Hypertension in the West Indies

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Summary

Hypertension is the most common chronic disease in the West Indies, and is a major health problem today being among the 10 most common causes of death in the English-speaking territories of the region. Most patients have essential hypertension. Renal failure, stroke, and cardiac failure are the most common complications, myocardial infarction being relatively uncommon in black patients.

While an earlier report from the Caribbean suggested that beta-blockers were not effective for treating black hypertensives, recent experience with these drugs show that they are useful particularly when administered along with a diuretic. Beta-blockers may be required in higher doses than those commonly recommended for patients in Europe and North America, but even small doses of thiazide diuretics are effective in lowering the blood pressure of West Indian hypertensives.

West Indians show a combination of personalistic, naturalistic, and modern medical beliefs, which need to be understood in order to mount effective programmes for the management of hypertension in the community.

KEY WORDS: hypertension, West Indians, Caribbean, black hypertensives.

Introduction

In the Caribbean, as in most 'westernized' countries, blood pressure rises with age. Antia *et al.* (1980) showed that from the age of 5 years there was a gradual increase in both systolic and diastolic blood pressure of Jamaican children similar to that seen in black children in Nigeria and the U.S.A. (Fig. 1). Earlier studies by Miall and Cochrane (1961) indicated that the rise in systolic and diastolic blood pressure of black Jamaican adults was almost identical to that of age- and sex-matched white subjects in Wales (Fig. 2).

FIG. 1. Mean systolic and diastolic blood pressures of Jamaican, Nigerian and U.S. black children [from Antia *et al.* (1980) with permission of the Editor].

In the U.S.A., it has been shown on screening that hypertension is more common in blacks than whites (HDFP Cooperative Group, 1977), and Sever *et al.* (1978) in London found that the blood pressure of hypertensive blacks was higher than that of hypertensive whites. Such studies serve to highlight the importance of ethnic factors in hypertension and indicate that in countries with predominantly black populations such as the West Indies, hypertension is likely to be of major significance.

It is estimated from a review of several surveys in the West Indies that 18-22% of adults have blood pressures in excess of 160/95 mmHg (Grell, 1982). As a consequence of this high prevalence, hypertension and problems directly attributable to it have been

FIG. 2. Mean systolic and diastolic blood pressures in males and females in Wales and Jamaica [from Miall and Cochrane (1961) with the permission of the Editor].

TABLE 1. Principal causes of death* (rate per 100,000 population)

Trinidad and Tobago (1976)		St Lucia (1976)		Barbados (1975)		St Kitts and Nevis (1977)	
Diseases of the heart	169.0	Cerebrovascular diseases	91.0	Heart disease	170	Cerebrovascular diseases	155
Cerebrovascular disease	85.9	Heart diseases (excluding IHD)	66.0	Cerebrovascular disease	130	Heart diseases	125
Malignant neoplasms	58.8	Pneumonia (excluding viral)	51.0	Malignant neoplasms	130	Malignant neoplasms	87
Diabetes mellitus	55.6	Senility	51.0	Other circulatory diseases	60	Avitaminosis and nutritional deficiencies	55
Accidents	36.8	Ill-defined conditions	40.0	Hypertensive disease	50	Hypertensive diseases	53
Influenza and pneumonia	32.9	Enteritis and other diarrhoeal diseases	27.0	Pneumonia	40	Enteritis and diarrhoeal diseases	45
Enteritis and other diarrhoeal diseases	27.9	Ischaemia heart disease (IHD)	26.0	Diabetes mellitus	40	Diabetes mellitus	41
Perinatal mortality	23.6	Perinatal mortality	14.0	Perinatal	35	Pneumonia	29
Bronchitis, emphysema and asthma	15.8	Bronchitis, emphysema, asthma	12.0	Motor vehicles accidents	20	Genito urinary system	25
Cirrhosis of the liver	11.4	Cirrhosis of the liver	11.0	All other accidents	10	Diseases of arteries, arterioles and capillaries	16
		Hypertensive disease	10.0				

*From Chief Medical Officer's and Ministry of Health Official Reports.

among the 10 leading causes of death in the English-speaking islands for many years (Table 1).

Aetiological considerations

Because of their common ancestry, genetic factors may help to explain the high prevalence of hypertension in blacks in the West Indies and the southern United States (McLean *et al.*, 1974; Boyle, 1970; Moser, 1960), but there is a mosaic of influences governing the expression of this genetic susceptibility (Page, 1982). One important environmental variable is salt. Racial differences in blood pressure have been

related to differences in the dietary sodium/potassium ratio (Watson *et al.*, 1980), total salt intake (Dahl and Love, 1954) and to abnormalities of sodium handling (Luft *et al.*, 1977; Forrester and Alleyne, 1981; MacGregor *et al.*, 1982). Teleologically, it can be argued that black persons living in tropical environments have evolved a system of conserving salt as a method of surviving in hot climates and that as a result, on a diet identical to whites, blacks retain more salt and so are more likely to become hypertensive.

