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ORIGINAL ARTICLES

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## A Prospective Study of Hypertension in Pregnancy at Harare Maternity Hospital

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### SUMMARY

Hypertension in pregnancy was found in six per cent of patients during a one-month study within the Greater Harare Obstetric Unit. Pre-eclampsia was the most common type of hypertension present in 72 (33,6%) patients. The epidemiological characteristics of the patients with different forms of hypertension in pregnancy are presented.

The perinatal mortality for hypertensive patients was 79,4/1 000 compared to 26,2 /1 000 in normotensive patients. Patients with pregnancy-induced hypertension had the lowest perinatal mortality at 18,2/1 000. Proteinuric hypertension was associated with an increased perinatal mortality, the worst prognosis being in patients with chronic hypertension with superimposed pre-eclampsia. The percentage of patients with proteinuria increased as the maximal level of diastolic blood pressure increased.

The findings are discussed with reference to the literature.

### INTRODUCTION

Pregnancy complicated by hypertension is associated with increased risks of mortality and morbidity for mother and child. Recent figures for England and Wales show that 12,8 per cent of all maternal deaths<sup>1</sup> and an estimated 8 per cent of all perinatal deaths<sup>2</sup> are attributable to hypertensive disease.

In 1983 hypertensive disease accounted for 15,7 per cent of maternal deaths<sup>3</sup> and 5,4 per cent of all the perinatal deaths within the Greater Harare Obstetric Unit.<sup>4</sup>

The aims of this study were, therefore, to determine the incidence of hypertension in

pregnancy in the Harare area, to document the epidemiological characteristics of hypertensive patients, and to determine the effects of different forms of hypertension on pregnancy outcome.

### PATIENTS AND METHODS

Harare Maternity Hospital is a referral centre for the high obstetric-risk patient. The majority of patients are referred from the maternity units run by the Municipality. Harare Maternity Hospital and the municipal clinics together form the Greater Harare Obstetric Unit (GHO). All patients within the GHO presenting with hypertension in pregnancy, with or without proteinuria, should be referred to Harare Maternity Hospital for assessment.

All patients with a systolic blood pressure of  $\geq 140$  mm Hg or a diastolic blood pressure of  $\geq 90$  mm Hg on two occasions, six hours apart, presenting to Harare Maternity Hospital in the period 1-31 October 1984 were entered into the study. Data collected included the age, parity, height and weight of the patient. The gestational age at onset of the hypertension and proteinuria, the maximal diastolic blood pressure and proteinuria, and the postnatal clinic blood pressure was recorded. The gestational age at delivery, mode of delivery, birth weight of the infant, and perinatal outcome were also noted.

Any patient who failed to attend the postnatal clinic was encouraged to attend by letter request, financial incentive and, if all else failed, a visit to her at home.

The results are compared to data from the GHO obstetric population using data derived from the use of the minimum basic data set.<sup>5</sup> Statistical analysis was by  $\chi^2$  test, and standard error of the difference between means.

### DEFINITIONS

Patients were assigned to one of the following five groups of hypertensive disorders in pregnancy:

1. Pregnancy-induced Hypertension (PIH): A blood pressure of  $\geq 140/90$  mm Hg or greater after

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the twentieth week of gestation in a patient who was previously normotensive or who was normotensive at the postnatal clinic visit six weeks after delivery.

2. Pre-eclampsia (PE): Development of significant proteinuria in a patient with pregnancy-induced hypertension ( $\geq 0,3$  g/L).

3. Chronic Hypertension (CH): Presence of persistent hypertension  $\geq 140/90$  mm Hg of whatever cause before pregnancy, or at the twentieth week of gestation or before, or persistent hypertension at the postnatal clinic visit six weeks after delivery.

4. Chronic Hypertension with Superimposed Pre-eclampsia (CHSIPE): Development of significant proteinuria in a patient with chronic hypertension ( $\geq 0,3$  g/L).

5. Unclassified Hypertension (UH): Hypertension in pregnancy but with insufficient information for classification into groups 1-4; and, in general, patients who failed to attend the postnatal clinic or who were untraceable for follow-up.

#### RESULTS

During October 1984, a total of 1 863 patients were delivered at Harare Maternity Hospital, and 3 572 were delivered within the GHOU.

There were 334 patients presenting to Harare Maternity Hospital with hypertension in pregnancy during October 1984. The hospital incidence of hypertension was, therefore, 12,2 per cent. Of these 334 patients, 20 were referred from outside the Greater Harare Unit, and 314 were from within the Greater Harare Unit. Of the GHOU patients 214 were delivered during October 1984 (Table I). Hypertension was, therefore, found in six per cent of GHOU patients.

