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Oral Contraceptives and Blood Pressure

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SUMMARY

To study the results of blood pressure in a group of Pakistani women taking oral contraceptive pills and compare them with age matched control. The study group comprised of fifty women (mean age 30.256±4.55 years) taking oral contraceptives for a period varying from 1-10 years. Control included fifty age matched women (mean age 30.85±4.33 years) using mechanical methods of contraception. Three consecutive blood pressure readings were taken and average of three readings was taken as basal blood pressure. Mean parity rate was 4.576±1.7 and 4.23±2.12 respectively in oral contraceptive and control. Group. The difference was non significant. The difference of mean ponderal index of the two groups was statistically non-significant. Mean systolic and diastolic blood pressure in oral contraceptive and control group was 116.255±10.65mmHg and 77.98±8.10 mmHg, 112.368±11.74mmHg and 74.58±7.39mmHg respectively, blood pressure was in the hypertensive range in 5 women, past history of toxaemia of pregnancy was present in 3 cases of contraceptive and 4 of control group. Urinary tract infection present in 2 and 4 women in the contraceptive and control groups respectively. Family history of diabetes mellitus was present in 9 cases of the control and 5 cases of the contraceptive group. It is suggested that oral contraceptive drugs should be used with particular care in females with higher parity, history of toxaemia of pregnancy, preexisting hypertension and family history of hypertension.'

INTRODUCTION

In the underdeveloped countries, there has been an increasing awareness about the consequences of rapid population growth and therefore family planning is placed high on the list of national priorities.[1] Since their introduction nearly 30 years ago, oral contraceptives have been widely researched regarding their effects (contraceptive, non-contraceptive). With proper usage, oral contraceptive provides highly effective contraception, and also confer significant, non-contraceptive health benefits.[2] It is well known that oral contraceptives change blood pressure by a few mmHg and causes a two to three fold increase in the incidence of hypertension. The association between oral contraceptives and raised blood pressure was established in various studies.[3,6] Weir et al (1974) in a prospective study on a group of normotensive women over a 4 years period showed a significant rise in systolic blood pressure after 1 years on oral contraceptives and significant rise in diastolic pressure at the end of 2 years. Discontinuation of oral contraceptives resulted in return of blood pressure to pretreatment levels within 3 months.[11]

Oral contraceptives (OC) usage increases serum angiotensinogen level to three to five times normal and about 5% of these women develop arterial hypertension.[4] Current use of OCs is associated with an increase risk of acute myocardial infarction among women with known cardiovascular risk factors and among those who have not been effectively screened particularly for blood pressue.[10]

History, physical examination and simple laboratory tests are sufficient to detect the main contraindication, i.e. arterial hypertension, a history of coronary or cerebrovascular condition, deep vein thrombosis, hypercholesterolemia exceeding 3 g/L hypertriglyceridaemia exceeding 3 g/L.[5]

In this paper we report the results of blood pressure study in a group of Pakistani women taking oral contraceptive pills and compare them with age matched controls.

SUBJECTS AND METHOD

The study group was drawn from females attending various family planning units of Lahore, and comprised of fifty women taking oral contraceptives for a period varying from 1-10 years. Control group included fifty age matched women using mechanical methods of contraception.

Blood pressure was recorded with a conventional mercury sphagmomanometer after the subject had been sitting at rest for 10 minutes.

Three consecutive readings at intervals of 10 minutes were taken and average of three readings was taken as basal blood pressure. All women had complete physical examination and in each case age, height and weight were recorded.

Other documentation included history of parity, renal disease, hypertension, family history of hypertension.

RESULTS

Table 1 showed comparison of various parameters in the oral contraceptive group and controls. Mean age of the oral contraceptive group was 30.256:±4.552 years and that of the control group 30.852:±4.332 years, the difference being non-significant.

Mean parity rate was 4.576:±1.700 and 4.236±2.123 respectively in oral contraceptive group and controls. Again the difference was non-significant similarly the difference of mean ponderal index [height (inches)/3 weight (lbs)] of the two groups was statistically non-significant.

