

CERTAIN ASPECTS IN THE APPROACH TO HYPERTENSION IN PREGNANCY*

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Platt¹ stated: 'Hypertension is something like obesity, something in which there are no limits, and where you cannot point to people and say, these are normal and those are abnormal.' For the obstetrician a clear concept of what is to be considered as normal blood pressure in pregnancy is imperative because of the dangers that even minimal abnormalities may entail for the mother and her baby. Is the generally recognized upper limit of 140/90 mm. Hg on 2 or more occasions acceptable to us as the level whereby all patients can be assessed to be hypertensive or not? Can we, with only this as basis, predict whether the complications of hypertension in pregnancy will ensue or not? If not, then the approach to this, the most acute problem in modern obstetrics, will have to be reconsidered. There are many authorities who for a long time have doubted whether blood pressure readings lower than 140/90 mm. Hg ought not to be regarded as significant of hypertension. For 30 years F. J. Browne^{2, 3} has taught that any elevation of the blood pressure above 120 mm. Hg systolic and/or 80 mm. Hg diastolic should be regarded as suspicious, and transient rises in the systolic, diastolic or both readings, even in response to excitement, should be regarded as significant. These patients he classified as the 'labile' blood-pressure

group. Morris and McClure Browne⁴ consider these 'no-man's-land' cases as the troublesome and unpredictable ones; they found that 39% of them ultimately develop pre-eclamptic toxæmia.

The evaluation of hypertension in a pregnant patient may be of great importance since treatment hinges upon the assessment. There are many factors that may influence blood-pressure readings. The importance to be attached to them varies considerably; it often seems to be clouded by personal bias. The reasons for this unsatisfactory state of affairs may be briefly enumerated as follows:

1. *The duration of pregnancy.* Reid and Teel⁵ and Chesley and Anntto⁶ showed that the majority of hypertensives, like normotensives, have a drop in blood pressure at mid-pregnancy. Difficulty may be encountered when a patient is seen for the first time in the middle trimester of pregnancy. She may present with a normal blood pressure, whereas this mid-pregnancy drop may be masking a higher blood-pressure level.
2. *Individual variability* from day to day and hour to hour, and in response to excitement. This must influence a number of blood-pressure readings, perhaps especially in pregnant women.
3. *The range in the circumference of the arm.* This may be as great as 15-50 cm., caused either by fat or oedema. Fraser Roberts⁷ found a rise in blood-pressure readings of 5 mm.

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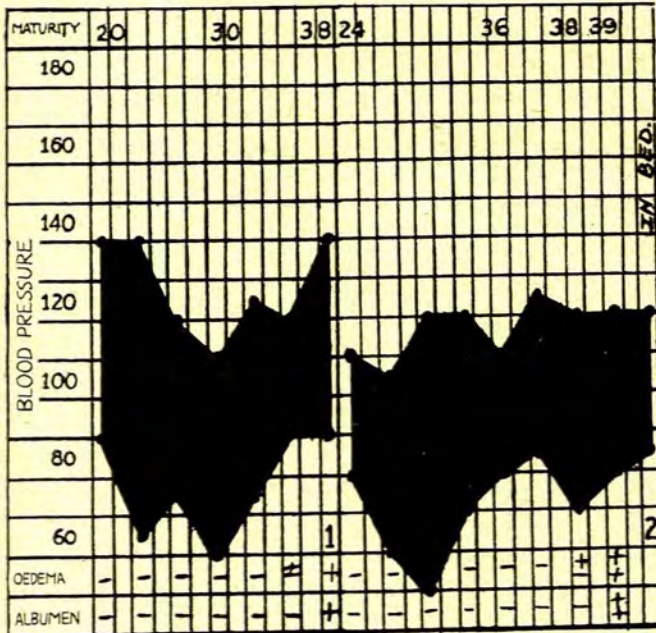


Fig. 1. Between the 28th and the 32nd weeks this patient's blood pressure was completely normal. The ultimate development of hypertension+proteinuria and oedema could only have been expected if the hypertensive blood pressure reading at the 20th week was known.
Fig. 2. Although this patient's blood pressure readings stayed within the recognized normal limits of 140/90-mm. Hg, she developed eclampsia while in bed and well sedated.

