Sickle cell trait and diabetic retinopathy

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SUMMARY The presence of sickle cell trait and the prevalence and severity of retinopathy were assessed in 124 Negro diabetics. Sickle cell trait had no adverse effect on diabetic retinopathy.

Retinal neovascularisation occurs infrequently in sickle cell anaemia (Condon and Serjeant, 1972a) but slightly more commonly in other haemoglobinopathies such as sickle cell haemoglobin C disease (Condon and Serjeant, 1972b) and sickle cell thalassaemia (Condon and Serjeant, 1972c). It has been reported in 2 patients with sickle cell trait, 1 of whom had diabetes mellitus (Goldberg and Acacio, 1973). We wondered if sickle cell trait might aggravate diabetic retinopathy by inducing sickling in pre-existing areas of focal ischaemia and hypoxia in the retina. A study was therefore performed to determine whether the presence of sickle cell trait affected the prevalence or severity of diabetic retinopathy, especially the development of neovascularisation.

Patients and methods

We could identify 446 West Indian diabetics attending the clinic with the help of a computerised record system. From this group 13 of 16 Negro diabetics with known background retinopathy (2 had died and 1 was untraced) were studied, together with a random selection of those not known to have retinopathy with the longest clinic attendances. No case of retinal neovascularisation had been identified in all these Negro diabetics prior to this study.

Corrected visual acuity and fundal examination after pupillary dilatation was performed by one of us (J.P.), who was unaware of the results of haemoglobin electrophoresis. Statistical significance was assessed by the chi-square test with Yates's correction.

Results

There was no significant difference between the proportion of diabetics with sickle trait in those with neovascularisation or background retinopathy, or

Table 1 *Details of patients*

Group		Haemoglobin electrophoresis	
		Sickle trait	Normal
Neovascularisation	Number	4	23
	Average age (years)	52.0 (40-61)	57.3 (36-76)
	Average duration of diabetes (years)	5.3 (2-12)	9.8 (1-20)
Background retinopathy	Number	8	41
	Age	53.3 (46-63)	54.1 (36-76)
	Duration of diabetes	9.6 (3-20)	9.3 (1-18)
No retinopathy	Number	6	42
	Age	57.3 (40-70)	48.4 (37-72)
	Duration of diabetes	5.2 (2-6)	5.8 (1-21)

Mean age and duration of diabetes shown, with range in parentheses.

among those without retinopathy. Average age and duration of diabetes was the same in all 3 groups (Table 1).

Three of the 4 patients with sickle trait had developed new vessels within 3 years of diagnosis of diabetes compared with 4 of 23 with normal haemoglobin electrophoresis, but the difference was not significant ($P > 0.20$). There was no significant difference in visual acuity between the groups. There were 10 eyes with visual acuity equal to or less than 6/60 in the non-sickle neovascularisation group but none in those with sickle trait. One diabetic was found to have sickle cell haemoglobin C disease and had minimal background retinopathy after 15 years of diabetes.

Discussion

The results seem to exclude the possibility that sickle cell trait might aggravate diabetic retinopathy. The prevalence of sickle cell trait was not increased in diabetics with background or proliferative retinopathy and there was no diminution in visual acuity in those with sickle trait. We conclude that sickle

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cell trait has no influence on the presence or severity of diabetic retinopathy.

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