

## BLOOD-PRESSURE READINGS IN 1000 PREGNANT WOMEN

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**T**HIS study of the blood pressure in 1000 pregnant cases was made because it was believed that the readings given in various text-books and in the literature were somewhat too high.

In choosing these patients for study the following postulations were laid down:

First.—The patient must have been under care at least one month before delivery, so that several blood-pressure readings could be taken.

Second.—The patient must have been delivered of a viable child or, if she was delivered of a stillborn fetus, it must have been at least seven months old. This ruled out all abortion cases.

Third.—The cases must be consecutive.

The blood pressure readings have been made by the auscultatory method with a mercury sphygmomanometer of standard make; occasionally they have been made with an aneroid machine. They have been taken either by me, the medical assistant, or by the nurse, the last named being well trained in taking the readings. I, personally, confirmed the reading in any doubtful case. The readings were made in the majority of instances with the patient in a sitting posture with the arm resting on the table. The highest was used wherever more than one reading appeared in a month.

Two diastolic readings are given, the first being the point at which the character of the sound changes to a lower pitch (fourth phase) and the second where the sound entirely disappears (fifth phase). The second reading is more reliable than the first except in some heart cases where the sound does not disappear entirely. The personal equation in distinguishing variations in intensity and in pitch of sounds is greater than that of determining the point where the sound disappears. Both readings have been taken in a great many cases and the graphs show that there is a parallel change in the two readings in the various months. The difference on the average is close to six points. Since this reading parallels the other more difficult reading to take and since it increases the pulse pressure but little, I have of late stopped recording the first diastolic reading.

In order to study the blood pressure in pregnant women more carefully all cases have been divided into three groups: First, those with blood pressures up to 129 (584 cases); second, those between 130 and 139 (240 cases); and third, those with blood pressures over 140 (176 cases). Any patient showing a reading one or more times above 129, was placed in one of the last two groups. I believe that this grouping