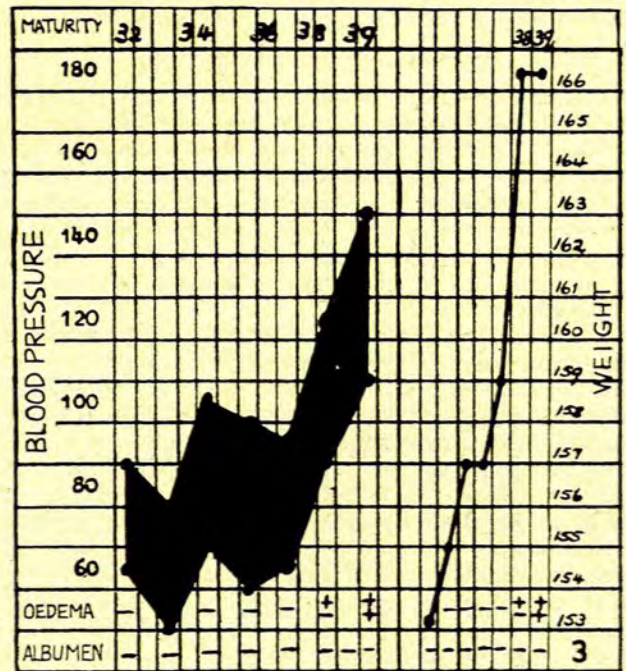


Fig. 3. The sudden rise in blood pressure from 95/55 mm. Hg at 37 weeks to 125/90 at 38 weeks should have been the warning sign, especially as it was associated with a marked increase in weight. At the 39th week she was truly hypertensive and was admitted with a mixed type of accidental haemorrhage.

Hg systolic and 3 mm. Hg diastolic per 4 cm. increase in arm circumference.

4. *The taking and interpreting of the blood pressure* may vary in different observers. The diastolic pressure may be recorded as the reading at which there is a change in the sounds, or when the sounds disappear. This readily accounts for a difference of 5-10 mm. Hg or more.

5. *A low blood pressure at the beginning of pregnancy.* What is the significance of a rise of the blood pressure during pregnancy from an initially normal or low reading to one still within the recognized upper limit of 140/90 mm. Hg? Should a pregnant woman who at the beginning of pregnancy has a blood pressure of 110/60 mm. Hg and at 38 weeks one of 135/85 not be considered as much hypertensive as the patient who has a blood pressure rise from 125/75 to 150/100? In each case the rise is 25 mm. systolic and 25 mm. diastolic. One is tempted to regard the findings in the first group as significant, for experience shows that many patients in this group will probably develop severe complications of hypertension, especially when the rise is a rapid one. It is sometimes associated with other signs of toxæmia such as oedema or proteinuria.

6. Difficulty is experienced in pinning a diagnostic label to the patient who has a blood pressure of 135/80 mm. Hg, with or without oedema, and no proteinuria or only a trace, who after 6-12 hours of labour shows a rise in blood pressure to 160/110 mm. Hg and an increase in proteinuria. When did she become hypertensive?

The obvious conclusion is that there is no blood-pressure level at which all patients can be diagnosed as being hypertensive. No sure prediction can be made whether a patient

will be prone to the complications of hypertension. Each case, therefore, must be assessed on its own merits. The significance attached to variations must be determined by associated findings, viz.: (1) age and parity, (2) history of previous hypertensive episodes, (3) the rise in blood pressure and the rapidity with which it occurred, from the pre-pregnancy or early pregnancy state, and (4) the presence of associated signs of oedema and/or proteinuria.

USE OF HYPOTENSIVE DRUGS

An analysis of what happened to the hypertensives (the standard of hypertension being a blood pressure of 140/90 mm.

TABLE I. HYPERTENSIVES ADMITTED IN 1957 AND 1958

Number of patients admitted	14,834
Incidence of hypertension	11.2%
Incidence of eclampsia in hypertensives	4.1%
Incidence of accidental haemorrhage in hypertensives	8%
Foetal loss in hypertensives (with and without proteinuria)	12.4%
Of the maternal deaths 46.6% were due to hypertensive (+ proteinuria) complications.		

Hg or more) in our unit during the years 1957 and 1958 is shown in Table I. These figures emphasize that hypertension and its associated complications constitute the major problems in modern obstetrics.

In view of these facts and the acute shortage of antenatal beds, a new approach to the management of hypertensives was (and still is) being tried in our unit, viz. the use of certain hypotensive drugs. The aims are obvious:

1. To treat as many of these patients as out-patients as is possible. Not only would this ease the antenatal bed position but would relieve the domestic, social and economic problems of the patient, brought about by long sojourn in hospital.
2. To prevent the development of proteinuria and oedema.