There are several observations of biochemical differences between black and white hypertensive

subjects, including reports of lower plasma noradrenaline (Jones, Hamilton and Reid, 1978) and lower plasma dopamine β -hydroxylase activity (Levy, Frigon and Stone, 1979) and lower urinary kallikrein (Levy *et al.*, 1977) in blacks compared to whites. However, these findings do not point to a consistently different pathogenetic mechanism, nor have they been easily reproduced. Yet they are often quoted in the literature, serving to over-emphasize their importance and implying fundamental differences in the pathogenesis of hypertension between these 2 ethnic groups rather than to differences in expression of a common abnormality as may be expected from experience with other human diseases.

Even after extensive investigation of hypertensive patients, the majority are found to have essential hypertension and the pattern in Jamaica is similar to that seen elsewhere (Table 2).

TABLE 2. Causes of hypertension at the University Hospital in Jamaica, West Indies (Grell, 1978) and Cleveland Clinic, U.S.A. (Gifford, 1969)

Diagnosis	Percent of patients	
	Jamaica*	Cleveland Clinic†
Essential hypertension	83.3	88.9
Renal	13.3	9.7
Coarctation of aorta	0.8	0.6
Primary aldosteronism	—	0.4
Cushing's syndrome	0.8	0.2
Phaeochromocytoma	0.8	0.2

The report of Laragh (1974) suggested a higher prevalence of 'low renin hypertension' in blacks compared to whites. In black Jamaicans, our own studies showed that the prevalence of low, normal and high renin groups was 31%, 45% and 24% respectively (Grell, Forrester and Robinson, 1981) and that there was no preponderance of 'low renin hypertension'. It is possible that reports from multi-racial societies showing differences in renin levels between blacks and whites may be as much a reflection of socioeconomic and dietary differences, especially differences in chronic salt intake, as it is of differences in the characteristics of the hypertension itself.

Morbidity and mortality

The most common clinical complications of hypertension in Jamaica and the Caribbean are stroke, renal failure and congestive cardiac failure. This differs from the pattern reported in the U.S.A. (VA Cooperative Study, 1970) (Fig. 3). In our experience, myocardial infarction as a sequelae of hypertension is less common in black West Indians than in white populations, and this racial difference has been noted

by Tyroler *et al.* (1971) in the U.S.A. and Cruickshank *et al.* (1980) in Birmingham, U.K. Adelstein (1978), commenting on the proportional mortality rates for immigrants to the U.K. born in Commonwealth countries, noted that hypertension was more common among people of African origin compared to whites or Asians, but that ischaemic heart disease was less common in the group of African origin compared to the other two. There is preliminary evidence from an ongoing study in Trinidad in the West Indies and from clinical experience, that coronary artery disease is more common in East Indians than persons of African origin living under identical conditions (CAREC Surveillance Report 1977).

Diabetes mellitus is associated with hypertension in 30% of Jamaican patients, and it has been shown that the combination of these 2 problems significantly increases the risk of coronary artery disease (Ashcroft and Stuart, 1973).

Renal decompensation secondary to the hypertensive process is common (Fig. 3) and hypertension is the most important single underlying problem producing renal damage necessitating dialysis in Jamaica, Barbados and Trinidad. Goss *et al.* (1969) suggested that blacks are more prone to develop renal damage than whites. However, the high prevalence of renal decompensation in black hypertensives may be largely a reflection of the severity of the blood pressure elevation.

Malignant hypertension is seen in 7% of hypertensives admitted to the University Hospital and the predominant complication is renal failure (Samuel and Grell, 1982).

Therapy

In the early period of the introduction of beta-blockers as an anti-hypertensive agent, a clinical double-blind crossover trial of propranolol in 18 hypertensive Jamaicans showed that there was no significant difference between this beta-blocker and an inert placebo (Humphreys and Delvin, 1968). The results of this study led to the conclusion that beta-blockers were ineffective in black hypertensives. A recently concluded crossover trial using atenolol and chlorthalidone showed that there was a significant fall in both systolic and diastolic blood pressure with a small dose of 25 mg of chlorthalidone, but that at the conventional dose of 100 mg atenolol, only the diastolic pressure showed a statistically significant reduction. However, the combination of atenolol plus chlorthalidone produced a significant reduction in both the systolic and diastolic blood pressure which was greater than with either drug used alone (Grell *et al.*, 1982). While Douglas-Jones and Cruickshank (1976) showed that atenolol at a dose as low as 50 mg

FIG. 3. The pattern of hypertensive complications seen in male Jamaicans* compared with that reported for males in the V.A. study in the U.S.A.† Percentages represent % of those with complications. *Grell, G.A.C. (1982), †Veterans Administration Cooperative Study (1970) CCF: cardiac failure; CVA: stroke; MI: myocardial infarction; KWB: development of malignant phase hypertension.

daily was effective in lowering the blood pressure of white patients, our experience has been that higher doses are required in black Jamaicans to achieve a successful response (Grell *et al.*, 1981).

