

Retinopathy

Grading data set in national screening for diabetic retinopathy in England and Wales



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

This paper represents a highly important step in the implementation of a National Screening Programme for Diabetic Retinopathy for England and Wales. The aim of screening is to detect disease at a stage where visual

handicap can be limited by timely laser treatment and intensive medical management.

Screening in the UK has developed on an ad hoc basis over the past 10–15 years with virtually every screening programme developing its own grading protocol. Whilst broadly similar, there has been a real need to produce a minimum data set for the purposes of central monitoring of quality assurance. The expert panel has developed a simple grading system applicable to screening, where fewer grades are required and the outcomes are restricted to annual rescreen, and routine or fast-track referral to an ophthalmology department. In addition, the protocol maps to existing research and management

systems, to the Scottish Grading System (Leese et al, 2003) and can be expanded to allow individual screening programmes to provide interval screening (the main difference between the protocol for England and Wales and the protocol in Scotland) and for the management of patients with disease in the hospital service.

The group reviewed existing evidence and available guidelines, including the guidelines produced by the National Institute for Clinical Evidence on the management of type 2 diabetes. These included recommendations for screening which have generated much debate, but failed to provide adequate definitions and came up with impractical recommendations which were not based on evidence.

While it is acknowledged that the National Screening Programme protocol may be subject to refinement in the light of new evidence in the future it marks a significant step towards the development of a tightly quality assured programme and highlights the areas in which research is required.

DIABETIC MEDICINE



New protocol for grading diabetic retinopathy

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

1 This article sets out a proposed protocol for grading and early disease management to detect sight-threatening diabetic retinopathy and any retinopathy, specifically designed for inclusion in a national guideline on screening for England and Wales.

2 The National Screening Programme will allow precise quality assurance at all steps while minimising false-positive referral to the hospital eye service.

3 Expert panel structured discussions took place between 2000–02 to review existing evidence and grading classifications.

4 The protocol includes the following principles: separate grading of retinopathy and maculopathy; minimum number of steps; compatible with central monitoring; expandable for established more complex systems and for research; no lesion counting; no 'questionable' lesions; attempt to detect focal exudative; diffuse and ischaemic maculopathy; and fast track referral from primary or secondary graders.

5 Sight-threatening diabetic retinopathy is defined and in the centrally reported minimum data set retinopathy is graded into four levels: none, background, preproliferative and proliferative.

6 The protocol represents a new consensus on which national guidelines can be based, leading to the introduction of quality-assured screening for people with diabetes.

Harding S, Greenwood R, Aldington S et al (2003) Grading and disease management in national screening for diabetic retinopathy in England and Wales. *Diabetic Medicine* **20**:965–71

DIABETIC MEDICINE



New eye screening recommendations from HTBS

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

1 The Health Technology Board Scotland (HTBS) have issued recommendations for eye screening in people with diabetes which are based on evidence-based clinical studies.

2 The rationale for the recommendations and debates behind some of the decisions are discussed in this article.

3 Conclusions have been extrapolated from the known evidence base and other factors, such as organisational issues, patient issues and cost, have been incorporated.

4 HTBS recommend single-field digital retinal photography.

5 Non-mydratic photography is recommended, followed by immediate use of dilating eye drops if it is unsuccessful, followed by slit-lamp examination if both of these approaches fail.

6 An independent grading scheme has been established, which is similar to the 'global' and compatible with the National Screening Committee grading scheme.

Leese GP, Morris AD, Olson J (2003) A national retinal screening programme for diabetes in Scotland. *Diabetic Medicine* **20**: 962–64

DIABETES/METABOLISM RESEARCH AND REVIEWS

More research is needed into hyperlipidaemia

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

- 1 This review article questions the belief that protein kinase C (PKC) stimulation in diabetes is solely mediated through the overproduction of palmitate and oleate enriched diacylglycerols.
- 2 Blood glucose concentrations are closely tracked by changes in the levels of free fatty acids and these may account for the aberrant activation of PKCs in diabetes (in addition to oxidative stress).
- 3 Evidence implicates the PKC β isoform in the pathogenesis of diabetic retinopathy, but other isoforms may also be relevant. Novel diacylglycerol-activated non-kinase receptors could play a role in diabetes complications.
- 4 Therapeutic agents to inhibit PKC isoforms have been developed and PKC β antagonists are undergoing clinical trials.