3. Should oedema or proteinuria have developed, it was hoped to reverse the condition or at least to tide the patient over to possible viability of the foetus; that is to say, to obviate prematurity with its high foetal mortality.

The drugs used were mevasine in combination with chlortride, and serpasil in a few cases. The routine followed was as follows:

1. An assessment was made whether the patient was suitable for treatment. Advanced retinopathy, severe albuminuria and cardiac failure (associated with hypertension) were regarded as contra-indications for continuation of pregnancy.

2. In the cases regarded as suitable for treatment, the minimum dose of 2.5 mg. of mevasine t.d.s. and 1,000 mg. of chlortride on alternate days was given to the patient, either in hospital or as an out-patient, according to the severity of the hypertension and the presence of associated toxæmic signs. The dose of mevasine was gradually increased if necessary, but the maximum of 10 mg. t.d.s. was never exceeded. If the blood pressure was still not controlled, serpasil was added to the treatment, either parentally (1 mg. every 3-4 hours) or orally (0.25 mg. 3 or 4 times a day). No response to treatment was taken as an indication for termination of the pregnancy.

3. If at all possible, mevasine treatment was stopped 3-4 days before any contemplated operative procedures, in view of the dangers of paralytic ileus in the mother or child.

4. During mevasine treatment, laxatives were given regu-

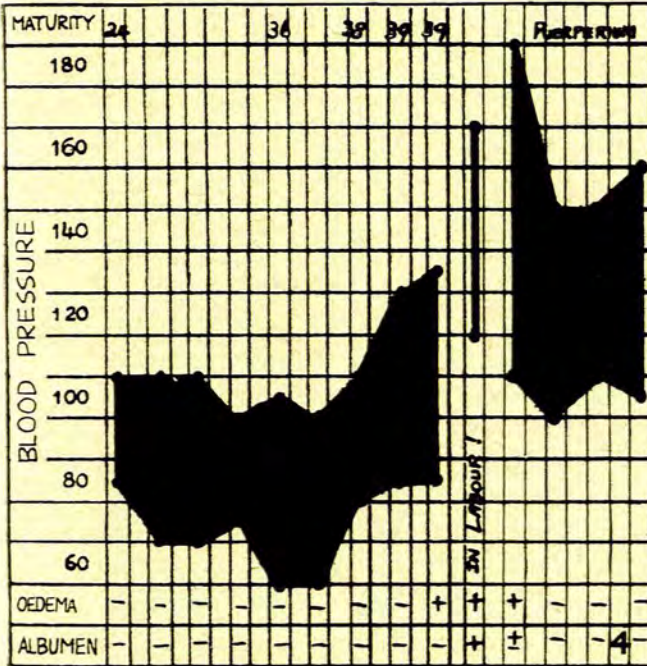


Fig. 4. The day before admission, this patient's blood pressure was 135/85 mm. Hg with slight oedema present. Not only in labour did her blood pressure rise to 170/120 but in the puerperium she stayed hypertensive and had to be sedated heavily.

larly because of the severe constipation that is often found in association with the administration of this drug.

The results of this treatment in 169 cases are shown in Tables II, III and IV, with comments. Figs. 5 and 6 show the response of two of the patients treated.

TABLE II. TREATED HYPERTENSIVES: BEFORE 28 WEEKS

	Severer Group 160/100+	Mild and Moderate Group
No. of patients	25	40
Maternal mortality	0	0
Foetal loss: Abortions	4	1
Hysterotomies	2	0
Stillbirths	2	0
Neonatal deaths	2	2
No. of eclamptics	0	0
No. of accidental haemorrhages	2 = 8%	0
No. who developed proteinuria	6 = 24%	5 = 12.5%
Average weight of babies	5 lb. 6 oz.	7 lb. 4 oz.
Average stay in hospital	19½ days	8½ days

(a) The foetal loss of 38.5% is still very high in the severe hypertensives, although it should be noted that most of these patients were originally referred for termination of pregnancy. That of 7.5% in the mild and moderately severe hypertensives compares favourably with results claimed by workers like Taylor, Tillman and Blanchard.⁹

(b) Proteinuria developed in twice as many cases in the severer hypertensives as in the mild and moderate ones.

(c) The average weight of the babies in the severer group is much less than in the mild and moderate group despite the fact that the average stay in hospital is twice as long in the former.

(d) The incidence of accidental haemorrhage (8% in the severer group) is not decreased by hypotensive drug therapy.

