CARDIAC INVOLVEMENT IN SEVERE HYPERTENSION

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INTRODUCTION

The importance of hypertension in producing cardiac disease in the form of left ventricular hypertrophy, left ventricular failure and ischaemic heart disease is well recognized. Heart disease was the cause of death in at least one third of patients with untreated hypertension (Pickering 1968).

The aim of this study is to review a personal series of treated severe hypertensives to determine the incidence of heart disease and the effect of treatment on the clinical features and mortality.

MATERIAL AND METHOD

The patients comprised 191 severe complicated hypertensives treated in a hypertensive clinic between January 1951 and December 1969. Most had been followed for at least 10 years. The severity of the hypertension is indicated by Table I. 88% of the patients had a systolic blood pressure level above 200 mm. Hg. and 93% a diastolic level above 120 mm. Hg. 21% of patients were in the malignant phase.

After initial assessment, and stabilization on treatment, patients attended the clinic regularly at intervals of 4 to 6 weeks and were reviewed regularly with tests including E.C.G. and chest radiography. Treatment was with the most effective hypotensive drugs available at the time.

RESULTS

Initial findings

About half the patients had cardiac symptoms and two-thirds signs. The prevalence of the individual features are shown in Table II. Dyspnoea was the commonest symptom and cardiac enlargement or ischaemic pattern on the E.C.G. the commonest signs.

Modification of clinical features with treatment

Symptoms: Marked improvement occurred over the first 2 years with relief of dyspnoea and angina, but the incidence rose again at 5 and 10 years in spite of satisfactory blood pressure control (Table III).

Signs: The incidence of cardiomegaly assessed clinically, radiographically or by E.C.G. decreased over the first year and then remained steady. The incidence of cardiomegaly and its degree of improvement were over-estimated by clinical examination compared with the other methods.

Effect of cardiac involvement on mortality

Survival curves show that the prognosis for treated hypertensives is considerably better than for untreated patients of similar severity and comparable with that of other large series of treated patients, although considerably below that for the general population.

Increased heart size or an abnormal E.C.G. adversely affects the prognosis (Fig. 1), although the effect is small relative to ocular or renal involvement.

Cardiac deaths and incidents in treated hypertensives

The causes of death in the series is shown in Table IV. It is seen that cardiac disease still accounts for about one third of the deaths, but compared with the other two main causes, cardiac deaths tend to occur late. The patients were aged from 40 to 49 years in 8 cases, from 50 to 59 in 10 cases and over 60 years in 9 cases. It is remarkable that the blood pressure control in the year before death was poor in only 2 of the patients dying from myocardial infarction, contrasted with 14 of 21 for the cerebral deaths and 11 of 21 for the renal deaths.

The number of cardiac incidents occurring at various stages of treatment are shown in Fig. 2. This shows that most cases of myocardial infarction occurred late and were usually fatal.

After the first year, the number of cases "per treatment year" seems to remain fairly constant with time, although, due to the decline of number of patients in a particular treatment year with time, the incidence for surviving patients is increasing.

Post mortem examination was obtained in only 30 cases. Left ventricular hypertrophy was reported in 29 cases, but significant coronary atheroma in only 12.

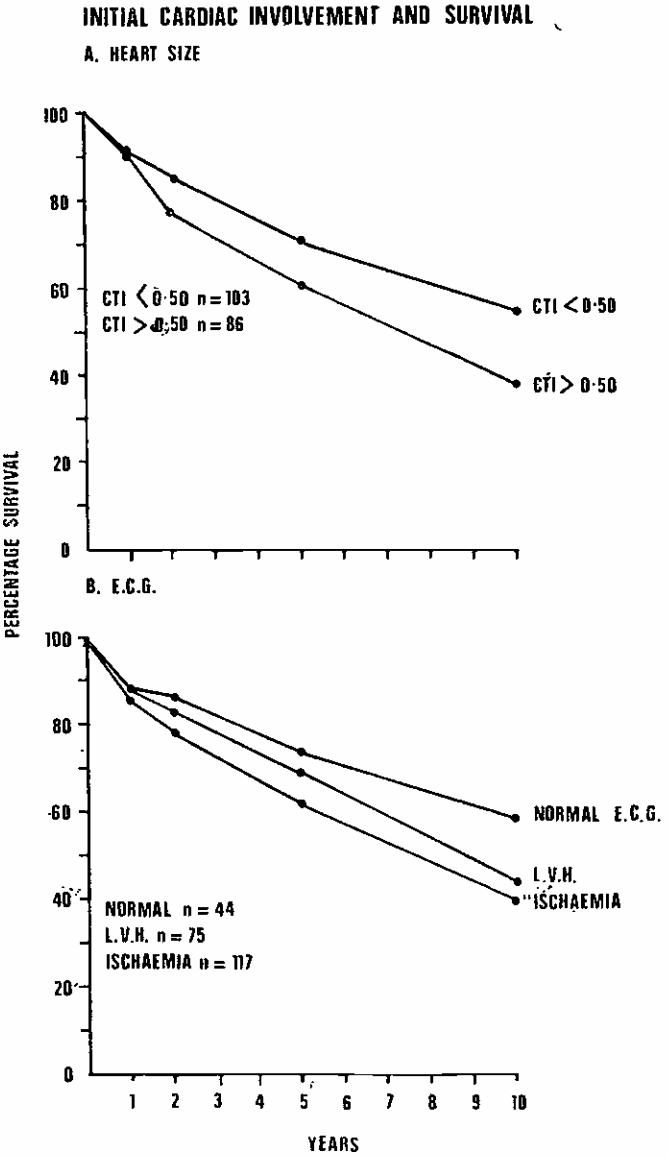

Fig. 1. Effect of cardiac involvement on survival in treated severe hypertension.

