Access to a local Digital Diabetic Retinopathy Screening Service

Abstract

**Background:** Diabetic retinopathy is the second most frequent cause of registerable blindness in the working-age population in the UK. Despite the implementation of the NHS Diabetic Eye Screening Programme in England and Wales, many patients with diabetes continue to become sight impaired.

**Aim:** The purpose of this study was to better understand the impact of a Digital Diabetic Retinopathy Screening Service (DDRSS) provided to residents of Walsall in the West Midlands, UK.

**Methods:** An analysis of data from the UK National Diabetes Audit and a plot of the location of DDRSS providers against a ‘heat map’ of the resident population density of those aged 60 years and over in Walsall provided a gauge of the impact of the service, including accessibility to and reach of the service.

**Results:** DDRSS providers were not necessarily located in residential areas of older people, nor within a 15-minute walking distance for a significant proportion of residents. The DRRS pathway extensively involves community optometrists but appears to under-deliver in meeting the key performance indicators of the service.

**Conclusions:** There is a need to better understand the barriers to the uptake of the DRRSS in Walsall. The feasibility of a mobile DRRSS service is also being considered so that the areas not within easy access of residents can be provided with the screening service. Further consideration should be given to the provision of the service to patients in their homes, and in residential homes and day-care centres.

**Nizar K Hirji,**
optometrist consultant, Hirji Associates, Birmingham, UK; and visiting research fellow, Academic Unit of Public Health, Faculty of Medicine and Health Sciences, University of Leeds, UK

**Paulette Myers,**
consultant in public health medicine; and associate director of public health, Public Health Walsall Council, Walsall, UK

Diabetic retinopathy is the second most frequent cause of registerable blindness in the working-age population in the UK, having been overtaken by hereditary retinal disorders (Liew et al, 2014). This may be partly attributable to the introduction of the nationwide NHS Diabetic Eye Screening Programme (NDSEP) in England and Wales (NHS Choices, 2013); all patients with diabetes aged 12 years and over are now offered retinopathy screening. The screening involves capturing digital photographs of two nominal 45° fields (1x fovea-centred, 1x disc-centred) per eye of the retina through dilated pupils. This is followed by a systematic image grading process, and the results are sent to individuals and their GPs.

The scheme protocol, initially developed by the Diabetic Retinopathy Grading and Disease Management Working Party, forms the basis for the national guidelines for screening people with diabetes (Harding et al, 2003). In the procedure, retinopathy is graded into four levels:

1. None (R0)
2. Background (R1)
3. Preproliferative (R2)
4. Proliferative (R3); this is subdivided into Active Proliferative Retinopathy (R3A) and Stable Treated Proliferative Retinopathy (R3S).

Maculopathy and photocoagulation are graded as absent (M0, P0) or present (M1, P1), and photographs that are not gradable as (U). This grading is revised as required to ensure that each patient is processed accurately, and classified into the correct grading and referral pathway (NHS Screening Programmes, 2012).

Early detection of diabetic retinopathy and its treatment, where appropriate, is critical in reducing the risk of sight loss. Because of this, the Department of Health (2002) set an ambitious target of 100% screening for diabetic retinopathy of those diagnosed with diabetes by 2007. There are currently three key performance indicators (KPIs) for diabetic eye screening, which relate to the service objectives and quality assurance standards of the NDSEP. They are (NHS Screening Programmes, 2014):

- Uptake of screening—acceptable level ≥70%; achievable level ≥80%
- Results issued within three weeks of screening—acceptable level ≥70%; achievable level ≥95%
- Timely consultation for R3 screen positive result (consultation within four weeks of notification of positive test)—acceptable level ≥80%

The data from 151 primary care trusts show considerable regional variation for uptake (NHS Screening Programmes, 2013). The proportion of people with diabetes excluded from screening ranged from 1.1–22.8%, and the coverage of screening (the proportion of people identified with diabetes who received a screening test) varied from 52–95%.

Early detection of diabetic retinopathy and its treatment can halve the risk of sight loss. According to Diabetes.co.uk (2014), it is estimated that there are 4200 people in England who are severely sight impaired (blind) due to diabetic retinopathy; this figure increases by an average of 1280 each year. People with diabetes are 10–20 times more likely to become severely sight impaired than people without diabetes, and within 20 years of diagnosis, nearly all people with type 1 and almost two thirds of people with type 2 diabetes (60%) have some degree of retinopathy (Diabetes.co.uk, 2014). Additionally, people with diabetes are twice...
as likely to suffer from cataracts or glaucoma than the general population (Diabetes.co.uk, 2014). It should be noted that Asian and Black populations have a greater risk of developing diabetic eye disease compared with the white population (Das et al, 1994; Kempen et al, 2004). Retinopathy occurs approximately 12 years earlier in South Asians compared with a Caucasian sample (Pardhan et al, 2004). The Royal National Institute of Blind People (RNIB) suggests an approximately 35% increased risk of visual impairment in Asians compared with Caucasians from the UK due to diabetic disease (Minassian and Reidy, 2009).

**Aim**

The purpose of this initiative was to establish the effectiveness of a Digital Diabetic Retinopathy Screening Service (DDRSS) in Walsall, UK.