Mean systolic blood pressure in women on oral contraceptive was 116.255:±10.653 mmHg and in the controls 112.368±11.742 mmHg being significantly higher in the oral contraceptive group. Mean diastolic blood pressure was 77.089±8.102 and 74.581±7.398mmHg in oral contraceptive and controls respectively and was significant ($p<0.01$) in the oral contraceptive group.

In the control group blood pressure was within normal range (upper limit: systolic 140, diastolic 90mmHg) in all women. However in the contraceptive group, blood pressure was in the hypertensive range in 5 women. All were in late thirties, they had family history of hypertension.

There was a significant correlation between ponderal index and systolic and diastolic biood pressure in each group (Table 2).

In the two groups, past history of toxaemia of pregnancy was present in 3 cases of contraceptive and 4 of control group and that of urinary tract infection in 2 and 4 women in the contraceptive and control groups respectively. Family history of diabetes mellitus was present in 9 cases of the control and 5 cases of the contraceptive group while that of hypertension was present in 5 cases in each group (Table 3).

DISCUSSION

Various studies carried out in England and United States have documented that certain women develop hypertension while taking oral contraceptives.[6]

The OC is a safe form of contraception for the majority of women. The challenge is to identify the women who have risk factors that make the use of OC less safe.[7] It has also been suggested that the oestrogen component of the contraceptive agent may contribute to the development of hypertension. Oestrogen infusions have been shown to raise the systolic blood pressure.[8]

In our series, blood pressure of women using OC for a variable period of time was compared with a group of women using mechanical contraceptive methods. BP values may be affected by factors such as age, weight, parity and genetic predisposition. No statistically significant difference was present between two groups with respect to mean age, mean parity rate and mean ponderal index. The relation of mean ponderal index to mean systolic and diastolic BP was equally significant in each group.

The frequency of various relevant features was approximately equally distributed in the two groups. Under these relatively controlled conditions results showed significantly higher levels of mean systolic and diastolic BP in OC group compared to using contraceptive methods other than drugs. Alternative method of contraception should be considered for hypertensive women in place of oral contraceptives.[9]

Pharmacists should be aware of the risk factors so that they can advise patients to see a

Table 1: **Mean values of ponderal index, systolic and diastolic blood pressure, age and parity in the oral contraceptive group and controls.**

Blood pressure and other parameters	Control group (n=50) (Mean±SD)	Treated group (n=50) (Mean±SD)	Statistical significant
Ponderal index	12.123±0.601	12.105±0.71	N.S.
Diastolic blood pressure (mmHg)	74.58±7.98	77.089±8.102	S
Systolic blood pressure	112.36±11.74	116.255±10.65	S
Age (Years)	13.852±4.332	30.256±4.552	N.S.
Parity	4.236±2.1123	4.576±1.70	N.S.

Table 2: **Results of the correlation between the blood pressure and ponderal index of the 50 females taking oral contraceptives and of control group with same number.**

Study of relationship in the variable	Control Group		Treatment Group	
	Correlation	Statistical significant	Correlation	Statistical significant
Ponderal index with diastolic BP	r = -0.2495	P<0.01	r = -0.3092	P<0.001
Ponderal index with systolic BP	r = -0.3041	P<0.01	r = 0.2840	P<0.001

Table 3: **Relevant clinical features in women on oral contraceptives and control.**

Clinical features	Oral contraceptive group	Control group
Family history		
Hypertension	5	5
Diabetes mellitus	5	9
Pasty History		
Toxaemia of pregnancy	3	4
Urinary tract infection	2	4

doctor if new health problem arise between visits.

The results of our study are suggestive of a small but significant rise of BP in females taking OC. With practical point of view, these drugs should be used with particular care in women with older age group, history of toxaemia of pregnancy, Pre-existing hypertension and family history of hypertension.

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