Retinopathy in diabetic patients evaluated at a primary care clinic in Cape Town

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To the Editor: Diabetic retinopathy is the fifth leading cause of global blindness, affecting an estimated 1.8 billion people and responsible for 4.8% of blindness.[1] In South Africa, it is the third leading cause of blindness after cataract and glaucoma, and is responsible for 5% of blindness (0.04% of the total population). Cataract and refractive error are prioritised for the first phase of Vision 2020 in South Africa, while strategies to deal with diabetic retinopathy are recommended as a priority for the second phase.[2] These strategies will include provision of adequate screening and argon laser treatment.

The prevalence of diabetes differs in different population groups in South Africa. Among black and coloured South Africans, diabetes has risen from 3% to 12% over the past 10 years. Overall, the prevalence is conservatively estimated to be 3 - 5% (30 000 - 50 000 per million population).[2] The prevalence of retinopathy in people with diabetes is estimated to be 20% (6 000 - 10 000 per million population), and the prevalence of blindness among these is estimated to be 5% (300 - 500 blind per million population).[2]

The objective of this study was to evaluate the retinopathy status of patients with diabetes seen at a primary care clinic in Cape Town and to assess the adequacy of the current diabetic screening programmes.

Methods

Two hundred and forty-eight consecutive patients with type 2 diabetes were seen at Robbie Nurock Day Hospital in Cape Town between 15 September 2005 and 21 November 2005. An interview elicited the duration of their diabetes, and whether or not they had had previous fundoscopy. Examination included best corrected visual acuity and undilated fundoscopy using a direct ophthalmoscope. If retinopathy was detected, or if the view was not adequate, fundoscopy was repeated with pupil dilatation. Retinopathy status was classified according to the Early Treatment of Diabetic Retinopathy Study (ETDRS) classification.[3]

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Results

The study population consisted of 124 (50%) black, 119 (48%) coloured and 5 (2%) white persons, and 1 Asian person. Gender distributions were 171 (69%) female and 77 (31%) male. Of these patients, 23.6% (95% confidence interval (CI) 18.3 - 28.9%) had had previous fundal examination at some stage in their diabetic history, but only 5.2% (95% CI 2.4 - 8.0%) had had regular annual fundoscopy as recommended. It was found that 4.4% (95% CI 0.0 - 7.0%) had visual impairment (6/24 - 6/60) or severe visual impairment (6/60 - 3/60) due to diabetic retinopathy. The prevalence of diabetic retinopathy was 32.3% (95% CI 5.4 - 12.4%), with 8.9% (95% CI 5.4 - 12.4%) having sight-threatening retinopathy requiring urgent referral to an ophthalmologist for laser treatment (Table I). Only 2% (95% CI 1.4 - 2.6%) had been previously assessed as needing laser treatment and were being followed up in a tertiary setting.

It was also noted that diabetic patients frequently experience ocular disorders other than diabetic retinopathy (Table II). A prior Joslin Vision Network Protocol (JVN) study found that 25.9% of patients had abnormalities other than diabetic retinopathy requiring referral for a comprehensive eye exam.[4]

Patients who were diagnosed with sight-threatening retinopathy and other serious ocular conditions were urgently referred, and these accounted for 11.3% of the sample size. Other patients with mild or moderate retinopathy and other ocular conditions such as cataract were also referred 'non-urgently', and these accounted for 29% of the sample size (22% due to diabetes, and 7% due to other eye conditions). Of the total 248 patients, therefore, 40% required an ophthalmologist review.

Ethnicity, age and gender did not appear to be associated independently with a greater degree of diabetic retinopathy; however, the sample size was too small to obtain statistically significant results.

Discussion

It is evident from these statistics that we are falling well short of the recommended screening protocols for diabetics. The advantages of adequate screening are paramount, both for the patient in question and economically. Retinopathy diagnosed early, and followed closely, results in more timeous laser treatment, preventing complications of proliferative retinopathy, and most importantly, blindness. 'Too little too late' probably best summarises the reality of diabetic

Table I. Findings on fundal examination

	No.	% (95% CI)
No retinopathy	168	67.7 (61.9 - 73.5)
Mild non-proliferative retinopathy	54	21.8 (16.7 - 26.9)
Moderate non-proliferative retinopathy	4	1.6 (0.0 - 3.2)
Severe non-proliferative retinopathy	1	0.4 (0.0 - 1.2)
Proliferative retinopathy	6	2.4 (0.5 - 4.3)
Clinically significant macula oedema (CSMO) + mild non-proliferative retinopathy	3	1.2 (0.0 - 2.6)
CSMO + moderate non- proliferative retinopathy	6	2.4 (0.5 - 4.3)
CSMO + severe non-proliferative retinopathy	9	1.2 (0.0 - 2.6)
CSMO + proliferative retinopathy	3	1.2 (0.0 - 2.6)

Table II. Other pathology diagnosed on fundoscopy

	No.	% (95% CI)
Cataract	18	7.3 (4.1 - 10.5)
Glaucoma – suspect	7	2.8 (0.7 - 4.9)
Retinal detachment	4	1.6 (0.0 - 3.2)
Maculopathy	3	1.2 (0.0 - 2.6)
Retinal vein occlusion	2	0.8 (0.0 - 1.9)
Unknown	4	1.6 (0.0 - 3.2)

retinopathy management generally in the public sector in South Africa.

It was found that there was a general lack of awareness among the diabetic patients with regard to the existence of diabetic eye disease, and the importance of screening. Only 10.4% of patients were aware that annual fundoscopy was a requirement. This emphasises the importance of education as part of the screening process.

