Improving retinopathy screening – are we meeting the NSF target?

Karen Turner and Charles Bodmer

Introduction

The National Service Framework (NSF) for diabetes delivery strategy has set a target for 80% of people with diabetes to be offered screening for diabetic retinopathy by 2006, rising to 100% by the end of 2007. What is not clear is how these targets are to be measured. This article describes an audit of patients with diabetes at Colchester General Hospital. The aim was to assess how the diabetes team is currently meeting the NSF target for retinopathy screening. The team hoped to use the information to improve the education, support and screening offered to people with diabetes.

Diabetic retinopathy is the leading cause of blindness in the UK in people of working age (Evans, 1991). The rising prevalence of diabetic retinopathy is a major health and economic problem in the UK. In the fight against this devastating complication of diabetes, the importance of early screening and treatment of retinopathy should not be underestimated. Once the person with diabetes notices a visual problem it is often too late to prevent blindness.

This article explores, through audit, how we are meeting the *National Service Framework (NSF) for Diabetes: Delivery Strategy* (Department of Health [DoH], 2003) standard for diabetes eye screening in our area. The audit gathered evidence on the effectiveness of the diabetic retinopathy screening programme in Colchester, and looked at how many patients were accurately recorded on the diabetes register as having their eyes screened.

We hope to be able to use the information obtained from the audit to improve the education, support and screening we offer to patients by implementing changes in practice.

Retinopathy screening in the UK

The *NSF for Diabetes: Delivery Strategy*, launched in January 2003, set a target for all people with diabetes to have access to diabetic retinopathy screening services by 2007. An interim target is for 80% of people with diabetes to be offered retinopathy screening services by 2006. The National Institute for Clinical Excellence (NICE) (2003) retinopathy guideline sets the standard for people with type 2 diabetes as:

> ***'Examine the eyes of people with type 2 diabetes at the time of diagnosis and at least annually thereafter.'***

The Advisory Panel Final Report to the UK National Screening Committee (2000) recommended that 'all diabetic patients have annual examinations of the retina'.

Grimshaw et al (1999) found that the proportion of people with known diabetes screened in a year ranged from 38% to 85% across districts, and from 14% to 97% across GP practices. Untreated, 6–9% of people with proliferative retinopathy or severe non-proliferative disease would become blind each year (National Screening Council, 2000).

What is not clear is how the NSF targets are to be measured. People with diabetes may be supported by primary care, secondary care or, in some cases, both. The dilemma is where to keep the records of retinopathy screening, in order to create a sound database for assessment of these targets and improvement in services.

Retinopathy

One of the most important clinical features of diabetes is its association with chronic complications affecting the tissues. These generally develop after several years of diabetes, hence signs of retinopathy are not

ARTICLE POINTS

1 Diabetic retinopathy is the leading cause of blindness in the UK in people of working age.

2 An interim NSF target is for 80% of people with diabetes to be offered retinopathy screening by 2006.

3 A key issue in assessing how we were meeting the NSF targets for retinopathy screening was inaccessibility of data.

4 Audit identified a gap in the diabetic eye screening process, which was addressed by agreeing actions with secondary healthcare professionals.

5 Knowing the interval between eye screens enables practitioners to make a better assessment of the screening support required and to target those not attending regularly for screening.

KEY WORDS

- **Diabetic retinopathy**
- **Eye screening**
- **Audit**
- **NSF targets**

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PAGE POINTS

1 Regular eye screening, together with timely referral for treatment, should prevent most cases of serious visual impairment.

2 Screening and treatment for diabetic retinopathy will not eliminate all cases of sight loss, but can play an important part in minimising the numbers of patients with sight loss due to retinopathy.

3 Preventing or delaying the progression of diabetic retinopathy by good control of blood glucose, blood pressure and lipid levels is also paramount.