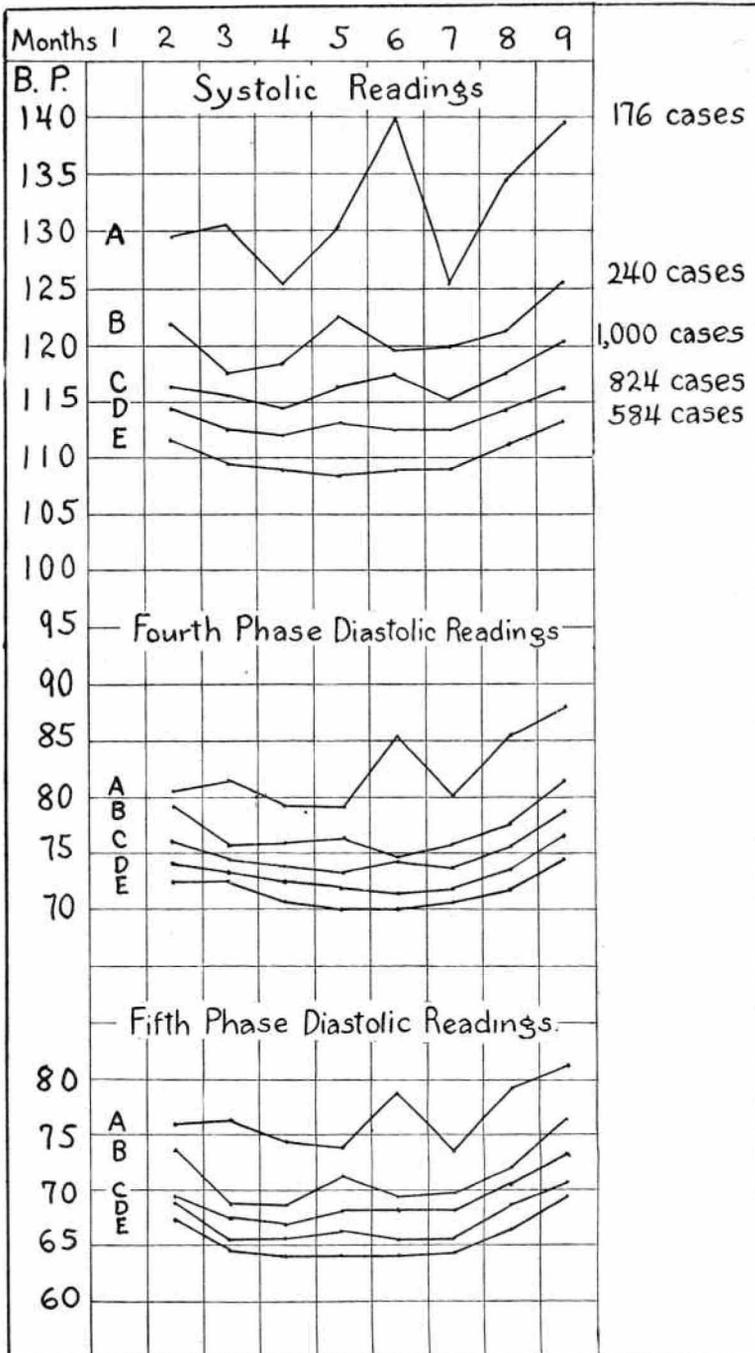


Fig. 1.—The graph represents the readings taken during the various months of pregnancy. The letters on the left indicate the corresponding graphs. The systolic and diastolic readings conform, i.e., when the systolic blood pressure increases or decreases, the diastolic conforms.

Faught states that "individuals not infrequently show marked abnormal variations in the systolic pressure, the occurrence of which does not necessarily indicate impending grave metabolic disturbance or toxic states." This is true only if the variation is not persistent.

In the group with systolic readings below 129 there were 27 cases with a systolic reading of 100 or less throughout pregnancy. One patient whose systolic reading never went above 90 gave one reading of 76-60-54. In none of these patients was there any sign whatever of shock during or after labor. One patient delivered in the seventh month. Lynch and Schulze have warned against shock in low blood pressure cases. I have endeavored to combat the hypotension in these patients by the use of digitalis, diet, rest and graduated exercise, but I have failed in most instances to change the readings much. A few patients have been placed under the direction of internists with the same result. Roig, on the other hand, claims good results with digitalis. I have noticed that the blood pressure readings in the first three months of pregnancy are usually very low in many of those who suffer with more or less continuous nausea and vomiting. As a rule it rapidly rises as soon as the patient begins to feel better and to eat.

Ten years ago Roig stated that the readings in normal women and normal pregnant women were the same, i.e., 90 to 110. This is not in accord with my findings, only 0.27 per cent of the patients having a blood pressure of 100 or less.

In the discussion of Faught's paper, Norris said that 80 per cent of the women showed a blood pressure 100-130, the larger number being nearer 100. I found that 58.4 per cent had a blood pressure of 129 or less.

In 1925 Simons and Rassmussen stated that the blood pressure in the second month averaged 107.1 and gradually increased to 119 in the ninth month. They also stated that it decreased in the fifth and sixth months. A study of my graph shows a high blood pressure in the second month, ranging from 111.467 in cases with systolic pressures below 129 to 116.453 for all cases. In the former group the decrease was noted from the third to the fifth months, the lowest being in the fifth month, 108.744. When all cases are included in the average, the drop is noted only in the third and fourth months. It will be noted that there is a drop of only one point for each month. In all groups there is a gradual rise in blood pressure beginning at the seventh month and reaching its maximum at the ninth month. In the group below 129 systolic the difference between the maximum is only 4.4 while in the group 140 plus it is nearly 15.

I believed that there might be a difference in the tendency of the multiparous woman to develop an increase in blood pressure over the primiparous. This is tabulated herewith.

The percentage of multipara (62.5 per cent) in the 140 group is higher than any of the other groups. If we include all cases with blood pressures of 130, the percentage is slightly lower (55.77 per cent). If all cases are included, the percentage of multiparae is 56.1 per cent.

## SUMMARY

1. The blood pressure readings in one thousand consecutive pregnant cases have been studied.
2. The patients have been divided into 3 groups:
  - A, those with systolic pressure below 129,
  - B, those between 130 and 139, and
  - C, those above 140.
3. In Group A the blood pressure throughout pregnancy is lower than in normal nonpregnant women. There is practically no change in the average readings from one month to another, the minimum being 108.744 and the maximum 113.148.
4. In Group B appear the potentially toxic cases. These patients demand more attention than is usually given them, since a certain percentage will prove to be toxic.
5. In Group C are seen the toxic patients. In the series studied there was no case of eclampsia.
6. There is only an average difference of 6 points in the diastolic readings taken in the fourth and fifth phases. The latter reading is more accurate and should therefore replace the fourth phase reading in recording the diastolic pressure.
7. The average readings in all cases have been somewhat lower than is usually recorded. This is not an accurate gauge since a rather high percentage of patients have a blood pressure of 140 +.

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