Prevalence of retinopathy in a Sri Lankan diabetes clinic

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Summary

Objective: To determine the prevalence of diabetic retinopathy among patients with non-insulin dependent diabetes (NIDDM) attending a Sri Lankan diabetes clinic and assess the skills of non-ophthalmologist in screening for retinal disease.

Research design and method: One thousand and three consecutive diabetic patients were screened for diabetic eye disease using a standardised technique based on the WHO Multinational Study.

Results: 31.3% (95% confidence intervals 28.0% to 31.6%) had retinopathy, 23% (95% confidence intervals 21% to 25%) had cataract and 20% (95% confidence intervals 17% to 23%) had previously undetected refraction errors. 4.1% (95% confidence intervals 2.1% to 6.0%) of patients were blind due to advanced retinal disease while 6.2% (95% confidence intervals 5.0% to 7.2%) were blind as a result of cataract. General physicians had a 90.6% sensitivity and 100% specificity in screening for retinal disease.

Conclusions: Retinopathy accounts for significant visual handicap. Untreated cataract is more commonly associated with blindness. Undiagnosed errors of refraction account for significant visual handicap in Sri Lankan diabetic patients. Physicians trained in techniques of retinal screening can correctly assess diabetic retinal changes in a high proportion of patients.

Introduction

Diabetic retinopathy is one of the leading causes of visual handicap and legal blindness in the United States (1). The annual costs of retinopathy for community support, welfare payments and loss of income from absenteeism alone come to US $ 75 000 000(2). Clinical trials have shown that early laser photocoagulation can reduce visual loss and blindness from diabetic retinopathy(3,4). Laser treatment does not improve vision, but prevents its deterioration. Hence those with good visual acuity at the time of detection of treatable retinal disease will have good results from laser photocoagulation therapy. However, data from several surveys have shown that the care of diabetic patients with regard to screening for retinopathy is suboptimal even in the developed world(5). Careful examination of the fundus through dilated pupils is essential for early diagnosis of diabetic retinopathy. If patients are examined without dilating the pupil proliferative retinopathy is missed in 50% of examinations(6). In the United States 80% of primary care physicians claimed to have examined the retina of their diabetic patients within a 12 month period but less than 1% had dilated the pupil(1,7). In the Wisconsin Epidemiologic Study of Diabetic Retinopathy, only 483 out of 1444 patients with retinopathy were aware of their problem(1). It has been recommended that physicians should perform a retinal examination on all diabetic patients at least once a year(8). This is not routine practice in Sri Lanka. In November 1990 a diabetes retinopathy screening programme was implemented at Sri Jayawardenepura General Hospital (SJGH) diabetes clinic. At that time the SJGH was the only centre in Sri Lanka with a laser photocoagulation facility. The aim of the screening programme was to detect diabetic eye disease early in order to obtain maximum benefit from laser treatment. The aims of this study were to determine the prevalence of diabetic retinopathy and cataract in patients with NIDDM attending a diabetes clinic, assess the skills of a general physician in screening for retinopathy and to evaluate the efficacy of the screening programme.

Materials and methods

A total of 1431 patients were registered at the diabetic clinic at SJGH from October 1990 to September 1991. All 1123 patients with non-insulin dependent diabetes were selected. A questionnaire was completed by each patient on which was recorded name, age, sex, date of diagnosis of diabetes and current and previous treatment. Corrected visual acuity was recorded for each eye using a Snellen's chart. Patients were requested to bring their spectacles for the eye test. Pinhole correction was used when spectacles were not brought. When visual acuity was improved to 6/9 or better with pinhole correction or with corrective lenses the patient was classified as having

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a previously undiagnosed error of refraction. The definition of legal blindness was taken as visual acuity 6/60 or worse.

Fundus examination was performed after pupils were dilated to at least 3 mm. The patients gaze was fixed except when examining the macular areas when they were asked to look directly at the light. Presence or absence of lens was recorded. If retinal detail was not clearly seen the reason was noted.

Optic fundi were graded according to criteria used for the WHO multinational study on diabetes(9). The general term red lesion was used as it can be difficult to distinguish between microaneurysm and haemorrhage. Lesions with a diameter less than a retinal artery at the optic disk were called small red lesions. A medium red lesion was smaller than the optic disk, and those larger than the optic disk were called large red lesions. They were counted and graded as follows: none, one, two to five, six or more. Hard and soft exudates were also counted and graded in the same way. The presence of new vessels was recorded as present or absent.

Minimal small vessel disease was defined as one small red lesion or one hard or soft exudate in either eye. Moderate small vessel disease was defined as two or more small red lesions or one or more medium red lesions or two or more exudates hard or soft in either eye. Severe small vessel disease was defined as new vessels in either eye, one or more large red lesions or vitreous opacity or haemorrhage in either eye.