4 The main objectives of the audit were to look at how the diabetes team is currently meeting the NSF target for retinopathy screening and to implement and critically evaluate changes in clinical practice.

usually seen for the first five years after diagnosis in people with type 1 diabetes. A particular issue for people with type 2 diabetes is that their diabetes is not usually diagnosed until at least four to seven years after the onset of the disease (Harris et al, 1992). This can result in these patients having a degree of microvascular complications at diagnosis, which is probably related to the duration and severity of hyperglycaemia.

Hyperglycaemia causes thickening of the basement membrane of the retinal vascular cells, resulting in blocked or leaking vessels, leading to occlusion or oedema. When the blood vessels leak, lipids are deposited on the retina forming hard exudates. Damaged blood vessels may develop microaneurysms, leading to blot haemorrhages. As the haemorrhages increase, macular oedema can result, leading to loss of vision. These changes can occur as a result of poor glycaemic control and be accelerated by risk factors such as hypertension, hypercholesterolaemia and cigarette smoking.

Retinopathy can present differently in type 1 and type 2 diabetes. The retinal changes in people with type 1 diabetes usually develop in stages (Fox and Pickering, 1995), although some individuals do not progress beyond background diabetic retinopathy.

The retinal signs of diabetic retinopathy are shown in *Table 1*.

The retinal changes in people with type 2 diabetes often occur around the macula and can cause a small reduction in visual acuity before the person becomes aware of it. These patients should be referred to an ophthalmologist for laser treatment. The UK Prospective Diabetes Study (UKPDS) has given us valuable information on the prevalence of retinal disease in people with type 2 diabetes (Kohner et al, 1999; *Table 2*).

Table 1. Retinal signs of diabetic retinopathy

Classification of retinopathy	Signs
Background	Haemorrhages Microaneurysms Exudates
Pre-proliferative	Cotton-wool spots Venous beading and looping Intraretinal microvascular anomalies
Proliferative	New vessels Fibrovascular proliferation

Table 2. Proportion of patients with retinopathy identified by Kohner et al (1999)

At diagnosis	18%
3 years	26%
6 years	34%
9 years	40%
12 years	53%

Lewin and Seymour (1992) suggested that:

'Regular eye screening together with timely referral for treatment should prevent most cases of serious visual impairment.'

while the NICE retinopathy guidelines (2002) state that:

'Screening and treatment for diabetic retinopathy will not eliminate all cases of sight loss, but can play an important part in minimising the numbers of patients with sight loss due to retinopathy.'

However, preventing or delaying the progression of diabetic retinopathy by good control of blood glucose, blood pressure and lipid levels is also paramount.

Audit

In July 2003 we undertook an audit of 70 people with diabetes. Their details were extracted from the diabetes register in the Colchester area. The main objectives of the audit were to look at how the diabetes team is currently meeting the NSF target and to implement and critically evaluate changes in clinical practice.

The ophthalmic team at the hospital and ophthalmic opticians provide treatment and eye screening respectively. This is supported by educational material from the diabetes team so that people with diabetes understand the relationship between diabetes control and the risk to their eyes.

Results of the audit

The results of the audit were initially encouraging. Of the 70 people with diabetes audited, 64 (91%) were either in the local screening scheme (41) or being

seen at the hospital eye clinic (23) (*Figure 1*). Those being seen at the hospital eye clinic are receiving active treatment and regular assessment. Overall this exceeds the NSF delivery strategy target of 80% being offered screening by 2006.

By checking patients' notes, we ascertained that 54% of the patients had no complications (*Figure 2*), which is generally in line with the UKPDS findings (Kohner et al, 1999). The main issue is that 9% of the audited patients had nothing recorded regarding retinopathy screening in the diabetes register or in their medical notes.

Of the 35 people with type 2 diabetes in the audit, four (11%) appear never to have been screened. In addition, the medical notes of 11 (16%) of the 70 people in the audit indicate they are being seen at the hospital but no complication or reason is recorded on the diabetes register.

With regard to the screening interval, 23 (56%) of the 41 people with diabetes in the screening programme were reviewed at 15 months or less. The average review period on follow-up was 17.2 months (range 6–39 months).