It is often stated that blacks are more sensitive to thiazide diuretics than to beta-blockers because they have 'low renin' hypertension, but we were unable to show that the pre-treatment plasma renin activity (PRA) was different in those subjects who responded to 100 mg atenolol alone compared to those who required 200 mg atenolol pulse 50 by chlorthalidone daily to lower their diastolic blood pressure below 95 mmHg (Grell *et al.*, 1981). It is possible that renin acts mainly as a 'marker' for factors such as the degree of sodium loading, and that it is not by itself of fundamental importance in explaining ethnic differences in responsiveness to drugs.

At the University Hospital of the West Indies, a few well-known anti-hypertensive drugs are selected for general use (Fig. 4). The step-care approach is promoted as it provides a logical, sequential, and effective practical formula through which management can be rationalized (Grell, 1980). Thiazide diuretics are the most commonly prescribed first line drugs as they are cheap and effective. It is recognized that the metabolic side effects including impaired glucose tolerance, hyperuricaemia, and hypokalaemia, are important consequences (MRC, 1981), but the benefit to be derived in a population where the prime responsibility of physicians is in reducing the overwhelming burden of deaths from severe hypertension (Fig. 5) may outweigh the possible disadvantages at this time. Beta-blockers are, however, the drugs of first choice for patients with clinical evidence of ischaemic heart disease or for those at high

risk of developing this problem. Experience establishing their efficacy, albeit perhaps sometimes at higher doses than recommended for white patients, has made these agents increasingly useful as step-one drugs in the region.

FIG. 4. Drugs used at the University Hospital of the West Indies in the management of hypertension by the step-care approach in 1980 and 1981.

Minoxidil usage may be over-represented here as a clinical trial of the drug was being carried out during the data collecting period. Adapted from a paper presented at a symposium on 'Research and Clinical correlates of anti-hypertensive therapy'. Tallahassee, Florida, U.S.A. (1982).

Public and patient attitudes: education, and the health services

In Barbados, Hassell (1976) in a community blood pressure programme undertaken in 1972 showed that only 40% of hypertensive subjects had been aware of

FIG. 5. Age-adjusted death rates per 100000 population from hypertensive disease in some of the English-speaking Caribbean compared to Canada and U.S.A.

(From Health conditions in the Americas, 1973-1976, Scientific Publication No. 364, Pan American Health Organization, Washington, D.C. 1978 with permission of the Editor).

their elevated blood pressure and that only 13% were on therapy. In a 4-year period of follow-up, compliance was identified as a major problem, and this was related to lack of patient awareness of the importance of blood pressure control, dissatisfaction with clinic facilities, and inability to obtain time off work. Stuart, MacIver and Nicholson (1972) in Jamaica, obtained an 82.5% clinic attendance rate after 12 months and achieved satisfactory blood pressure control (diastolic blood pressure less than 100 mmHg) in 60% of 81 patients after a mean period of follow-up of 26 months. Stuart's group working from a specialized hypertension clinic felt that their good results reflected the advantages of short waiting times, relaxed atmosphere, minimal staff changes, and the fact that drugs were available to the patients from the clinic itself rather than from an overcrowded central pharmacy.

Dressler (1982) interviewing hypertensive patients in St Lucia found that 50-67% gave answers indicating their belief in a personalistic cause (a result of intervention of human, non-human or supernatural agents) rather than a cause as a result of natural forces for their illness. However, many held the view that anxiety and tension may be important in its causation. Most subjects interviewed accepted that persons with high blood pressure must always take pills (92%), yet 52% felt that eating cucumber was good for hypertension and 82% felt that eating green papau was also effective. These findings demonstrate that in West Indian society, personalistic, naturalistic, and modern medical beliefs coexist, and

health personnel must be trained to utilize optimally these combinations to provide effective delivery of medical care.

Donaldson and Anglin-Brown (1982) in a study of Jamaican hypertensives at the time of pre-immigration screening found that 56% had been previously aware of their hypertension. Comparing the known hypertensives (KH) with the newly discovered hypertensives (NH), 85% of both groups were aware that an elevated blood pressure could cause strokes, 55% of the KH and 32% of the NH that it was a cause of cardiac failure, 21% and 9% respectively that it was associated with heart attacks, and 13% and 6% respectively that it caused renal failure. Only 20% realized that treatment was for life and 76% believed that their blood pressure was normal as long as they did not feel ill. Donaldson and Anglin-Brown also found that relatively few patients cited health professionals (48% the doctor, 23% the nurse) as their major source of information about hypertension reflecting an inadequate emphasis on patient education and/or poor comprehension of the material presented, a problem which needs to be rectified in current programmes.

The non-medical members of the health team in the Caribbean, as elsewhere, have a valuable role to play in patient and public education and in the total management of hypertensive patients. With the development of the primary health care services, nurse-practitioners are assuming an increasing responsibility for the management of hypertensive patients in the West Indies. In Barbados, pharmacists run a screening service for detecting high blood pressure and have developed a referral system to general practitioners for persons so diagnosed. The use of community health aids for monitoring the blood pressure of patients in their home environment, as has been initiated in some West Indian territories, may serve to re-enforce the importance of continuous blood pressure control and may be effective in improving drug compliance and clinic attendance.

Research experience in the West Indies should help to provide valuable information about the pattern of hypertension in a black population and may supply important lessons applicable to other developing countries with regards to the management of this disease.

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