TABLE I — Hypertensive patients, Harare Maternity Hospital, October 1984

Residence	No. hypertensive patients	No. delivered October 1984
Greater Harare area	314	214
Outside Harare	20	13
Total	334	227

There were 49 (22,9%) primigravid patients. The incidence of hypertension in primigravid patients was 6,9 per cent and in multigravid patients 5,8 per cent (Table II).

TABLE II — Number of patients delivered GHOU, October 1984

	Total	Hypertensive	Incidence/100
Primigravid	707	49	6,9
Multigravid	2 865	165	5,8
Total	3 572	214	6,0

#### Classification

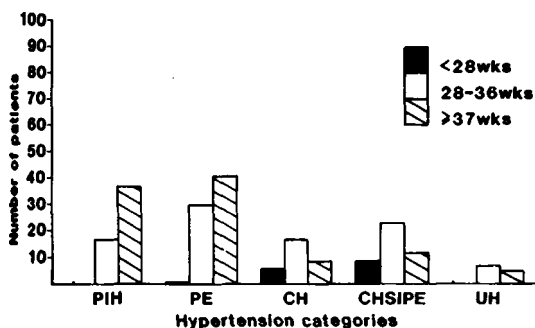
The classification into types of hypertensive disease is given in Table III. Pre-eclampsia was the most common group, present in 72 (33,6%) cases. Pregnancy-induced hypertension and pre-eclampsia together accounted for 126 (58,8%) cases. A total of 122 (57,0%) patients had proteinuric hypertension (72 from the pre-eclampsia group, 44 from the chronic hypertension with superimposed pre-eclampsia group, and 6 from the unclassified group). Intrapartum hypertension alone was present in 39 (18,2%) cases. Eclampsia did not occur.

TABLE III — Classification of hypertensive disease

	Hypertensive n	% patients	GHOU obstetric population %
Pregnancy induced hypertension (PIH)	54	25,2	1,51
Pre-eclampsia (PE)	72	33,6	2,02
Chronic hypertension (CH)	32	15,0	0,90
Chronic hypertension with superimposed pre-eclampsia (CHSIPE)	44	20,6	1,23
Unclassified (UC)	12	5,6	0,34
Total	214	100,0	6,00

The gestational age at onset of the hypertension is shown in Figure 1. One hundred and ten (51,4%) patients presented with hypertension before 37 weeks. In the pregnancy-induced and pre-eclamptic groups 78 (61,9%) patients presented after 37 weeks of gestation.

FIGURE 1 — Gestational age at onset of hypertension



### Age and parity

The age distribution of the patients was compared to that in the general obstetric population (Fig. 2). Hypertensive patients were significantly more likely to be 30 years of age or older ( $p = < 0,001$ ). There was a higher percentage of pre-eclamptic patients less than 19 years of age compared with the general population, although this was not statistically significant. Eleven (15,3%) pre-eclamptic patients were 30 years or older. The majority of patients with chronic hypertension and chronic hypertension with superimposed pre-eclampsia were 30 years or older. However, all age ranges were still represented.

FIGURE 2 — Age distribution by classification of hypertension

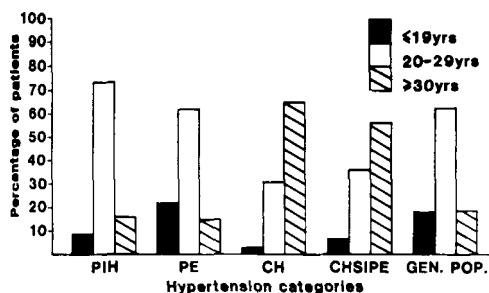
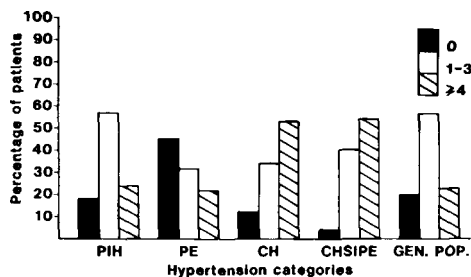


Figure 3 shows the parity distribution of the hypertensive patients compared to the general population. Only 33 (45,8%) pre-eclamptic patients were primigravid, and 16 (22,2%) had a parity of four or greater.

FIGURE 3 — Parity distribution by classification of hypertension



### Height and weight

No significant difference was found between the mean height of the hypertensive patients (160,5 cm) and the mean height of the general obstetric population (159,1 cm).

The mean weight for primigravid patients was significantly less than the mean weight of multigravid patients in all hypertensive categories, except the pre-eclamptic group (Table IV).

TABLE IV — Mean weights of primigravid and multigravid patients

	Primigravid	Multigravid	P. Value
PIH	68,7 (12,3)	78,2 (11,6)	< 0,001
PE	72,7 (13,0)	77,7 (12,7)	*
CH	65,4 (5,3)	81,4 (12,1)	< 0,001
CHS/PE	66,6 (7,2)	84,9 (25,0)	< 0,050

( ) Standard error

\* not significant

### Hypertension and proteinuria

Maximal diastolic blood pressures recorded for each hypertension group are shown in Figure 4. In all groups, except that of chronic hypertension with superimposed pre-eclampsia, the majority of patients had a maximal diastolic blood pressure of less than 110 mm Hg. As the level of maximal

diastolic pressure increased, the percentage of patients with proteinuria also increased (Fig. 5).

