

STUDY OF BLOOD PRESSURE IN WOMEN TAKING ORAL CONTRACEPTIVES

Pages with reference to book, From 157 To 159

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Abstract

Blood pressure was recorded in 106 females taking oral contraceptives for a variable period and compared with 106 age matched controls using other methods of contraception. The mean systolic and diastolic blood pressure were significantly higher in women taking oral contraceptives. A significant correlation of ponderal index with systolic and diastolic blood pressures was present in each group. It is suggested that these drugs should be used with particular care in females with higher parity, history of toxemia of pregnancy, preexisting hypertension and family history of hypertension (JPMA 30:157, 1980).

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. Oral contraceptives (O.C.) being a convenient form of fertility control, have become a popular mode of prophylaxis and are widely used by a large section of apparently healthy female population. However, long term use of these drugs has been found to be associated with certain possible side effects; one of them being rise in blood pressure (B.P.) from mild to hypertensive ranges (Woods, 1967; Wein-berger et al., 1969). It is also conceivable that the effects produced following the use of these agents may vary in people of different ethnic groups.

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

Material and Methods

The study group was drawn from females attending the Family Planning Unit of Ganga Ram Hospital and comprised of 106 women taking oral contraceptives (Norinyl or Ovral) for a period varying from 5-12 years. Control group included 106 age matched women using mechanical methods of contraception.

Blood pressure was recorded with a conventional mercury sphygmomanometer 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, weight and height were recorded.

Other documentations included history of parity, renal disease, hypertension before the use of pills, toxemia of pregnancy and family history of hypertension.

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Results

Table I: Mean Values of Ponderal Index, Systolic and Diastolic Blood Pressure, Age and Parity in the Oral Contraceptive Group and Controls

<i>Blood Pressure and other parameters</i>	<i>Control Group (n=106)</i>		<i>Treatment Group (n=106)</i>		<i>Statistical significance</i>
	<i>Mean ± St.D.</i>	<i>Mean ± St.D.</i>	<i>Mean ± St.D.</i>	<i>Mean ± St.D.</i>	
Ponderal Index	12.332 ± 0.6091	12.105 ± 0.8103	N.S.		
Diastolic Blood Pressure (mm of Hg)	74.481 ± 7.398	77.009 ± 8.212	(0.02 > P > 0.1)		significant
Systolic Blood Pressure (mm of Hg)	113.368 ± 11.742	117.225 ± 14.653	(0.05 > P > 0.02)		significant
Age (years)	30.925 ± 4.885	30.858 ± 4.772	N.S.		
Parity	4.896 ± 2.236	4.679 ± 1.810	N.S.		

N.S.—Not significant.

Table I shows comparison of various parameters in the oral contraceptive group and controls. Mean age of the oral contraceptive group was 30.858 ± 4.772 years and that of the control group 30.925 ± 4.885 years, the difference being non-significant.

Mean parity rate was 4.679 ± 1.810 and 4.896 ± 2.236 respectively in oral contraceptive groups and controls. Again the difference was not significant. Similarly the difference of mean ponderal index (Height (inches)/3√Weight (lbs)) of the two groups was statistically nonsignificant.

Mean systolic blood pressure in women on oral contraceptive was 117.225 ± 14.653 mm of Hg and in the controls 113.368 ± 11.742 mm of Hg being significantly higher (0.05 > P > 0.02) in the oral contraceptive group. Mean diastolic B.P. was 77.009 ± 8.212 and 74.481 ± 7.398 mm of Hg in oral contraceptive group and controls respectively and was significantly higher (0.02 > P > 0.01) in the oral contraceptive group. In the control group B.P. was within normal range (upper limit: systolic 140, diastolic 90 mm of Hg) in all women. However, in the contraceptive group B.P. was in the hypertensive range (systolic 140; diastolic 90 mm of Hg) in 4 women. These 4 women were in their late thirties; of these one had a family history of hypertension, diabetes mellitus with past history of toxemia of pregnancy and urinary tract infection. The other subject had a history of raised blood pressure before taking contraceptive pills.

There was a significant correlation between ponderal index and systolic and diastolic blood pressures in each group (Table II).