COMMENT

A noteworthy finding in this study was the fact that although cardiac deaths still form a high proportion of deaths in hypertension, in treated patients they tend to occur much later than deaths due to cerebral and renal causes and do so in spite of good blood pressure control. This has been commented on by others (Breckenbridge *et al*, 1970). The reason is not clear. It would seem that blood pressure control although protecting against death and cerebral disease, only delays from ischaemic heart disease.

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TABLE I

SEVERITY OF HYPERTENSION

A. BLOOD PRESSURES (mm. Hg.)

	Systolic			Diastolic		
	160-199	200-239	240+	110-119	120-129	140+
No. of patients	24	92	75	16	81	94
		88%			93%	

B. OCULAR FUNDUS GRADE

	0-I	II	III	IV
% Patients	21	23	35	21

TABLE II

CARDIAC SYMPTOMS AND SIGNS

Symptoms	% of Patients
Dyspnoea — exertional	44
— paroxysmal	16
— orthopnoea	2
Ischaemic cardiac pain	11
SIGNS	
Clinical cardiac enlargement	55
Radiological cardiac enlargement	46
Triple rhythm	13
Systolic murmur	46
C.C.F.	4
E.C.G. : Ischaemia	58
L.V. hypertrophy	39
Infarct pattern	2

TABLE III

EFFECT OF TREATMENT ON CARDIAC SYMPTOMS AND SIGNS

Symptoms or Signs	% incidence at stated time				
	Initial	1 Yr.	2 Yr.	5 Yr.	10 Yr.
Exertional dyspnoea	44	15	10	21	33
Paroxysmal dyspnoea	16	4	4	3	7
Angina	11	5	6	7	13
Clinic enlargement	51	26	28	25	28
Radiological enlargement	46	36	38	39	42
E.C.G. — ischaemia	64	47	43	38	38
— L.V. hypertrophy	39	30	25	17	25

TABLE IV

CAUSES OF DEATH IN TREATED HYPERTENSION

	Deaths at State Period		
	0 - 5 years	Over 5 years	Total
Cardiac	9	18	27
Cerebral	18	3	21
Renal	19	2	21
Other (and unknown)	8	9	17

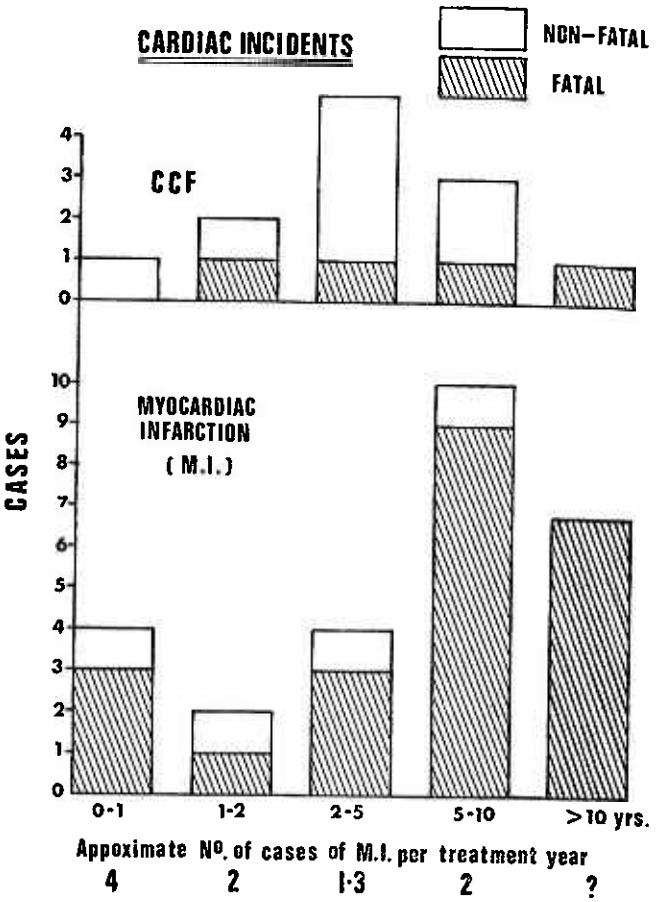

Fig. 2. Cardiac incidents in treated severe hypertension.

There may be other factors operating to a greater extent in recent years. Bauer (1972) has found a higher incidence of myocardial infarction in patients commencing treatment after 1960 compared those commencing between 1955 and 1960.

SUMMARY

1. The initial cardiac involvement in severe hypertension and its modification by treatment have been studied in a series of 191 patients followed up to 19 years.
2. Cardiac involvement was common producing symptoms in about one half and signs in about two-thirds of the patients.
3. There is marked clinical improvement over the first 2 years but tendency to regression at 5 to 10 years.
4. The mortality is adversely affected by cardiac involvement, but to a lesser degree than by cerebral and renal involvement.
5. Cardiac deaths are mainly due to myocardial infarction and are about equal in frequency with cerebral and renal deaths, but the time incidence is markedly different, cerebral and renal deaths tending to occur early and cardiac deaths late, and in spite of good blood pressure control.

REFERENCES

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