

## Retinopathy

CONTINUED ON PAGE 271

### Study in Australian Aboriginals highlights the importance of identifying at-risk patients



Deborah Broadbent,  
Director of Diabetic  
Eye Screening,  
Royal Liverpool  
University Hospital

This fascinating paper from Australia provides cross-sectional data on the prevalence of diabetic retinopathy in the Aboriginal population of the Katherine region in 1993 and in 1996.

The study population were all known Aboriginal people with diabetes in a 336 000km<sup>2</sup> area of the Northern Territory. While a chronic disease register was in existence, the group had to resolve a number of unique issues to ensure that accurate and comprehensive data were collected.

Information from ethnic healthcare staff was vital in locating people who would otherwise only normally come into the community for ceremonies or medical assistance. Many people were recorded under different names in different communities with different dates of birth for cultural reasons. A team of

healthcare workers in a mobile eye unit collected data on retinopathy status after undergoing survival training!

In 1993 the group examined 87% of the known Aboriginal people with diabetes. In 1996 this figure was 88%. In 1993, 18% of patients were found to have any retinopathy and 13% maculopathy. In 1996, 21% of patients had any retinopathy and 10% maculopathy. The prevalence of vision-threatening retinopathy was estimated as 8.5% in 1993 and 6.7% in 1996, representing a significant health issue in this group.

The authors and the project should be commended for their diligence in identifying a significant health issue and the challenges it presents for the continued surveillance and treatment of this group. While the challenges in the UK are clearly different, this study highlights the fact that identification of patients at risk is just as vital.

#### CLINICAL AND EXPERIMENTAL OPHTHALMOLOGY



### Diabetic retinopathy in Aboriginal Australians

Readability	✓✓✓✓
Applicability to practice	✓✓
WOW! factor	✓✓✓✓

**1** Studies have addressed diabetes and its ophthalmic complications in Aboriginal Australians, but difficulties of researching in this area have led to biased estimates of prevalence.

**2** The Katherine Region Diabetic Retinopathy Study, carried out from 1993 to 1996 in the lower top end of the Northern Territories of Australia, investigated diabetic eye conditions and their determinants in the Aboriginal Australian population of the region.

**3** A total of 234 people with diabetes were examined in 1993, and 243 in 1996.

**4** In 1993 and 1996, the respective prevalences were 18% and 21% for retinopathy, 13% and 10% for maculopathy, 8% and 6% for clinically significant macula oedema, 0.9% and 1.3% for proliferative stage retinopathy and 8.5% and 6.7% for vision-threatening retinopathy.

**5** Prevalence of diabetic retinopathy in 1993 was 18% in four major centres compared with 16% in smaller communities; in 1996 the figures were 25% and 13% respectively.

**6** Prevalence of vision-threatening retinopathy in 1993 was 8% in four major centres compared with 7% in other communities; in 1996 the figures were 7% and 8% respectively.

**7** The problem of diabetic retinopathy in Aboriginal communities is similar to that in the wider Australian population, although the challenges presented to healthcare professionals are unique.

Jaross N, Ryan P, Newland H (2003) Prevalence of diabetic retinopathy in an Aboriginal Australian population: results from the Katherine Region Diabetic Retinopathy Study (KRDRS). Report No. 1. *Clinical and Experimental Ophthalmology* **31**: 32–9

#### DIABETIC MEDICINE



### A new non-mydratric digital camera for DR screening

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓

**1** This study compared the results of fundus photography using a non-mydratric digital camera with the results of a reference standard of Early Treatment Diabetic Retinopathy Study (ETDRS) retinal photographs for the detection of diabetic retinopathy (DR).

**2** A new Topcon non-mydratric camera was used to take fundus colour photographs of 147 eyes of 74 people with diabetes without pupillary dilation.

**3** The photographs were classified by 3 retinal specialists in a masked fashion as showing: no DR or mild non-proliferative DR (NPDR) not requiring referral; moderate or more severe

NPDR and/or macular oedema; or a non-gradable image requiring referral.

**4** For moderately severe to severe DR, the sensitivities of detection reported by the retinal specialists were 92%, 100% and 92% respectively; the specificities were 87%, 85% and 88%.

**5** For four levels of DR severity (none/mild NPDR, moderate NPDR, severe NPDR and proliferative DR) the percentages of exact agreement between the three retinal specialists on the retinopathy grades assigned to the non-mydratric photographs and to the ETDRS reference slides were 94.6%, 93% and 87.6% respectively.

**6** At least one retinal specialist judged 11% ungradable; in a second series, fewer were ungradable (<6%).

**7** Fundus photographs taken by the Topcon TRC-NW6S non-mydratric camera without pupillary dilation are suitable for DR screening.