TABLE III. TREATED HYPERTENSIVES: AFTER 28 WEEKS

	Hypertensive only	Hypertension + Proteinuria
No. of patients	22	52
Maternal mortality	0	1 = 1.9%
Foetal loss: Stillbirths	0	4
Neonatal deaths	0	2
No. of eclamptics	0	1 = 1.9%
No. of accidental haemorrhages	0	4 = 7.6%
Average weight of babies	7 lb. 2 oz.	7 lb.
Average stay in hospital	6 days	13 days

(a) It is obvious that the uncomplicated hypertension in pregnancy offers no great hazards to mother and child, but once proteinuria develops the outlook for both deteriorates.

(b) Again the incidence of accidental haemorrhage is 7.5%.

TABLE IV. TREATED 'NO-MAN'S-LAND' CASES ('LABILE' BLOOD-PRESSURE GROUP)

No. of patients	30
No. who developed hypertension	2 = 6.6%
No. who developed hypertension + proteinuria	3 = 10%
Maternal mortality	0
Foetal mortality	0
Average weight of babies	7 lb. 12 oz.
Average stay in hospital	6½ days

This series of cases is too small for any conclusions to be drawn from it, but it is perhaps with timely treatment in this group that the real value of hypotensive and diuretic treatment will be found. Further statistics will be published later.

PROGNOSIS

An important aspect to be considered is the prognosis of patients with hypertension in whom pregnancy has been allowed to continue. Our own hypertensive follow-up clinic was only started 1½ years ago and no analysis can as yet be made. Gladys Dodds¹⁰ followed up hypertensives in subsequent pregnancies and came to the following conclusions:

(a) In patients who were over 30 years of age when the

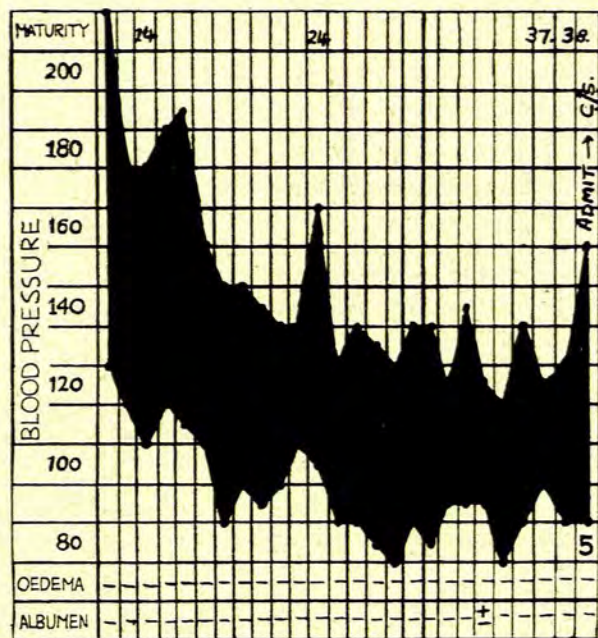


Fig. 5. This patient had a hysterotomy performed for hypertension in 1955 and a therapeutic abortion in 1957. As a known hypertensive she was referred to the gynaecological out-patients department in 1958 for termination of pregnancy and sterilization. After an initial admission to hospital for 5 days so that she could be fully investigated and treatment commenced, she was treated as an out-patient until she was admitted for Caesarean section. The weight of her baby was 5 lb. 13 oz. Both mother and baby were discharged fit after 10 days in hospital. At a subsequent visit at the hypertensive follow-up clinic her blood-pressure reading was 180/110 mm. Hg. She had been off treatment since the birth of her baby.

hypertension in pregnancy first manifested itself, an exacerbation of the hypertension in subsequent pregnancies was more likely to occur, proteinuria developed more frequently, and the foetal loss was increased.

(b) Marked increase in the hypertension *did not* occur within the first 5 years. The hypertensive should therefore have her next baby as soon as possible.

(c) The higher the initial blood pressure with the previous pregnancy, the greater the risk of exacerbation of the hypertension and the development of proteinuria.

For the remote prognosis, it is best to refer to the results of the following workers:

1. F. J. Browne,¹¹ who stated that:

(a) 20-50% of hypertensives during pregnancy will develop chronic hypertension, depending upon whether the normal blood-pressure reading is taken to be 140/90 or 120/80 mm. Hg, whether there is a family history of hypertension, and the length of time that the hypertension lasted before delivery of the baby.