Table II: Results of the Correlation Between the B.P. and Ponderal Index of the 106 Females taking Oral Contraceptives and of Control Group with same Number

<i>Study of relationship in the variables</i>	<i>Control Group</i>		<i>Treatment Group</i>	
	<i>Correlation</i>	<i>Statistical significance</i>	<i>Correlation</i>	<i>Statistical significance</i>
Ponderal index with diastolic B.P.	r=-0.2395	(0.02>P>0.01) significant	r=-0.3192	P<0.001 significant
Ponderal index with systolic B.P.	r=-0.3140	(0.01>P>0.001) significant	r=-0.2940	(0.01>P>0.001) significant

r=relationship in inverse.

In the two groups, past history of toxæmia of pregnancy was present in 4 cases of contraceptive and 5 of control group and that of urinary tract infection in 2 and 3 women in the contraceptive and control groups respectively. Family history of diabetes mellitus was present in 11 cases of the control and 6 cases of the contraceptive group while that of hypertension was present in 7 cases in each group (Table III).

Table III: Relevant Clinical Features in Women on Oral Contraceptives and Control

<i>Clinical features</i>	<i>Oral contraceptive group</i>	<i>Control group</i>
A. Family history:		
(a) Hypertension	7	7
(b) Diabetes mellitus	6	11
B. Past history:		
1. Toxaemia of pregnancy	4	5
2. Urinary tract infection	2	3

Discussion

Various studies carried out in England and United States have documented that certain women develop hypertension while taking oral contraceptives (Tyson, 1968; Clezy et al., 1972). Weir et al (1971, 1974) in a prospective study on normotensive women showed a significant rise in systolic and diastolic blood pressure after the use of oral contraceptives, which, on discontinuation of the drug returned to pre-treatment levels. Also there have been some reports of severe reversible hypertension in women taking oral contraceptives (Woods, 1967; Weinberger et al., 1969). Occasional case of malignant hypertension associated with the use of oral contraceptives has also been documented (Dunn et al., 1975).

In our series B.P. of women using O.C. for a variable period of time was compared with a group of women using mechanical contraceptive methods. B.P. values may be affected by factors such as age, weight, parity and genetic predisposition. No statistically significant difference was present between the 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 B.P. was equally significant in each group. The frequency of various relevant features such as family history of hypertension, history of toxemia of pregnancy etc., was approximately equally distributed in the two groups. Under these relatively controlled conditions results show significantly higher levels of mean systolic and diastolic B.P. in the O.C. group compared to subjects using contraceptive methods other than drugs. Older women of higher weight and parity and those with history of toxemia of pregnancy are more prone to the hypertensive effects of contraceptive pills (Mason et al., 1973). In this series B.P. was within normal limits in each of the women of control group but in 4 women in the oral contraceptive group it was in the hypertensive range. In 3 of these 4, there was history suggestive of some predisposing factor such as pre-existing hypertension, toxemia of pregnancy or high parity rate.

The results of our study are suggestive of a small but significant rise of B.P. in females taking oral contraceptives. From practical point of view, these drugs should be used with particular care in women with older age group, history of toxemia of pregnancy, pre-existing hypertension and family history of hypertension.

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References

1. Clezy, T.M., Foy, B.N., Hodge, R.L. and Lumbers, E.R. (1972) Oral contraceptives and hypertension. An epidemiological survey. *Brit. Heart J.*, 34:1238.
2. Dunn, F.G., Jones, J.V. and Fife, R. (1975) Malignant hypertension associated with use of contraceptives. *Brit. Heart J.*, 37:336.
3. Mason, B., Oakly, N., Wynn, V. (1973) Studies of carbohydrate and lipid metabolism in women developing hypertension on oral contraceptives. *Brit. Med. J.*, 3:317.
4. Tyson, J.E.A. (1968) Oral contraception and elevated blood pressure. *Am. J. Obstet. Gynaecol.*, 100:785.
5. Weinberger, M.H., Collins, R.D., Dowdy, A.J., Nokes, G.W. and Luetscher, J.A. (1969) Hypertension induced by oral contraceptives containing estrogen and gestagen. Effects on plasma renin activity and aldosterone excretion. *Ann. Intern. Med.*, 71:891.
6. Weir, R.J., Briggs, E., Mark, A., Naismith, L., Taylor, L. and Wilson, E. (1971) Blood pressure in women after one year of oral contraception. *Lancet*, 1:467.
7. Weir, R.J., Briggs, E., Mack, A., Naismith, L., Taylor, L. and Wilson, E. (1974) Blood pressure in

women taking oral contraceptives. *Brit. Med. J.*, 1:153.

8. Woods, J.W. (1967) Oral contraceptives and hypertension. *Lancet*, 2:653.