Vascular disease in West Indian and white diabetics in Britain and Jamaica

J. K. CRUICKSHANK*
B.Sc., M.B., M.R.C.P.

S. A. ALLEYNE†
B.A.

*University Departments of Medicine, Dudley Road Hospital, Birmingham, England, and
†Mona, Kingston, Jamaica

Summary

Cardiovascular complication rates among matched groups of black and white diabetics in England were compared with those among black diabetics in Kingston, Jamaica. Raised or uncontrolled blood pressure ($\geq 160/95$ mmHg) was common in all groups but diastolic hypertension was more severe in black patients. Despite this, clinical evidence of myocardial ischaemia was significantly more common in whites when compared with blacks in both centres but no such differences were found in peripheral vascular disease. Cataracts were much more frequent, and background retinopathy was slightly although not significantly commoner, in black patients. Complication rates were not correlated with cigarette smoking which was greatest in black men in Birmingham.

The diagnosis and continuous control of hypertension remains a major goal in diabetes.

Introduction

Comparative population studies have provided clues to the aetiology of diabetes (West, 1978) and its complications (WHO Multinational Study, 1979), but it is frequently impossible to disentangle environmental from genetic differences. Migrant populations provide an ideal opportunity to assess the role of the former, with genetic background held constant. The authors recently reported a marked deficit in rates of coronary heart disease among West Indians now living in Birmingham compared with either Asian or white residents (Cruickshank *et al.*, 1980). In this paper is reported part of a study comparing black* West Indian and white diabetics in Birmingham with patients in Jamaica which was undertaken to examine whether ethnic differences in vascular complication rates exist in a group already at increased risk of atheromatous disease.

Methods

All black West Indian patients (WI(B)) attending

* 'black' refers to people of predominantly African (not Asian) origin.

Birmingham General Hospital Diabetic Clinic in a 3-month period, were included of whom 70% had originally come from Jamaica. In the third month, and for the same 2 months of the following year, local white (Caucasian) patients were closely matched with the WI(B) patients for sex, age (to within 3 years) and known duration of diabetes. The duration and type of treatment (diet only, oral agents, failed oral transferred to insulin, or insulin only) was also matched as far as possible. Selection was achieved by inspection of the notes of clinic attenders until best fits for the above criteria were found.

In Jamaica, a systematic sample of one in 10 patients attending the University Hospital Diabetic Clinic over 8 months was investigated. In both centres, patients were interviewed using a standard questionnaire; sitting blood pressure was measured after a rest of 10 min, with a random zero sphygmomanometer; this was followed by clinical examination by the same observer (J.K.C.), of peripheral pulses, and fundal examination for retinopathy after pupils had been allowed to dilate in a darkened room.

Results

Details of patients (Table 1) show that matching between the Birmingham groups was close. Jamaican patients were older, with a longer duration of diabetes. The Jamaican female : male ratio was nearly 3 : 1 and many more patients were on oral hypoglycaemic agents (70%) than in Birmingham. Comparison of complication rates with the other groups should take account of this.

The frequency of anterior chest pain on effort with or without previous documented myocardial infarction was 25% (10 cases) in white men, 9% (4 cases) in WI(B) ($\chi^2=3.1$, $P<0.05$) and 3% (one case) in Jamaican men. A similar trend was found in women with myocardial ischaemia in 9 cases (25%) in whites, 5 cases (14%) in WI(B) and 4 cases (4%) in Jamaicans. In women, the only statistically significant differences were found when comparing

TABLE 1. Details of West Indian and white diabetics in Britain and Jamaica and type of treatment employed

	Men			Women		
	WI(B)	White	Jamaican	WI(B)	White	Jamaican
Mean age (years)	55.0	55.4	60.4	54.1	54.6	59.3
± s.d.	8.5	10.1	13.2	10.0	12.1	12.1
(Range)	(36–75)	(33–78)	(16, 35–80)	(35–80)	(31–82)	(25–83)
Mean known duration of diabetes (years)	6.6	7.1	10.4	8.1	8.0	11.0
± s.d.	4.3	5.6	6.9	6.1	6.3	6.4
(Range)	(1–23)	(1–24)	(1–16)	(1–24)	(1–25)	(1–30)
Type of treatment						
Diet only	4	4	0	6	4	7
Oral agents	21	20	24	15	16	69
Insulin, failed oral	10	12	5	12	11	9
Insulin only	7	5	7	2	2	10
Total no.	42	41	36	35	33	95

WI(B) = West Indian, black.

whites in Birmingham with Jamaicans ($\chi^2=9.68$, $P<0.01$).

Twenty per cent. of white male diabetics were current cigarette smokers, as were 42% of WI(B) men and 31% of Jamaicans. The frequency of smoking in WI(B) men was significantly greater than in whites ($\chi^2=5.6$, $P<0.02$). However, of those who did smoke, only 50% of WI(B) men, compared with all white men, smoked more than 10 cigarettes per day. Cigarette smoking was uncommon in women in all 3 groups studied.

