Diabetic retinopathy screening: does one size fit all?

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Health policy is constantly striving to release capacity in overstretched health services, or to improve effectiveness, efficiency and patient experience, while maintaining clinical safety. However, policy implementation may also introduce unintended consequences. This is elegantly highlighted in the paper by Olvera-Barrios *et al*[1] reporting a large retrospective study on the differential impact of extended diabetic eye screening intervals among persons with diabetes, considered to be at low risk of sight loss.

Understanding disparities in health (inequalities and variations in healthcare) and addressing their underlying factors remains a constant challenge with competing priorities for limited healthcare capacity and resources. Diabetes is no exception. Its prevalence is increasing globally[2] and in the UK,[3] it is higher among some ethnic communities.[4–8] There is growing evidence on the variation in risk of developing significant sight threatening diabetic retinopathy (STDR) by ethnicity and age in UK populations[9 10] and elsewhere.[11 12] The findings reported by Olvera-Barrios *et al* make an important contribution to this body of evidence. Consistent with previous studies, they report significantly increased risk of developing STDR among black and South Asian ethnic groups[9–12] and in the younger age groups.[13 14]

THE NHS DIABETIC EYE SCREENING PROGRAMME

The aim of the National health Service (NHS) diabetic eye screening programme (DESP) is for early detection of STDR for timely onward management.[15] DESP is integral to the annual NHS care processes for diabetes,[16] for the management of diabetic retinopathy and prevention of significant sight loss. DESP has well-established, broadly similar governance processes and quality standards[17] in each of the UK nations, which are monitored through the submission of quarterly and annual reports at the local and national levels. Key performance indicators include uptake of screening (the proportion of those offered routine digital screening who attend), and the proportion of urgent referrals (screen-positive subjects with proliferative retinopathy) and routine referrals (those with preproliferative retinopathy or maculopathy) who are seen by the hospital eye service within 6 weeks or 13 weeks, respectively.[17]

VARIATION AND INEQUALITIES

Variation and inequality in both screening uptake and meeting urgent referral targets is well established among health screening programmes in the UK and more widely.[18] In England, in recent years overall screening uptake at the national level has met standards, but those for timely assessment of urgent and routine screen-positive referrals have not.[19–21] At the same time these are associated with significant geographical variations in the order of 1.8-fold, 2.8-fold and 5.8-fold, respectively,[22] which remain unrecognised by the current routine reporting and monitoring arrangements of DESP performance.

These variations may in part be attributed to poorer uptake of screening among younger age groups (who are more likely to have the greatest benefit from screening over their life course);[23] as well as factors such as social deprivation, ethnicity and duration of diabetes;[23] with continuing capacity pressures in the hospital eye service also likely to be a major contributor to the variations for timely assessment of urgent or routine screen-positive referrals. But whether these variations are warranted or unwarranted most often remains undetermined with little or no direct action taken to address them.

INCREASING SCREENING INTERVALS FOR LOW-RISK GROUPS

In 2016, the UK National Screening Committee recommended extending DESP screening intervals from annual to biennial for those in the eligible population deemed to be at low risk of developing diabetes-related sight loss.[24] This was based on extensive review of best available evidence at that time, consideration of the impact on clinical risk and healthcare resources, and achieving consensus among healthcare professionals and stakeholders involved in the management of diabetic retinopathy. This policy has already been implemented in Scotland, Northern Ireland and Wales, and phased implementation is imminent in England.[24]

Olvera-Barrios *et al* modelled the impact of biennial screening intervals and report a potential increased risk of delay in detection of STDR by ethnicity and younger age groups. Taken together with the increased risk of developing STDR among these groups,[9–14] they suggest that extending screening intervals may pose a greater, but as yet unquantified, risk for diabetes-related sight loss in these populations, and potentially introduce further disparities in the detection and management of diabetic eye disease. Their findings are timely and important. However, the authors recognise the need for replication of their results in other UK populations. The role of technologies for retinal imaging and artificial intelligence for image analysis to maintain the current status quo for annual screening, or introducing tailored intervals based on demographic factors to mitigate for the introduction of any additional disparities among people with diabetes, are discussed. While reasonable, these currently have their own limitations in terms of available evidence on their performance in diverse populations, availability of resources and implications for service delivery.

Given the significant change in service delivery that has either already taken place or is imminent,[24] and the evidence now available, a review and update of DESP standards and their reporting requirements (last undertaken in 2019), should be planned to take account of the differential impact among subgroups of the population eligible for diabetic eye screening. Key performance standards[17] could be reported by age and ethnicity (for which data should already be collected) and be incorporated into routine quarterly and annual reporting through existing processes so that differences in subgroups of the screened population are not masked in reports of overall performance.

Introducing a requirement to report by age and ethnicity for selected screening standards would enable regular, prospective monitoring of changes to service delivery, so disparities do not remain unrecognised, and provide information

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for responsive action on any unwarranted variations that are identified. This approach is both practical and sustainable, but is now also necessary; and in doing so would provide the 'real world large scale data' which the authors are calling for.

In addition, such granular routine reporting of service activity on key demographic factors provides a major and continuing contribution to the population-based evidence required to inform any future changes to health policy (eg, further amendment to screening intervals or introduction of newer technologies to assist screening processes), while ensuring that both clinical and demographic risk for diabetic eye disease are taken into account given our existing knowledge of health inequalities.

Because one size may not always fit all.

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