Fundi were examined by two non-ophthalmologists (physicians) and patients who were thought to need laser treatment were referred to an ophthalmologist.

A group of 200 patients randomly selected from the clinic register were examined by a consultant ophthalmologist who was blinded to the findings of the physicians. These patients were classified independently by physicians and ophthalmologist as retinopathy present or absent, and if present, as those not needing photocoagulation those likely to benefit from photocoagulation (preproliferative retinopathy, proliferative retinopathy and maculopathy,) and those unlikely to benefit from photocoagulation (cataract and advanced retinal disease such as retinal detachment and fibrosis).

Results

Complete records were available for one thousand and three diabetic patients (567 men), mean age 51.7 SD 8.9 years and mean duration of diabetes of 6.7 SD 4.1 years.

Three hundred and fourteen (31.3%) patients (177 men) were found to have small vessel disease of the eye (95% confidence intervals (CI) 28% to 34.6%). 160 (16%) had minimal small vessel disease, 95 (9.5%) moderate small vessel disease and 59 (5.9%) had severe small vessel disease. 53 patients had retinopathic changes at the time of diagnosis of diabetes. 4.1% (95% CI 2.1% to 6%) of all diabetic patients were blind due to retinopathy.

23% (95% CI 21% to 25%) had cataract at examination or gave a history of cataract extraction. If slit lamp examination had been performed this proportion would be greater. 62 (6.2%, 95% CI 5% to 7.2%) patients with cataract were blind. 12 in both eyes and 50 in one eye. 55% of those with cataract had visual acuity 6/9 — 6/60. In 20 patients with bilateral cataract it was not possible to assess retinal details. 20% of all diabetic patients (95% CI 17% to 23%) had previously undetected refraction errors. 156 diabetic patients (15.5%) required laser treatment.

The results of ophthalmologist's and physician's classification of eye disease is shown in Tables 1 and 2.

Table 1. Tests of validity of assessments on need for photocoagulation therapy

	Ophthalmologist's opinion Laser treatment		*Total*
	Indicated	*Not indicated*	
Physician's opinion Laser treatment			
Indicated	20	6	26
Not indicated	0	174	174
Total	20	180	200
Sensitivity 100% Specificity 96.6%			

Table 2. Tests of validity for screening for retinopathy

	Ophthalmologist's opinion		*Total*
	Retinopathy	*No retinopathy*	
Physician's Opinion			
Retinopathy	39	0	39
No retinopathy	4	157	161
Total	43	157	200
Sensitivity = 90.6%			
Specificity = 100%			

Discussion

Until now little could be done for patients in Sri Lanka with diabetic retinopathy due to lack of laser treatment facilities. These facilities are now available. In order to plan optimal allocation of laser facilities information is required on the extent of diabetic eye disease in Sri Lanka. 31.4% of patients attending the diabetes clinic had retinopathy and 15.5% required laser treatment. The confidence intervals for the proportion of patients with retinopathy suggest that if these results are applied to other clinics in Sri Lanka the true prevalence of retinopathy would lie between 28% and 34.3%. In a similar study performed in the UK(10) half the patients discovered to have retinopathy were already awaiting laser photocoagulation. In our study retinopathy was recorded and the patient warned of the need for regular eye screening for the first time during the course of the study in all patients. 5.3% of patients had retinopathy at the time of diagnosis of diabetes. This may reflect a prolonged period of asymptomatic hyperglycaemia before diabetes was diagnosed(11).

Our results differ from those seen developed countries. In the UK diabetic retinopathy is the commonest cause for blindness among diabetic patients(12). In Sri Lanka although diabetic retinopathy accounts for significant visual handicap in diabetic patients, cataract and uncorrected refraction errors appear to be a commoner cause for visual handicap. These differences may reflect the fact that cataracts and refraction errors remain undiscovered and unattended due to lack of routine screening for such problems in Sri Lanka.

The onset of diabetic retinopathy cannot be prevented, but early detection by screening for retinopathy and appropriate intervention may prevent or minimise visual handicap(4,5). An evaluation of photocoagulation services in the UK has shown that the cost of laser treatment was £ 170 per eye per year, whereas the cost of maintaining one blind person per year was £ 2 871(13).

Screening for diabetic retinopathy is cost effective. It detects retinal disease in 88% of patients with sight threatening retinopathy and reduces the risk of blindness in diabetic patients by 56%(14). It has been estimated that blindness can be prevented in 2 to 4% of diabetic patients every year in Sri Lanka(15).

Diabetic retinopathy is a common disease in Sri Lankan diabetes clinics; it is often asymptomatic, and early diagnosis and treatment can significantly alter prognosis. Hence it fulfils all the criteria for initiating a screening programme. We conclude that diabetic eye disease is a significant problem in patients attending diabetes clinics and recommend that routine retinal screening programme for diabetic patients be implemented at diabetes and medical clinics in Sri Lanka.

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