

# Malignant hypertension in general practice

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**SUMMARY.** A diagnosis of malignant hypertension was recorded for 165 patients in the national morbidity study between 1970 and 1973. Three patients with benign hypertension were selected as age- and sex-matched controls for each case. The general practitioners in the study were asked to complete a further questionnaire about the patients and 66% of the practices agreed to take part. Information about the retinal findings for the patients was requested and less than half of those in the national morbidity study proved to have a strict diagnosis of accelerated or malignant hypertension although they were originally recorded as patients with malignant hypertension. Of those patients originally classified as having benign hypertension 5% had the retinal appearance of accelerated or malignant hypertension.

Patients had been diagnosed as having hypertension for a mean of more than five years prior to entry into the national morbidity study and the survival of patients with both benign and accelerated or malignant hypertension was good. Thirty-four per cent of those with confirmed benign hypertension and 62% of those with definite accelerated or malignant hypertension died in the follow-up period which was on average 10 years from entry into the national morbidity study.

The survival of patients registered with doctors who did not collaborate and of patients whose clinical details were missing was similar to the survival of patients for whom full details were provided.

Blood pressure control was only fair with a mean of 172/101 mmHg for the group with benign hypertension and 177/107 mmHg for the group with accelerated or malignant hypertension. Blood pressure control was the poorest for those who died from a stroke. A high proportion (78%) of deaths in association with accelerated or malignant hypertension were from cardiovascular or renal causes.

## Introduction

THE survival of patients with malignant hypertension has been greatly increased by current antihypertensive drug treatment. However, most studies have involved selected groups of patients. Over 10 years ago the national morbidity study recorded diagnoses for every consultation in 67 general practices in England and Wales.<sup>1</sup> The study therefore provided a community based 'population' of patients with malignant hyperten-

sion who could be studied. From November 1970 to November 1973 a total of 165 patients from 65 of the practices had been recorded as having malignant hypertension. These patients were matched for sex and age in a 3:1 ratio with 495 controls who had been given a diagnosis of benign hypertension.

In 1976 the Royal College of General Practitioners asked these practices if they would participate in a further study. The objectives of the follow-up study were to determine the absolute and relative rates of survival of patients with accelerated or malignant hypertension and the factors influencing their length of life. Information about the appearance of the retina was used to determine which of the patients in the national morbidity study had a strict diagnosis of accelerated or malignant hypertension.

## Method

The 43 practices (66%) which agreed to take part in the follow-up study were asked to complete a questionnaire giving the following information for each patient: full name of patient, address of patient and date of onset of benign or malignant hypertension; whether the patient had ever had papilloedema or retinal haemorrhages or whether cotton wool spots had been observed; whether he or she had attended hospital for hypertension and if so the name and address of the consultant. The questionnaire also asked for blood pressure measurements, details of drug treatment, the results of any estimations of plasma urea levels and the smoking history of the patients.

Out of the 43 practices there were 100 patients who had been originally diagnosed as having malignant hypertension, and information was provided about 92 patients. From the 311 age- and sex-matched control patients who had been diagnosed as having benign hypertension, information for the present study was obtained about 285 patients.

The Office of Population Censuses and Surveys provided copies of the death certificates for those who had died before 30 June 1983 and all causes of death on the certificate were coded. From the data of the national morbidity study it was possible to determine whether or not a patient from a practice that did not collaborate had died and the causes of death, but only up to 1973 when the study ended. This information was provided without identifying the patient by name.

The patients were subdivided according to the original diagnosis recorded in the national morbidity study and the final diagnosis based on further information obtained about the appearance of the retina. The initial diagnoses were of benign or malignant hypertension and the final diagnoses were categorized as: no hypertension (coding error); accelerated hypertension (retinal appearance of haemorrhages or cotton wool spots at some stage but no papilloedema) or malignant hypertension (papilloedema present at some stage); confirmed benign hypertension (no retinal appearance of papilloedema, haemorrhages or cotton wool spots); and retinal appearance not determined.

Blood pressure control was estimated by taking the mean of all the blood pressure measurements, irrespective of the bodily position of the patient, for each three-month period. The mean blood pressure for that year was then determined by taking the mean of the means for the four three-month periods.

