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Public Health

journal homepage: www.elsevier.com/puhe

Original Research

Equity of uptake of a diabetic retinopathy screening programme in a geographically and socio-economically diverse population

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ARTICLE INFO

Article history:
Received 16 May 2012
Received in revised form
19 December 2012
Accepted 13 April 2013
Available online 22 August 2013

Keywords:
Retinopathy
Screening
Diabetes

SUMMARY

Objectives: At the time of undertaking the audit, the uptake of diabetic retinopathy screening in Derbyshire was 73%, below the national standard of 80%. To assess equity of access to diabetic retinopathy screening in a geographically and ethnically diverse population and determine predictors for poor uptake that will inform service improvements.
Study design: Mixed methods health equity audit.
Methods: Postal questionnaires were issued to 1000 people invited for diabetic retinopathy screening in May 2010 and telephone interviews were conducted with subsample of 32 people who had not made a screening appointment. Routine data from the screening programme was used to identify characteristics of people who did not respond to screening invitation. The adjusted odds ratios (OR) and 95% confidence intervals (95% CI) using multivariate methods were calculated in this study.
Results: The response rate to the postal questionnaire was 43%. Of these, 28% of respondents did not recall discussing the importance of diabetic retinopathy screening with their primary care team and 11% of people did not understand the term 'diabetic retinopathy'. Non-uptake of screening was associated with deprivation (OR 1.19, 95% CI 1.10–1.29 for those living in the most deprived areas compared to the least deprived) and young people were over three times more likely not to participate than older people (OR 3.13, 95% CI 2.70–3.64 for men under 40 compared to men over 80 and OR 3.03, 95% CI 1.54–5.98 for people with type 1 diabetes under 40 compared to those over 80).
Conclusions: Ensuring that primary care and other health care and third sector organisations convey the importance of diabetic retinopathy screening with patients and improving patients' understanding of the screening programme may improve uptake. Interventions to increase uptake should be targeted to younger people, especially those with type 1 diabetes and people living in more deprived areas.

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0033-3506/$ – see front matter © 2013 Published by Elsevier Ltd on behalf of The Royal Society for Public Health.
http://dx.doi.org/10.1016/j.puhe.2013.04.015

Introduction

Globally more than 366 million adults are living with diabetes and that this will rise to over 522 million by 2030.[1] People with diabetes are at risk of developing macrovascular complications such as coronary heart disease and microvascular complications such as diabetic retinopathy (DR). Diabetic retinopathy causes changes in the blood vessels of the retina that can lead to blindness and is one of the leading causes of blindness in working-age people in England and Wales.[2] The prevalence of DR is strongly associated with the duration of diabetes and it is estimated that nearly all patients with type 1 diabetes and approximately 60% of patients with type 2 diabetes will have some degree of DR 15–20 years after diagnosis.[3,4] As the disease progresses it impacts upon the quality of life of patients and makes the disease and any co-morbid illnesses difficult to manage.[5–7] Screening tests for diabetic retinopathy can detect changes in the retina before symptoms commence and early laser treatment can then be given at an appropriate stage to slow the progression of the disease and to reduce the risk of moderate and severe visual loss by up to 50%.[8,9]

Screening for DR has been shown to be cost[10] and clinically[11] effective at the population level and is now offered (free of charge) to all eligible people with diabetes in the UK.[12] In England it is expected that local programmes will screen at least 80% of their eligible population annually as set out in national quality standards. However a 2011 report from the UK National Screening Committee on the performance of DR screening in England in 2009/10 showed that uptake of DR screening was below this.[13] Whilst ensuring high uptake continues to present a challenge, currently little is known about the predictors for DR screening uptake.

At the time of the audit the uptake of DR screening in Derbyshire was 73%. However the programme in Derbyshire includes residents of Derby City and Derbyshire County. Both areas are extremely diverse in terms of the geography that they cover and population demographics; Derbyshire County covers a population of 760,000 with just under 5% black and minority ethnic residents, whilst Derby City covers a population of 244,000 with nearly 12% black and minority ethnic residents. Its geography includes rural National Park areas, a dense inner city conurbation and one district in the most deprived quintile of the UK. At the time of the analysis, screening was delivered in 12 fixed sites: two sites in the city and ten sites in the county.

A mixed-methods approach was used to assess the equity of screening uptake in Derbyshire and to identify potential barriers to service access. To do this a postal survey of 1000 patients with diabetes, supplemented with short telephone interviews with people who did not attend their screening appointment was conducted. In addition, the routinely-collected data from the Derbyshire Diabetic Retinopathy Screening Programme was used to identify the characteristics of people who were less likely to take up their offer of DR screen.

Methods

Study design, setting and participants

1000 postal questionnaires were sent to a stratified sample of patients who had been invited for screening between 1st and 31st May 2010. The stratifications were district of residence, gender and age and the size of each stratum was proportionate to the population who did not respond to the screen in the previous year with the exception of type of diabetes; all patients with a record of type 1 diabetes ($n = 148$) were invited and the remainder were either people with type 2 diabetes ($n = 809$) or people with unknown type of diabetes ($n = 43$).

Demographic information was collected to assess how representative the responses were. In the questionnaire, patients were asked about their most recent contact with the screening programme. This included questions about the ease of booking an appointment, experiences with staff and the screening clinic, the quality of the information (verbal and written) and views about potential changes to the local service.

From this sample of 1000 patients, the authors attempted to conduct telephone interviews with 50 patients selected at random who had been invited to make a screening appointment but had not done so within six months following invitation. In total, 32 interviews were conducted and were structured based on the questions in the postal questionnaire.

In addition to the survey and telephone interviews, prospectively collected routine data from the Derbyshire DR screening database were used to assess access to the screening programme. The population consisted of a closed cohort of people with diabetes aged over 12 years that had been invited for DR screening between January 2009 and July 2010. Where people had been invited twice in the time period, only the time of the first invitation were looked at. The characteristics of the people who did (responders) and who did not (non-responders) make an appointment for screening within six months of invitation were described. If individuals made an appointment for screening more than six months after invitation they were classed as non-responders because the target time for screening had elapsed.[14] The characteristics of people who were assessed were selected because they had been identified in previous studies as potential independent risk factors for poor screening uptake[15–17] and were routinely available in the database. They were: age at the time of invitation, gender, type of diabetes and level of deprivation. Patients were grouped into the following age categories: under 40, 40–49, 50–59, 60–69, 70–79 and 80 and over. The Index of Multiple Deprivation (IMD 2007) score assigned to the GP practice that the patient was registered with, split into quintiles was used to measure deprivation.

Statistical analysis of the routine data

Characteristics of responders and non-responders were described using frequencies and percentages. Logistic regression was used to estimate univariable and multivariable