Massin P, Erginay A, Ben Mehidi A et al (2003) Evaluation of a new non-mydratric digital camera for detection of diabetic retinopathy. *Diabetic Medicine* **20**: 635–41

CONTINUED FROM PAGE 262

## DIABETIC MEDICINE

### Two-field mydriatic digital photography

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓

**1** This study evaluated the effectiveness of non-mydriatic vs mydriatic digital photography in a community based screening programme. Sensitivities and specificities were compared to a reference standard and the value of technician direct ophthalmoscopy was assessed.

**2** Participants underwent one-field, non-mydriatic, 45° digital imaging photography prior to mydriatic two-field digital imaging photography, followed by technical ophthalmoscopy.

**3** A total of 3611 patients were enrolled in the study and the main outcome measure was detection of referable diabetic retinopathy (DR).

**4** For mydriatic digital photography sensitivity was 87.7%, specificity was 86.1% and technical failure rate was 3.7%; for non-mydriatic photography the figures were 86%, 76.7% and 19.7% respectively.

**5** Non-mydriatic digital photography has an unacceptable technical failure rate and low specificity, but two-field mydriatic digital photography is an effective way of screening for DR.

Scanlon PH, Malhotra R, Thomas G et al (2003) The effectiveness of screening for diabetic retinopathy by digital imaging photography and technician ophthalmoscopy. *Diabetic Medicine* **20**: 467–74

## BRITISH JOURNAL OF OPHTHALMOLOGY

### Utilities associated with DR in Canada

Readability	✓✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓

**1** The purpose of this study was to report Canadian patient-based utilities associated with visual loss secondary to diabetic retinopathy (DR), and compare the utility values with a sample collected in a similar manner in a tertiary care practice in the US.

## DIABETIC MEDICINE

### Automated grading of retinal images improves efficiency

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓

**1** This study compared the performances of digital retinal imaging fundus photography and slit-lamp biomicroscopy in screening for diabetic retinopathy (DR), and assessed the contribution of automated digital image analysis to a screening programme.

**2** Participants (n=586) underwent three or four mydriatic screening methods for retinal examination.

**3** The performances of digital imaging, colour slides and slit-lamp examination were evaluated against a reference standard of slit-lamp biomicroscopy by ophthalmologists.

**4** Both manual grading methods produced similar results whether using a one- or two-field protocol.

**5** Technical failure rates were lower with digital imaging; one-field grading of fundus photographs seemed as effective as two-field.

**6** Optometrists achieved the lowest sensitivities but reported no technical failures.

**7** Efficiency of resource usage in DR screening could be improved by automated grading of retinal images.

Olson JA, Strachan FM, Hipwell JH (2003) A comparative evaluation of digital imaging, retinal photography and optometrist examination in screening for diabetic retinopathy. *Diabetic Medicine* **20**: 528–34

**2** A total of 221 people with DR were interviewed (mean age 63.5 years; 48.4% were female).

**3** Canadian patients with DR were willing to trade off over 20% of their remaining lifespan to eliminate their ocular disease. The mean utility was not statistically different from that obtained from a similar sample of US patients.

Sharma S, Oliver-Fernandez A, Bakal J et al (2003) Utilities associated with diabetic retinopathy: results from a Canadian sample. *British Journal of Ophthalmology* **87**: 259–61

## EYE

### Medical treatment for DR: past, present, future

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓

**1** Recent landmark studies have confirmed: the benefits of existing hypoglycaemic and antihypertensive treatments; that good glycaemic control slows the development of diabetic retinopathy (DR); and that drugs currently used for controlling BP have clinically substantial retinoprotective effect in diabetes.

**2** The pathogenesis for the toxicity of glucose in the setting of deranged glucose control and past and present research on sorbitol is outlined.

**3** The quest for specific medical therapies to influence the course of DR has been fraught with promising agents proving ineffective and others too toxic.

**4** The implications of the DCCT and following studies, such as the UKPDS, and hypertension treatment trials are described.

**5** Cholesterol-lowering treatments are discussed in detail (particularly statins); current diabetes practice emphasises widespread use of ACE inhibitors, statins and aspirin therapies in addition to hypoglycaemic agents.

**6** Endocrine and paracrine growth factors and vascular endothelial growth factors (VEGF) are outlined.

**7** The discovery of a protein kinase C (PKC)  $\beta$  inhibitor which reduces the effects of VEGF has led to a clinical development programme.

**8** These new approaches, in addition to growth hormone antagonists new glycation inhibitors and angiotensin receptor antagonists and statins, may herald a single or multiple of new specific treatments for DR.

Donaldson M, Dodson PM (2003) Medical treatment of diabetic retinopathy. *Eye* **17**: 550–62

‘Non-mydriatic digital photography has an unacceptable technical failure rate and low specificity.’

‘Efficiency of resource usage in diabetic retinopathy screening could be improved by automated grading of retinal images.’