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**Table 1.** Original and final diagnoses made for the 377 patients studied.

Final diagnosis	Original diagnosis	
	Malignant hypertension Number of patients (%)	Benign hypertension Number of patients (%)
Accelerated or malignant hypertension	24 (26)	13 (5)
Accelerated hypertension	10	8
Malignant hypertension	14	5
Benign hypertension	34 (37)	165 (58)
No hypertension	7 (8)	8 (3)
Appearance of retina not known	27 (29)	99 (35)
Total	92 (100)	285 (100)

## Results

### Final diagnoses

Table 1 gives the original and the final diagnoses made for the patients for whom a reply was received from their general practitioner. Only 24 patients (26%) originally diagnosed as suffering from malignant hypertension were finally diagnosed as suffering from accelerated or malignant hypertension as defined here. For a further 27 patients (29%) the appearance of the retina was not recorded. Of those originally diagnosed as suffering from benign hypertension 35% had no record of the appearance

of the retina, 5% had accelerated or malignant hypertension and 3% were reported by the general practitioner to have been wrongly coded as hypertensive.

### Survival and causes of death

The diagnoses of hypertension recorded by the national morbidity study from 1970 to 1973 were generally diagnoses which had been made previously and patients with a diagnosis of malignant hypertension had been known to have hypertension for a mean of nine years and those with benign hypertension for a mean of five years. Therefore the population studied represented mainly a group of 'survivors'. Table 2 gives the number of patients surviving a further 10 years after entry into the study according to the sex of the patient, the original diagnosis, and the final diagnosis based on retinal examination. On entry to the study the mean age of the men was seven years less than that of the women but nevertheless the survival of the two sexes during the study was similar. Of those with an original diagnosis of benign hypertension 63% of men and 65% of women survived for 10 years compared with 48% and 44% respectively of those with an original diagnosis of malignant hypertension.

The final diagnosis, based exclusively on retinal examination, showed an increase in the difference of the survival of the two groups designated as confirmed benign hypertension and accelerated or malignant hypertension. Sixty-six per cent of those with confirmed benign hypertension survived 10 years, 38% of those with accelerated or malignant hypertension (relative risk

**Table 2.** Survival of patients in study according to the original diagnosis and the final diagnosis based on retinal examination.

	Original diagnosis				Final diagnosis			
	Benign hypertension		Malignant hypertension		Confirmed benign hypertension		Accelerated or malignant hypertension	
	Males	Females	Males	Females	Males	Females	Males	Females
Number of patients <sup>a</sup>	136	139	42	48	88	104	21	16
Mean number of years survived with hypertension prior to entry into study	3.9	5.7	7.7	10.4	4.3	5.7	6.1	7.4
Mean age of patients at entry into study	55.8	63.7	56.0	61.7	55.6	62.3	54.4	61.6
Number of patients surviving for 10 years from 1971 (%)	85 (63)	91 (65)	20 (48)	21 (44)	59 (67)	68 (65)	8 (38)	6 (38)

<sup>a</sup> The survival could not be determined from the Office of Population Censuses and Surveys or from the general practice in 12 patients according to the original diagnosis and in seven patients according to their final diagnosis.

**Table 3.** Conditions mentioned on the death certificate according to the final diagnosis made on retinal examination. Survival was determined over an average of 10 years. An individual may have more than one condition entered on a death certificate.

Conditions mentioned on death certificates	Number of patients (% in 10 years)						Ratio of death rate <sup>a</sup>
	Confirmed benign hypertension		Accelerated or malignant hypertension		Final diagnosis uncertain		
	Males	Females	Males	Females	Males	Females	
Myocardial infarction	88	104	21	16	61	60	1.7:1
Congestive heart failure	14 (16)	11 (11)	2 (10)	6 (38)	14 (23)	7 (12)	1.0:1
Cerebrovascular cause	5 (6)	5 (5)	1 (5)	1 (6)	2 (3)	3 (5)	2.4:1*
Renal failure	5 (6)	14 (13)	6 (29)	3 (19)	12 (20)	9 (15)	7.8:1*
Respiratory disease	0 (0)	2 (2)	2 (10)	1 (6)	1 (2)	1 (2)	1.0:1
Neoplasm	5 (6)	5 (5)	2 (10)	0 (0)	6 (10)	5 (8)	1.2:1
	7 (8)	6 (6)	3 (14)	0 (0)	4 (7)	6 (1)	

\*  $P < 0.05$ , Fisher's exact test. <sup>a</sup> Ratio of death rate of those suffering with accelerated or malignant hypertension to those with confirmed benign hypertension, considering both sexes together.

