Study of Blood Pressure in Women Taking Oral Contraceptives

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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 toxaemia 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; Weinberger 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 6-12 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, toxaemia of pregnancy and family history of hypertension.

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Results

<table>
<thead>
<tr>
<th>Blood Pressure and other parameters</th>
<th>Control Group (n=106)</th>
<th>Treatment Group (n=106)</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ponderal Index</td>
<td>12.332±0.6091</td>
<td>12.105±0.8103</td>
<td>N.S.</td>
</tr>
<tr>
<td>Diastolic Blood Pressure (mm of Hg)</td>
<td>74.481±7.398</td>
<td>77.009±8.212</td>
<td>(0.02&gt;P&gt;0.1) significant</td>
</tr>
<tr>
<td>Systolic Blood Pressure (mm of Hg)</td>
<td>113.368±11.742</td>
<td>117.225±14.653</td>
<td>(0.05&gt;P&gt;0.02) significant</td>
</tr>
<tr>
<td>Age (years)</td>
<td>4.925±0.885</td>
<td>4.896±2.236</td>
<td>N.S.</td>
</tr>
<tr>
<td>Parity</td>
<td>4.896±2.236</td>
<td>4.679±1.810</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

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\sqrt{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±7.398mm 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 toxaemia 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).
In the two groups, past history of toxaemia 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).

In the two groups, past history of toxaemia 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).

**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 toxaemia 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 toxaemia 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, toxaemia 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 toxaemia of pregnancy, pre-existing hypertension and family history of hypertension.

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References