FIGURE 4—Highest diastolic blood pressure recorded

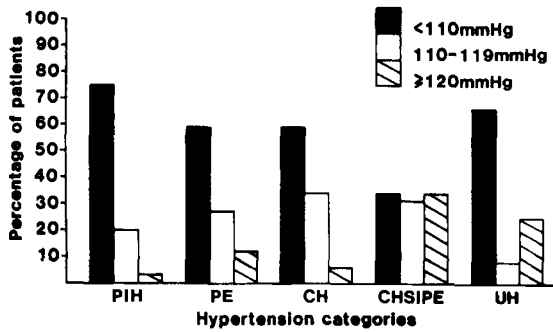
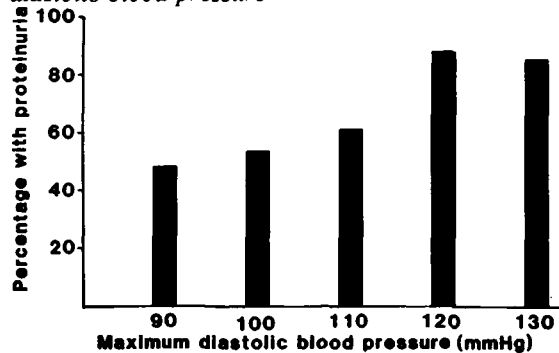


FIGURE 5—Incidence of proteinuria by level of diastolic blood pressure



**Delivery and outcome**

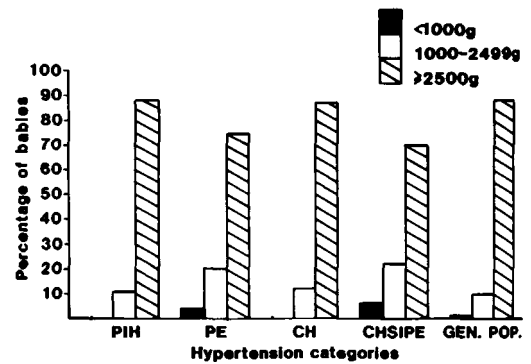
The mode of delivery is shown in Table V. There was a higher caesarean-section rate (14,5%) in the hypertensive group compared to the normotensive patients (8,5%). The caesarean-section rate was highest for patients with proteinuric hypertension (18,0%).

TABLE V — Mode of delivery

	Normotensive		Hypertensive		Total
	n	%	n	%	
NVD	2 967	88,4	174	81,3	
Breech	74	2,2	3	1,4	
Vacuum	31	0,9	6	2,8	
C/S	286	8,5	31	14,5	
<b>Total</b>	<b>3 358</b>		<b>214</b>		<b>3 572</b>

The birth weight of infants born to hypertensive mothers is compared with the birth weight distribution in the general obstetric population in Figure 6. All infants weighing less than 1 000 g were born to mothers with either pre-eclampsia or chronic hypertension with superimposed pre-eclampsia. These cases reflect early onset disease where the patient was electively delivered because of the severity of the hypertension.

FIGURE 6 — Birth weight by classification of hypertension



Eighteen (25,0%) infants born to mothers with pre-eclampsia and 13 (29,5%) infants born to mothers with chronic hypertension with superimposed pre-eclampsia were of low birth weight (< 2 500 g), compared to 11,3 per cent in the general population. Pre-term delivery was an important factor in determining low birth weight but the degree to which growth retardation also contributed is uncertain.

Perinatal mortality for normotensive patient and the hypertensive groups is presented in Table VI. The perinatal mortality rate for hypertensive patients was 79,4/1 000 compared to 26,2/1 000 in normotensive patients. Proteinuric hypertension was associated with a high perinatal mortality rate (98,4/1 000) compared to non-proteinuric hypertensive patients (54,4/1 000).

Patients with pregnancy-induced hypertension had the lowest perinatal mortality rate at 18,5/1 000, and chronic hypertension with superimposed pre-eclamptic patients the highest at 136,4/1 000. There was no perinatal mortality in patients with intrapartum hypertension alone.

The findings of increased perinatal mortality in patients with chronic hypertension is the same as in the study by Knutzen and Davey.<sup>8</sup> In the British Births Survey,<sup>7</sup> however, pre-existing hypertension was not associated with any increase in perinatal mortality compared to normotensive patients. This may indicate differing standards of antenatal care and delivery, or the possibility that the chronic hypertension experienced by the Black African has a more profound, adverse effect on the placenta and foetal growth than in the White Caucasian.

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