**Table 4.** Treatment received by patients and blood pressure control achieved according to the final diagnosis made on retinal examination.

	Confirmed benign hypertension	Accelerated or malignant hypertension
Number of patients	192	37
Mean total number of different hypotensive drugs prescribed per patient	2.0	3.5
Percentage of patients prescribed various hypotensive drugs at any time (mean maximum daily amount prescribed)		
Methyldopa	52 (1048 mg)	84 (1146 mg)
Clonidine	6	11
Guanethidine	16 (66 mg)	36 (49 mg)
Bethanidine	7 (43 mg)	31 (71 mg)
Debrisoquine	7 (41 mg)	11 (50 mg)
Propranolol	17 (173 mg)	22 (177 mg)
Oxprenolol	7 (246 mg)	3 (320 mg)
Other beta-adrenoceptor blocking drug	0	8
Combined diuretic and potassium supplement	29	19
Frusemide	7	39
Other diuretic	57	72
Mean blood pressure (mmHg)		
In first year of follow up	185/107	197/118
In final year of follow up	167/98	169/102
Overall	172/101	177/107

1.8) and 45% of those for whom the appearance of the retina could not be determined (relative risk 1.6).

Table 3 gives the causes of death according to the final diagnoses made. In the group suffering from accelerated or malignant hypertension there were a higher proportion of deaths associated with stroke and renal failure than in the group suffering from confirmed benign hypertension. The ratios were 2.4:1 for stroke ( $P<0.05$ ), and 7.8:1 for renal failure ( $P<0.05$ ) when both sexes were considered together.

#### *Possible bias induced by non-collaboration or absence of information*

It was possible that patients who died were under-represented in the study owing to the difficulty of obtaining information about patients after they had died, their notes having been returned to the Family Practitioner Committee. Practices that

did not participate had the most missing information. Of 22 patients who died where no information was available, 17 died in the first three years from practices which did not participate and five in participating practices which could not provide the necessary information. By chance there should have been 18 and four such patients, respectively — a close agreement, demonstrating that deaths were probably not under-represented. Moreover, the death rates over an average period of 3.2 years for those for whom information was available, and for those for whom no information was available were similar at 21 deaths per 1000 patient years and 26 deaths per 1000 patient years, respectively.

#### *Treatment received*

Table 4 lists the treatment prescribed to the patients. Diuretics were given to most patients and methyldopa to 31 patients (84%) with accelerated or malignant hypertension and to 99 patients (52%) with confirmed benign hypertension. The adrenergic neurone blocking drugs guanethidine, bethanidine and debrisoquine were also given more frequently to patients with accelerated or malignant hypertension than to those with confirmed benign hypertension. Treatment was more energetic for patients with accelerated or malignant hypertension, a mean of 3.5 drugs per patient being prescribed compared with 2.0 for patients with confirmed benign hypertension. Despite the more intensive treatment the blood pressure control achieved was slightly less satisfactory for the group with accelerated or malignant hypertension, a mean value of 177/107 mmHg compared with 172/101 mmHg for the group with confirmed benign hypertension ( $P<0.01$  for diastolic pressure). Beta-adrenoceptor blocking drugs were prescribed with approximately equal frequency to the two groups.