Although average systolic blood pressures in whites and blacks in Birmingham did not differ significantly (whites 156.2 ± 25.1 (s.d.) mmHg; blacks 155.6 ± 32.1 (s.d.) mmHg), blacks did have

FIG. 1. Mean (± s.d.) diastolic BP in age-matched white □ and black (WI(B)) ■ diabetics attending the diabetic clinic at General Hospital, Birmingham, England.

higher diastolic pressures (Fig. 1). Hypertension, defined by the WHO criteria as greater or equal to 160/95 mmHg or below that level whilst on treatment, was found in 74% of WI(B) women of whom one third had uncontrolled pressures (Fig. 2).

FIG. 2. The prevalence of hypertension $\geq 160/95$ mmHg in black (WI(B)) and white diabetics in Birmingham, England, compared with blacks in Kingston, Jamaica.

Peripheral vessel disease, assessed by symptoms questionnaire for intermittent claudication, occurred in approximately 10% of Birmingham patients with no differences between groups or sexes, but in only 4% of patients in Jamaica. Loss of dorsalis pedis pulses was found less often among WI(B)s (12 cases) than whites (21 cases) but this difference was not statistically significant.

Assessment of microvascular disease was hindered

FIG. 3. The frequency (%) of cataracts and of background retinopathy in black (WI(B)) and white diabetics in Birmingham, England, compared with blacks in Kingston, Jamaica.

by the marked excess of cataracts among Jamaican (43%) and WI(B) patients (38%) compared with white men (10%) or women (22%). Rates of total background retinopathy in adequately visualized fundi (Fig. 3) were not significantly different between Birmingham groups and were highest in Jamaicans whose duration of diabetes was longest.

Discussion

Comparative studies in diabetic clinics are always limited by the vagaries of clinic selection and attendance, and interpretation of results has to be cautious. However, the authors have previously found equal, although substantial rates of loss to follow-up of blacks and whites attending the Diabetic Clinic at the General Hospital, Birmingham (S. G. Barber and J. K. Cruickshank unpublished), so differences in default rates are unlikely to explain the ethnic differences found here. The frequency of clinical ischaemic heart disease does seem to be lower in West Indian diabetics, whether in Britain or Jamaica. This trend is similar to that reported in non-diabetic patients. The relative deficiency of myocardial ischaemia is present despite higher smoking rates and higher diastolic blood pressures. Long-term follow-up, with pathological comparison of coronary arteries, would provide definitive evidence. An excess of autonomic neuropathy among WI(B)s, causing less perception of pain, is an unlikely explanation as pulse rates, frequency of impotence, and peripheral diabetic neuropathy did not differ between Birmingham men (J. K. Cruickshank unpublished observation).

Specific diabetic microvascular disease, detected by retinopathy is primarily dependent on duration of diabetes (WHO Study, 1979), and was commonest in Jamaican patients whose duration of illness was

longer. The less objective clinical assessment of peripheral vessel status also showed no ethnic or geographical differences. The disparity between these endpoints and coronary artery disease may be related to the more rapid whole blood fibrinolytic activity and other thrombotic precursors reported in normal black populations (Szczekli *et al.*, 1979).

The outstanding feature of these results is the prevalence of casual hypertension, exceeding 40% in all groups, and reaching 74% in WI(B) women. The contribution of hypertension as a primary risk factor for outcome in diabetes has been underexplored, and no major intervention trial on treatment of high blood pressure in diabetics has been mounted. With the increased prevalence of hypertension in black diabetics, the present results suggest an urgent need for such a trial, in which outcome in black and white patients in British clinics could be compared. Differences in haemostatic variables should be investigated simultaneously, allowing further rational therapeutic trials thereafter.

References

- CRUICKSHANK, J.K., BEEVERS, D.G., OSBOURNE, V.L., HAYNES, R.A., CORLETT, J.C.R. & SELBY, S. (1980) Heart attack, stroke, diabetes and hypertension in West Indians, Asians and whites in Birmingham, England. *British Medical Journal*, **281**, 1108.
- SZCZCKLIK, A., DISCHINGER, P., KUEPPERS, F., TYROLER, H.A., HAMES, C.G., CASSEL, J.C. & CREAGAN, S. (1980) Blood fibrinolytic activity, social class and habitual physical activity II: a study of black and white men in Southern Georgia. *Journal of Chronic Disease*, **33**, 291.
- WEST, K.M. (1978) *Epidemiology of Diabetes and its Vascular Complications*. Elsevier, New York.
- WHO MULTINATIONAL STUDY OF VASCULAR DISEASE IN DIABETES (1979). (Ed by Jarrett, J., Keen, H. & Grabauskas V.) *Diabetes Care*, **2**, 175.