Curtis TM, Scholfield CN (2004) The role of lipids and protein kinase Cs in the pathogenesis of diabetic retinopathy. *Diabetes/Metabolism Research and Reviews* 20: 28–43

DIABETIC MEDICINE

Teenage years have adverse effect on complications

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

- 1 This study aimed to quantify the influence of childhood onset type 1 diabetes on long-term retinal and renal outcomes.
- 2 A population-based diabetes register was used to identify all type 1 patients diagnosed before the age of 15 years in a catchment area. People diagnosed before 5 years, 5–9 years

ARCHIVES OF OPHTHALMOLOGY

The impact of diabetic retinopathy on daily life

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

- 1 The objective of this study was to determine the restriction of participation in daily activities of people with diabetic retinopathy.
- 2 A total of 45 people with diabetic retinopathy and a visual acuity (VA) worse than 20/40 or 6/12 in the better eye answered demographic questions, had VA information abstracted from medical records and completed the Impact of Visual Impairment questionnaire.
- 3 The highest restriction was reported for the leisure and work, mobility and consumer and social interaction domains, compared with the emotional reaction to visual loss and household and personal care domains.
- 4 The activities with the greatest restriction of participation were reading print, mobility, work and leisure.

Lamoureux EL, Hassell JB, Keeffe JE (2004) The impact of diabetic retinopathy on participation in daily living. *Archives of Ophthalmology* 122: 84–88

and 10–14 years were compared with people diagnosed aged 21–25 years.

- 3 Proteinuria occurred earlier, nephropathy outcome was worse and the risk of developing microalbuminuria was greater in childhood-onset diabetes compared with the adult-onset controls.
- 4 The number developing background retinopathy did not differ with age at onset, but younger onset patients were more likely to need laser treatment.
- 5 Events in adolescence appear to have a major adverse effect on the risk of developing long-term microvascular complications.

Harvey JN, Allgoa B (2003) The long-term renal and retinal outcome of childhood-onset type 1 diabetes. *Diabetic Medicine* 21: 26–31

ARCHIVES OF OPHTHALMOLOGY

Retinal vessel calibre and diabetic retinopathy

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

- 1 This study aimed to investigate the relationship of retinal arteriolar and venular calibre to the incidence and progression of diabetic retinopathy in people with type 1 diabetes.
- 2 Participants comprised 996 people diagnosed with diabetes before the age of 30 years who took insulin and underwent the baseline examination; 891 in the 4-year follow-up, 765 in the 10-year follow-up and 634 in the 14-year follow-up.
- 3 The main outcome measures were incidence and progression of retinopathy, incidence of proliferative retinopathy and macular oedema.
- 4 Larger arteriolar and venular diameters were associated with greater 4-year progression of retinopathy. Larger venular diameters, but not arteriolar diameters were associated with greater 4-year incidence of proliferative retinopathy.

Arteriolar and venular calibres were not associated with the 4-year incidence of retinopathy in multivariate analyses.

- 6 Arteriolar and venular calibres were not associated with incidence of macular oedema at 4 years when other factors were adjusted for, and there were few associations of arteriolar or venular calibre with the 10- or 14-year incidence of the progression of retinopathy.
- 7 Larger arteriolar and venular calibre is related to the progression of retinopathy, and larger venular calibre is associated with the 4-year incidence of proliferative retinopathy. Calibre of retinal vessels is not associated with incident retinopathy.

Klein R, Klein B, Moss SE et al (2004) The relation of retinal vessel caliber to the incidence and progression of diabetic retinopathy. *Archives of Ophthalmology* 122: 76–83

‘Evidence implicates the PKC β isoform in the pathogenesis of diabetic retinopathy, but other isoforms may also be relevant.’

‘Events in adolescence appear to have a major adverse effect on the risk of developing long-term complications.’