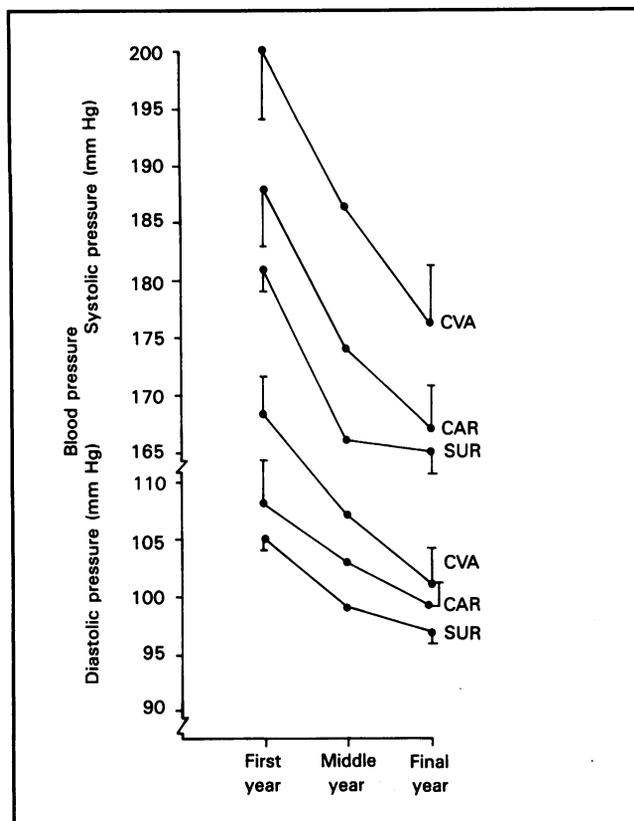
#### *Factors influencing survival*

Table 5 gives details of the blood pressure control of the patients in the two groups and whether they survived for 10 years or not. Patients dying with accelerated or malignant hypertension were on average seven years younger than those dying with confirmed benign hypertension. The proportion of those who smoked tended to be lower in the groups that survived. The mean plasma urea level was higher in those with accelerated or malignant hypertension than in those with confirmed benign hypertension, especially in those who died.

The mean blood pressure was higher in the first year for those with accelerated or malignant hypertension than for those with confirmed benign hypertension but during the final year of follow-up the difference between the groups was not so marked.

**Table 5.** Characteristics of patients according to the final diagnosis on retinal examination and whether they died or survived for 10 years.

	Confirmed benign hypertension				Accelerated or malignant hypertension			
	Dead		Alive		Dead		Alive	
	Males	Females	Males	Females	Males	Females	Males	Females
Number of patients	29	36	59	68	13	10	8	6
Mean age at death (years)	67.6	75.0	—	—	62.8	68.2	—	—
Percentage of patients who smoked	63	30	58	16	83	14	60	0
Mean blood pressure (mmHg)								
In first year of follow up	187/109	200/111	177/106	184/106	203/123	198/119	189/120	198/106
In final year of follow up	174/102	172/98	158/96	172/99	175/106	175/108	167/96	157/95
Initial mean plasma urea level (mmol/l)	7.1	6.5	6.4	6.0	8.5	7.3	7.0	5.5



**Figure 1.** Mean systolic and diastolic blood pressures in mmHg in the first year, middle year and final year of follow up, for three groups: those who died from a cerebrovascular accident (CVA), those who died from a cardiac cause (CAR) and those who survived (SUR). The bars represent one standard error.

### Factors influencing cause of death

Figure 1 shows the blood pressure control during the first year and throughout follow-up for all the patients in the study, irrespective of the appearance of the retina, but according to cause of death. Patients dying of a stroke had higher mean systolic and diastolic pressures than survivors in the first year of follow-up ( $P < 0.01$ ), and in the middle year of follow-up ( $P < 0.01$ ). This was less noticeable in the last year of follow-up ( $P = 0.05$  for systolic pressure,  $P = 0.2$  for diastolic pressure).

### Discussion

The objectives of the study were to determine the rates of survival of patients with accelerated or malignant hypertension and the factors influencing their length of life. The majority of patients had already survived for several years before entry into the study. Not enough patients who were newly diagnosed as having hypertension were followed to allow an estimation of their rates of survival. However, the mean age at death for those with accelerated or malignant hypertension was 63 years for men and 68 years for women. The corresponding figures for those with confirmed benign hypertension were 68 and 75 years, respectively. The presence of accelerated or malignant hypertension reduced the age of death by between five and seven years compared with the presence of confirmed benign hypertension and 38% of patients with accelerated or malignant hypertension survived for 10 years compared with 66% of those with confirmed benign hypertension.