Of the 23 patients being seen at the hospital, 21 (91%) were followed-up at 12 months or less, with an average review period of 6.1 months. Of the 23 being seen at the hospital, only two (9%) were not reviewed within 12 months.

Of the remaining eight patients, the GP surgeries contacted reported that two were being screened (no review period available) and six were not being screened.

Overall, 44 (63%) patients were being reviewed at 15 months or less. This does not meet the recommendations of the National Screening Council (2000).

A key issue identified by this audit was the difficulty in accessing data to assess whether we were meeting the NSF guidelines for diabetic retinopathy screening and whom to target for screening.

While the diabetes register captured people with diabetes in the local eye-screening scheme, it did not record patients being seen at the hospital or those reviewed by optometrists whose reports go directly to the GP, i.e. non-scheme optometrists. The audit revealed that 33% are being seen at the hospital eye clinic, but this is not obvious to the diabetes team unless they review everybody's notes – a costly and time-consuming exercise. Currently the only way to check whether patients are being seen at the hospital is to retrospectively check their notes.

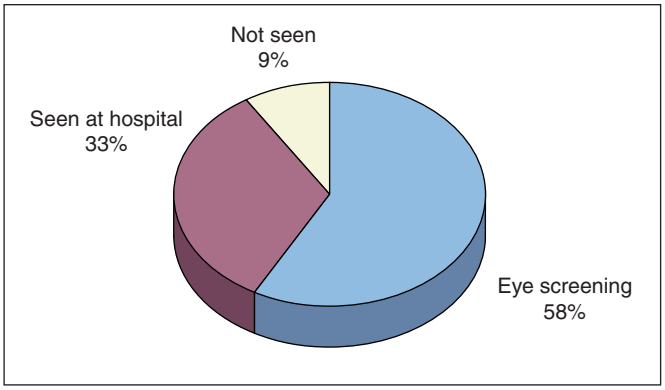

Figure 1. Results of audit of eye assessment.

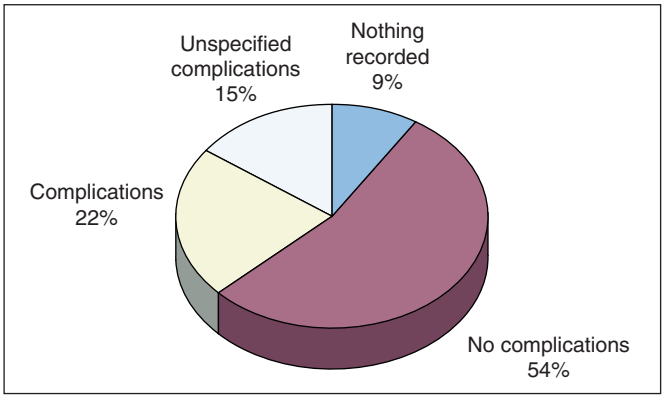

Figure 2. Results of audit of eye complications.

The other issue identified is the screening interval. Only 53% of those screened are reviewed annually. This rises to 59% screened up to 15 months and 67% up to 18 months.

Recommendations for improving practice

As a result of the audit, recommendations for improving clinical practice were made:

1. When patients are reviewed in the diabetes clinic, ensure that they are given an eye screening leaflet listing opticians in the scheme.
2. When patients are reviewed in the clinic, check their attendance and period between follow-ups for eye screening.
3. Investigate methods of recording patients who are being seen at the hospital eye clinic on the diabetes register.
4. Request GP surgeries to copy non-screening opticians' reports to the hospital.