Assuming a prevalence of 3 - 5%, there are 30 000 - 50 000 people with diabetes in each health district of 1 million population who require annual screening fundoscopy. Forty per cent of the diabetic patients seen required referral to an ophthalmologist and possibly further intervention, a very significant figure considering that there are 47 day hospitals in Cape Town, and only 2 tertiary centres receiving referrals. The ophthalmology departments in both these hospitals are already working well beyond capacity. It would be unreasonable to believe that they would be able to cope with the further burden of referrals from day hospitals should a proper screening programme be implemented. It is essential that alternatives be found.

The recommendation for the management of retinopathy in individual patients and for the Vision 2020 programme strategy for diabetic retinopathy is: (*i*) baseline fundoscopy at the initial diagnosis of diabetes; (*ii*) annual fundoscopy screening; (*iii*) on detection of retinopathy, referral to an ophthalmologist for follow-up; (*iv*) depending on the severity/grade of retinopathy, 3 - 6-monthly fundoscopy by the ophthalmologist; (*v*) panretinal laser treatment for severe non-proliferative retinopathy and proliferative retinopathy; and (*vi*) either focal or grid laser treatment for maculopathy.[1]

Dilated indirect ophthalmoscopy coupled with biomicroscopy, and 7 standard field stereoscopic 30º fundus photography are both accepted methods for examining diabetic retinopathy.[5] These methods are time consuming and require a degree of ophthalmological training to assess the fundus accurately. Day hospitals are extremely busy, and medical officers generally do not stay beyond 6 months. This does not allow enough time for adequate ophthalmological training and accurate screening.

Another option for screening is to use a non-mydriatic fundus camera linked to a tele-ophthalmology facility, with the fundus photographs checked by an ophthalmologist at a central ophthalmology clinic or reading centre.[6] The Western Cape health department has acquired a non-mydriatic camera and currently has a pilot project running at 3 of the day hospitals. One ophthalmic technician has been trained to take the photos which will then be sent to a reading centre for assessment. An adequate recall system will obviously also be required for this to be successful. An argon laser has also been acquired and placed at the Cape Town Technikon where panretinal and focal laser will be performed.

Assuming an annual incidence of 0.03% of macular oedema and 0.02% of proliferative retinopathy in a health district of 1 million people, there would be 500 new cases requiring laser treatment each year. If the time required to provide focal or grid macular laser treatment to 2 eyes is 1 hour and the time required to provide panretinal laser treatment to 2 eyes is 2 hours, the total laser hours required in each health district of 1 million population is about 700 hours per year. Assuming a 40-hour working week and a 50-week working year, it seems that 30% of the working time of 1 ophthalmologist in each district of 1 million might be taken up just doing laser treatment for diabetic retinopathy. This is not feasible. An option for providing the laser treatment is to train non-ophthalmologist medical officers to administer the treatment.

This is visually demanding and tiring work, and it would not be possible for any one person to do this work for more than 2 - 4 hours each day. The possibility is therefore for an argon laser machine in use for 15 - 20 hours each week in each health district, with the treatments being administered by a team of medical officers working 2 - 4-hour shifts, and with the machine receiving timeous and efficient servicing and maintenance to avoid down-time from breakages.

This cross-sectional study highlights the deficiencies that exist in the current screening and management of diabetic patients, and highlights the need to include diabetic retinopathy as a priority in our Vision 2020 programme.

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Health and demographic surveillance sites contribute population-based data on maternal deaths in rural areas

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To the Editor: Maternal mortality remains an important public health challenge in South Africa despite government initiatives to monitor and reduce maternal deaths.[1] In particular, the mandatory notification of maternal deaths, with rigorous investigation through the National Committee on Confidential Enquiries into Maternal Deaths, has been an important national intervention to quantify the problem and monitor trends. However, this system of enquiry is fundamentally health service-based, and data are collected largely through record review and notification forms submitted from the health facility where the death occurred.[2] The vital registration system offers another source of maternal death data, but reporting of deaths, particularly in rural under-resourced areas, is incomplete. While death registration has increased nationally from 54% in 1990 to 89% in 2000, only 78% of deaths were registered in rural Limpopo province in 2002.[3,4] In contrast, health and demographic surveillance sites (HDSSs), which collect household-level data on all births and deaths in a defined population, are able to identify maternal deaths that occur in the community. Moreover, this system provides an opportunity to interview those close to the deceased, using the verbal autopsy method, to gain an understanding of possible causes, as well as contributory and avoidable factors that led to the death.[5]

The Agincourt HDSS, located in the rural north-east of South Africa, is 1 of 3 such sites in the country (Dikgale DSS, University of Limpopo, and Africa Centre DSS, University of KwaZulu-Natal, are the other 2 sites). A review of maternal deaths occurring at this site between 2000 and 2005 indicates that 6 of the 26 deaths occurred outside of the health system/at home, and hence might have been missed by the existing notification system. This is a much higher proportion than the 2.8% reported nationally, albeit for a different time period.[6] Given that women with least access to services are likely to be those whose deaths go undetected, the factors contributing to their deaths are likely also to go undocumented – and thus fail to inform local practice. Hence, the HDSS provides an additional source of data on maternal deaths that complements national facility-based data by offering a population-based perspective. High-quality data on maternal deaths from rural areas is especially important, given that these areas have the

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highest burden of mortality and the least reliable information.[7] Health and demographic surveillance sites are able to capture this community experience effectively so that barriers to health service access, such as transport, finance and local culture, can be better understood and addressed in South Africa's rural areas.

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