. Perceptions of the safety of oral contraceptives among a predominantly Latina population in Texas. Contraception. 2010; 81(3):254-60.
[6]. Lubianca JL , Faccin CS , Fuchs FD. Oral contraceptives: a risk factor for uncontrolled blood pressure among hypertensive women.Contraception.2003;67(1):19-24.
[7]. Zakharova MY, Meyer RM, Brandy KR, Datta YH, Joseph MS, Shreiner PJ, et al. Risk factors for heart attack, stroke, and venous thrombosis associated with hormonal contraceptive use. Clin Appl Thromb Hemost. 2011; 17(4):323-31.
[8]. Kharbanda EO, Parker ED , Sinaiko AR, Daley MF, Margolis KL, Becker M, Sherwood NE, Magid DJ, O'Connor PJ. Initiation of Oral Contraceptives and Changes in Blood Pressure and Body Mass Index in Healthy Adolescents. The Journal of Pediatrics.2014;165(5): 1029–33.
[9]. August P .Hypertension in Women. Advances in Chronic Kidney Disease.2013; 20(5): 396–401.
[10]. Lubianca JN, Moreira LB, Gus M, Fuchs FD. Stopping oral contraceptives: an effective blood pressure-lowering intervention in women with hypertension. Journal of Human Hypertension. 2005; 19: 451–55.
[11]. Gillum LA, Mamidipudi SK, Johnston SC. Ischemic stroke risk with oral contraceptive. JAMA.2000; 284(1): 72-8.
[12]. Curtis KM, Mohllajee AP, Martins SL, Peterson HB. Combined oral contraceptive use among women with hypertension: a systematic review. Contraception, 2006; 73(2):179-88.
[13]. Doing W, Colhoun HM, Poulter NR. Blood pressure in women using oral contraceptive. J Hypertens. 1997; 15(0): 1063-8.
[14]. Asare GA, Santa S, Ngala RA, Asiedu B, Afriyie D, Amoah AGB. Effect of hormonal contraceptives on lipid profile and the risk indices for cardiovascular disease in a Ghanaian community. Int J Womens Health. 2014; 6: 597–603.
[15]. Duff EM. Impact on blood Pressure control of a six-month intervention Project. West Indian Med J. 2000; 49(4): 307-11.
[16]. Blumental JA. Exercise and weight loss reduce blood pressure in men and women with mild hypertension. Effects on cardiovascular, metabolic, and hemodynamic functioning. Arc. Intern. Med. 2000; 160(13): 1947-58.
[17]. Thom T, Haase N, Rosamond W, Howard VJ, Rumsfeld J, Manolio T, et al. Heart disease and stroke statistics-2006 update: A report from the American heart association statistics committee and stroke statistics subcommittee. Circulation. 2006 14; 113(6): e85-151
[18]. Castelli WP. Cardiovascular disease: pathogenesis, epidemiology, and risk among users of oral contraceptives who smoke. Am J Obstet Gynecol. 1999; 180(6 Pt 2): S349-56.