(b) Pre-eclamptic toxæmia will supervene in 20% of hypertensives.

(c) Chronic nephritis, if it ever occurs, must be an exceedingly rare sequel of pre-eclamptic toxæmia.

2. Poul Bechgaard, Andreassen and Hertel,¹² who, in following up 383 hypertensives for a 10-20 year period, found that:

(a) 57% of hypertensives during pregnancy were severely

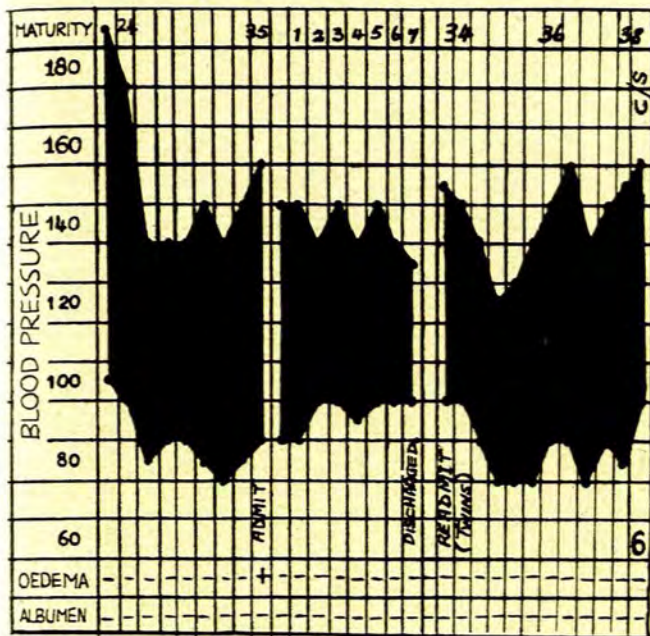


Fig. 6. This patient was a known hypertensive for years and was under constant treatment. She had no live children, despite this being her 3rd pregnancy. Her first pregnancy was of twins. Both children died neonatally as prematures, labour having been brought on for hypertension and proteinuria. In this last pregnancy her first admission to hospital was necessitated by the rise in blood pressure and the presence of oedema. The second admission was for the necessary rest when a twin pregnancy was diagnosed. At 38 weeks a Caesarean section was performed. Both babies were alive and were discharged after a 3 weeks' stay in hospital. The mother made an uneventful recovery. At a subsequent visit at the hypertensive follow-up clinic her blood-pressure reading was 190/115 mm. Hg. She had been off treatment since the birth of her babies.

hypertensive after the age of 45 years. In a control series of normotensives 21% became severely hypertensive. Before 45 years only 18% were severely hypertensive.

(b) Cardiovascular disease developed in 27% of hypertensives, renal disease in 2%.

(c) The mortality amongst those who were hypertensives because of pre-eclamptic toxæmia was much higher than amongst the essential hypertensives. The general health of the former was also much poorer.

CONCLUSIONS

1. The assessment of a pregnant patient for the condition of hypertension cannot be based on a blood-pressure level of 140/90 mm. Hg alone, but should be governed by many other factors.

2. Hypotensive drug therapy has a practical value in the treatment of hypertension in pregnancy. These patients can be treated as out-patients, with only the minimal stay in hospital. It also offers hope to some of the unfortunate women with severe hypertension and no live children.

3. The pregnancy associated with uncomplicated hypertension of the mild and moderately severe types does not constitute a severe obstetrical hazard. Even the more severe hypertensives can be controlled well enough not to endanger the life of the mother unduly, although the foetal loss is very high and the incidence of accidental haemorrhage is still about 8%.

4. Once proteinuria is superimposed, the mother's life is more endangered and the outlook for the baby deteriorates.

SAMEVATTING

Die begrip van wat met hipertensie gedurende swangerskap bedoel word is deeglik bespreek, en daar is tot die gevolgtrekking gekom dat die algemeen aanvaarde bloeddruklesing van 140/90 mm. Hg as basis om hipertensie te diagnoseer nie voldoende is nie. Ander faktore moet ook in ag geneem word.

Die waarde van hipotensiewe behandeling met mevasine, chlortride en serpasil in 169 gevalle is nagegaan, en die resultate behaal, uiteengesit.

I wish to express my thanks to Professor James T. Louw, Head of the Department of Obstetrics and Gynaecology, University of Cape Town, for his constant encouragement and helpful criticism, and the Superintendents of the hospitals concerned for permitting the analysis of these cases.

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