In hospital based clinics in the 1950s and 1960s only 50% of those with accelerated or malignant hypertension survived for

two years.<sup>2-7</sup> The present study indicates that in the 1970s survival rates may have improved although the patients studied here differed in being 'survivors' and not being subject to the processes of selection leading to attendance at a hospital based clinic. No patient in the national morbidity study with malignant hypertension who died had this diagnosis entered on the death certificate, presumably as the importance of this diagnosis had been forgotten.

The national morbidity study was carried out in order to study a group which was representative of the general population. One hundred and sixty-five patients were originally registered with malignant hypertension but three problems were encountered: in the early period of registering diagnoses the patients involved had often had the disease for many years and the data represented a mixture of prevalence and incidence; the diagnostic criteria for registering a patient as a case of malignant hypertension had not been defined; and not all the practitioners were able to collaborate. In hospital practice the accepted criteria for malignant hypertension usually includes the presence of papilloedema on retinal examination. This was not true for general practice where only 15 patients out of 92 fulfilled this criterion.

It is of interest that the survival of patients and their causes of death were the same whether or not their doctors collaborated in the present study. This indicates that the standard of medical care was probably independent of the doctors' willingness to complete further questionnaires. The general practitioners involved in the national morbidity study were all selected by their initial commitment to research and did not represent a random sample of their colleagues. The collaboration rate of 66% was therefore somewhat lower than expected. Fortunately it was possible to examine the survival of all patients for a limited period and thus any serious bias arising from failure to collaborate was excluded.

In a study of deaths from malignant hypertension in London it was suggested that blood pressure control could have been better and 56 out of 68 deaths (82%) were caused by cardiovascular or renal problems.<sup>8</sup> Although better blood pressure control was found in the national morbidity study, 18 out of 23 deaths (78%) in the group with accelerated or malignant hypertension were still caused by cardiovascular or renal problems. In the general population in this age group less than half would be expected to die from cardiovascular problems and patients with accelerated or malignant hypertension experienced an excess of these deaths despite surviving many years with good blood pressure control. Death from renal failure was more common in the London study than in the national morbidity study, but the London study was based on death certificates and patients dying of renal failure after developing accelerated or malignant hypertension may not have survived to appear on the national morbidity study register.

Many patients with accelerated or malignant hypertension can be expected to live for more than 10 years from diagnosis. However, such patients still tend to die from cardiovascular problems and the data suggest that better blood pressure control would prevent a proportion of these deaths. The factors reducing the chances of survival and the age of death were: having the retinal appearance of accelerated or malignant hypertension; being male; and having, at least for deaths from strokes, poor blood pressure control. For patients dying with accelerated or malignant hypertension the mean treated blood pressure in the first year was 201/121 mmHg and this represents a poor level of blood pressure control. Smoking and impaired renal function were also associated with the mortality of these patients.

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## A study of childbirth preparation classes

In the USA, preparation for childbirth with Lamaze classes is becoming an increasingly popular addition to patient education. Lamaze classes provide information about pregnancy, labour, and delivery as well as instruction to the prospective parents in methods of relaxation and structured breathing. The goals are to lessen fear and to provide alternatives to medication in dealing with the discomfort of uterine contractions. Although much has been written on this subject in the last 30 years, objective advantages and disadvantages of this training have not been consistently demonstrated.

A retrospective study investigated its effect on 64-primiparas in comparison with a control group who had not taken classes. The two groups were matched for age, antenatal risk scores, ethnic derivation, and socioeconomic status. No difference was found in the use of analgesia and anaesthesia, the length of labour, type of delivery, incidence of fetal distress, infant birth weights, Apgar scores, or maternal and neonatal complications. There was even a statistically significant increase in the use of oxytocin for augmentation of labour ( $P < 0.01$ ) in the prepared group.

Thus, while childbirth preparation might for some individuals have psychosocial advantages such as a lessening of anxiety, the establishment of a support system, and a mutual parental bonding with the newborn, at the present time it would seem inappropriate to claim consistent and predictable objective medical advantages from such an experience.

Source: Patton LL, English EC, Hambleton JD. Childbirth preparation and outcomes of labour and delivery in primiparous women. *J Fam Pract* 1985; 20: 375-378.

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