**Methods**

**Sample**

Of the nine National Institute for Health and Care Excellence recommended care processes for patients with diabetes, screening for diabetic retinopathy is one (NHS Screening Programmes, 2013). Age, ethnicity and obesity are recognised risk factors for diabetes. Walsall has an ageing, ethnically mixed population (19.5% of the resident population are from ethnic minority groups); people of Indian, Pakistani and Bangladeshi backgrounds form the largest minority ethnic groups in Walsall (Walsall Council, 2013).

Obesity is a significant public health challenge in Walsall and it is estimated that about 55 000 adults (26%) are obese and 130 000 (62%) are overweight or obese (Health and Social Care Information Centre (HSCIC), 2009). Childhood obesity rates for Year six (10- and 11-year-olds) are increasing in Walsall, and are higher than the peer group West Midlands and England average (HSCIC, 2014). The RNIB estimates that there are 5080 people living with diabetic retinopathy in Walsall (Minassian and Reidy, 2009).

**Procedure**

An analysis of the data available on DDRSS from the National Diabetes Audit for Walsall Clinical Commissioning Group for 14 quarters, from Q3 2009/10 to Q4 2012/13, was conducted. Additionally, the locations of accredited DDRSS providers in Walsall were plotted on a ‘heat map’ of the resident population density of those aged 60 years and over to gauge the coverage and accessibility of the service (Figure 1).

**Results**

Figure 1 illustrates the service coverage of DDRSS providers for older people in Walsall, where a substantial number of the population live further than the 800-metre attendance attenuation threshold found by Simmons (2009). The areas circled in...
**Research**

*Figure 1* indicate a 15-minute (i.e. 800-metre) walking radius to the optometric practice. Not enough DDRSS providers are located in the East of the Borough, outside the inner ring road, where the majority of the older population live, and considerable areas are not within a 15-minute walking distance to the optometric practice.

According to the 2011/12 *National Diabetes Audit*, there are 16,536 people with diabetes in Walsall (HSCIC, 2013). This would require that about 1,650 patients per accredited DDRSS practice per annum will need to be screened for retinopathy. Many of the optometric practices that are accredited to provide DDRSS are part-time practices. The DDRSS-accredited practices in Walsall screen an average of 1,150 patients per practice, leaving a significant shortfall every year. There was a 67.6% (Q4 2012/13) performance level for digital diabetic retinopathy screening (HSCIC, 2013) (*Figure 2*).

Relative to other primary care trusts, this places NHS Walsall towards the bottom (fourth quintile) nationally for this issue (NHS Right Care, 2011).

**Discussion**

The provision of DDRSS in Walsall up to Q4 2012/13 was unsatisfactory, and *Figure 2* illustrates that this has been the case for this service for a significant period of time, save for Q1 2010/11. Digital diabetic retinopathy screening in Walsall is conducted as part of the NDESP at ten accredited sites, which in 2012/13 supplied retinal photographs of 11,512 patients for grading. There are two accredited sites next to each other in Willenhall, with none in Darlaston, Streetly or Pheasey. It is apparent that more DDRSS-accredited practices located in East Walsall would improve accessibility. The DDRSS pathway already extensively involves community optometrists, but appears to under-deliver in meeting the acceptable level of uptake of screening (≥70%) for people with diabetes in Walsall, and falls far short of the achievable level of the ≥80% target.

The DDRSS service provision contract in Walsall was re-awarded in spring 2014 to the same provider as previously. By all accounts, the service provided in the past, and which has been re-commissioned for the coming year, follows the recommended operational and clinical guidance set out by the NDESP. Based on the current study, the service does not have sufficient ‘reach’ into the diabetic population of Walsall.

**Going forward**

As a result of the findings of this initiative, a number of recommendations have emerged, which are listed below:

- The need to work with focus groups to better understand the barriers to the uptake of the DDRSS in Walsall
  - This may require commissioners to include specific requirements in a capability contract with milestones
  - A review of all contact reminder and recall methods and materials in order to consider whether there are alternative approaches to reaching patients at risk
- The need to embark on an effective social marketing programme to promote DDRSS in Walsall
- Consideration to be given to introducing further locations for DDRSS at Streetly, Pheasey and Darlaston, and a review of the merit of having two DDRSS service providers in Willenhall vs the need to cover a greater catchment area of Walsall
- The feasibility of a mobile DDRSS service for Walsall so that areas not within easy access could be provided with the screening service
- There is currently no service available to patients who are housebound and unable to attend the DDRSS provider locations. Serious considerations should be given to the provision of the service to patients in their homes, and in residential homes and day-care centres.

*Figure 2. Percentage of known people with diabetes having digital diabetic retinopathy screening*

From: Health and Social Care Information Centre, 2013
Acknowledgment: Figure 1 is reproduced with permission from David Hughes, Public Health Intelligence Analyst, Public Health Walsall.

Conflict of interest: none.


Key points

• Despite the NHS Diabetic Eye Screening Programme (NEDSP) in England and Wales, many people with diabetes continue to become sight impaired

• Digital Diabetic Retinopathy Screening Service (DDRSS) providers in Walsall were not necessarily located in the residential areas of older people, nor within a 15-minute walking distance for a significant proportion of residents

• Based on this study, the DDRSS pathway extensively involves community optometrists but appears to under-deliver in meeting the acceptable key performance indicators of the NEDSP.

• Digital diabetic retinopathy screening • Access