Once these recommendations are fully implemented, the primary and secondary

Table 3. Actions agreed by the primary and secondary care diabetes teams with regard to eye screening of people with diabetes

1. Use a diabetes register form to record patients' attendance at the hospital eye clinic
2. Diabetes register form to be completed by the eye clinic nurse and: a. Inserted into the patient's notes b. Sent to diabetes register secretary for recording in diabetes register
3. Eye screening forms to be changed to include: a. Name of the optometrist seen b. Date of last appointment This will become a patient-held record
4. Write to GPs asking them to fax through non-screening optometrist reports to the hospital This is also an opportunity to remind surgeries of the diabetes eye-screening scheme run locally
5. Ensure that people with diabetes are reminded of the importance of eye screening when they come to the clinic This is also an opportunity for the DSN to record the name of the patient's optometrist and the date of his/her last visit in the medical notes

DoH (2003) *National Service Framework for Diabetes: Delivery Strategy*. http://www.publications.doh.gov.uk/nsf/diabetes/delivery/ch3/retinopathy.htm

DoH (2003) *NSF National Service Framework for Diabetes: Standards*. Intervention details. http://www.publications.doh.gov.uk/nsf/diabetes/ch2/complications.htm 15 June 2003

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Grimshaw GM, Baker R, Wilson AD, Thompson JR, Atkinson M (1999) *Report of the Inter-College Audit of Diabetic Retinopathy Screening*. Leicester University

Harris MI, Klein R, Welborn TA, Knuiman MW (1992) Onset of NIDDM occurs at least 4–7 years before clinical diagnosis. *Diabetes Care* **15**: 815–19

Kohner EM, Stratton IM, Adlington SJ, Turner RC (1999) Microaneurysms in the development of diabetic retinopathy (UKPDS 42). *Diabetologia* **42**: 1107–12

Lewin I, Seymour C (1992) *Current Themes in Diabetes Care*. Royal College of Physicians, London

National Screening Council (2000) *Advisory Panel Final Report to the UK National Screening Committee* http://www.diabetic-retinopathy.screening.nhs.uk/recommendations.html#annex-3 (accessed 30 August 2004)

National Institute for Clinical Excellence (NICE) (2002) *Management of Type 2 Diabetes. Retinopathy – Early Management and Screening*. Inherited Clinical Guideline E. NICE, London

care teams will be able to use the diabetes register to target (for screening) those people with diabetes who have not been screened and are not being seen by the hospital ophthalmologist.

By knowing the interval between eye screens, practitioners can make a better assessment of the screening support required by people with diabetes. We can also target those patients who are not attending for screening on a regular basis.

Change in practice

Locally, we have agreed to record all forms of patients' eye screening on the diabetes register, not just those seen in the screening scheme. In order to achieve this, the actions shown in *Table 3* were agreed in December 2003.

In addition to these actions, eye-screening leaflets will be distributed to people with diabetes discharged from the hospital eye clinic following treatment, to ensure that they are aware of the optometrists in the screening scheme.

The project proposals were presented to and accepted by the following groups:

1. hospital ophthalmic team:
   a. consultant ophthalmologist
   b. registrars and senior house officers
   c. hospital optometrist
   d. ophthalmic ward nursing staff
2. eye clinic outpatient nursing staff
3. diabetes register administration staff
4. consultant diabetologist
5. diabetes specialist nurses.

At this stage the outcomes of the project cannot be fully evaluated, as 12 months need to elapse before the audit can be repeated. Currently, all people with diabetes seen at the hospital eye clinic are recorded in the diabetes register.

Conclusion

The audit clearly demonstrated a gap in the diabetes eye screening process – namely that the diabetes team could not easily identify patients who were not being screened and target them for further action. A small percentage of the population (9%) appear never to have been screened.

By implementing changes in practice, and involving other members of the multidisciplinary team, we are now able to add people with diabetes attending the diabetes eye clinic to the diabetes register.

Overall we are well on the way to meeting the NSF targets for retinopathy screening. With full implementation of the recommendations agreed from the audit findings, we will be able to ensure that retinopathy screening is available to all people with diabetes in our area. We will also be able to provide auditable evidence as to whether we are meeting the NSF targets. ■

ACKNOWLEDGMENTS: We would like to thank Dr Paula Gormley, Consultant Ophthalmologist, the Ophthalmic team at Essex County Hospital, and the diabetes team at Colchester General Hospital, for their support in this audit and help in implementing the recommendations.