Diabetic Retinopathy in Canada: Challenges in Screening and Implications for Practice

Fady Sedarous, BHSc., MD Candidate[1]

[1]Faculty of Medicine, University of Toronto

Despite being a treatable disease, diabetic retinopathy is the leading cause of new cases of blindness in North America and is the most common microvascular complication of diabetes.[1,2] It a serious vision-threatening condition causing progressive damage to the retinal vasculature, and may affect over one million Ontarians with diabetes.[3] Although treatments are generally well tolerated, targeting prevention and monitoring is ideal when dealing with retinopathy, since treatment is much more successful when detected early. Vision-threatening retinopathy is rare in the first 3-5 years of individuals diagnosed with type I diabetes or before puberty[1] However, almost all patients with type I diabetes and >60% of patients with type II diabetes develop some form of retinopathy during the first two decades of disease1. Glycemic control is most commonly accepted as the most effective protective mechanism against the progression of retinopathy in both type I and type II diabetes.[1] As a significant number of patients with vision-threatening disease may be asymptomatic, ongoing evaluation for retinopathy is of great importance. The Canadian Diabetes Association has published clinical practice guidelines with recommendations on the frequency of screening individuals with diabetes for retinopathy. The current guidelines include initiating screening 5 years after diagnosis for all individuals 15 years of age or older diagnosed with type I diabetes and in all individuals at diagnosis of type II diabetes.[4] Furthermore, individuals with type I diabetes should undergo annual rescreening and those with type II diabetes should undergo rescreening every 1-2 years.[4] However, there exists a significant gap between the published guidelines and the rate of screening among Ontarians.

Although yearly screening for patients with diabetes is covered in most provinces including Ontario, in 2015, only two-thirds of Ontarians aged 20 and older with diabetes were screened for retinopathy within the recommended two-year period.[3] This rate has improved very little over the past three years.[3] Similar numbers have been estimated Canada-wide in 2007.[5] Reasons for this gap need to be explored and targeted. One reason for this discrepancy may be due to confusion regarding the delisting of routine eye exams for healthy adults from the Ontario Health Insurance Plan (OHIP) in 2003/2004.[6] This delisting may have had the unintended consequence of reducing publicly funded retinopathy screening for individuals with diabetes, as the rates of diabetic retinopathy screening among adults aged 20 to 64 years old have dropped most significantly between 2003/2004 to 2005/2006.[6] Many patients with diabetes may be unaware that they are still covered by OHIP for yearly eye examinations as well as any related follow-up assessments that may be required. As of 2015, all provinces and territories in Canada, with the exception of Newfoundland and Labrador, provide diabetics with coverage for yearly eye examinations.[7]

A number of studies have examined barriers to eye care among patients with diabetes, correlating factors such as age, income, education, health insurance, duration of diabetes and financial burdens with changes in compliance.[6,8,10,11] Physicians in one study cite inadequate diabetic patient education as the biggest barrier to screening, whereas patients largely believe that their diabetic education is adequate.[8] Despite knowledge that eye examinations were recommended, patients in this study were found to have limited understanding of the rationale behind screening recommendation and little knowledge regarding retinopathy itself.[8] A recent Canadian study also describes several factors associated with an increased likelihood of patients with type II diabetes obtaining retinopathy screening. These factors include discussing diabetic complications with a health professional, private insurance coverage, duration of diabetes greater than 10 years and higher income levels.[9] One important suggestion from the study is that discussion of the risks of visual problems between physicians and patients is a key approach to improving eye screening utilization.[9] In order to effectively carry out this suggestion, it would be worthwhile to evaluate what and how much diabetic patients understand about their risk of vision loss.

There is a lack of data, however, of patient understanding regarding diabetic retinopathy and its complications in Canada. Most studies on this subject have been conducted in Asian countries, where patient demographics and understanding may be different. Age, level of education, and social economic status are all factors found to affect awareness that diabetes

Corresponding Author:
Fady Sedarous
fady.sedarous@mail.utoronto.ca

may cause impaired vision in one study in India. Across these studies, 80.6% to 88.1% of diabetic patients mention awareness that diabetes could damage their eyes and vision in some way.[10,11,12,13] However, only 41.9% of patients in one study state that annual eye examinations are necessary for diabetes.[12] While none of these studies have been conducted in Canada, patients in Canada may also be unaware of the importance of regular screening suggested by recommended guidelines.

If patients do not understand the risks associated with poor disease control, then their likelihood to adhere to recommended prevention strategies and treatments may be compromised. Physicians play an important role in educating and motivating patients to achieve better metabolic control, which can reduce the progression of retinopathy more than any ocular treatment currently used in ophthalmology practice.[13] Furthermore, patients must be educated regarding the importance of annual eye examinations in detecting early signs of retinopathy, even if they are asymptomatic. It is clear that there remains much work to be done to improve eye screening compliance among diabetic patients in Canada in comparison to other countries such as Iceland, where, according to one study, the compliance rate among non-blind diabetic patients to a biannual screening program was found to be 77%.[14] Another study conducted in Iceland, the first country to initiate a systemic diabetic eye screening program, notes a significantly low prevalence of diabetic blindness following institution of the screening program, which indicates the efficacy in prevention of such a program.[15]

What then can be done to increase the rate of diabetic retinopathy screening in Canada? As a first step, one suggestion is to conduct a study similar to those done previously in other countries: conduct a baseline assessment of patient understanding of ocular complications and the need for regular eye examinations. Several studies conducted in other countries fail to provide a holistic view of patient encounters with their health care providers surrounding diagnosis.[10,11] Thus, in addition to assessing knowledge of retinopathy and recommended guidelines, it suggested that such a study also examines patients' encounters with their healthcare providers regarding diabetic retinopathy education both upon diagnosis and in follow-up encounters. Obtaining this information may help guide future management and education. Better education by healthcare providers with regards to diabetic retinopathy upon diagnosis and over the course of one's illness is an important form of health promotion. Diabetic retinopathy education may vary widely among healthcare providers. In general, it is important that patients understand general information about the condition, concerning symptoms, risk factors (especially modifiable risk factors), ways to prevent or delay progression and recommended screening guidelines, as outlined by a patient education brochure on diabetic retinopathy created by the Canadian National Institute for the Blind (CNIB).[16] Another step is advocating for formal screening programs, as no such program exists in Ontario, in contrast to other medical conditions. For example, Cancer Care Ontario sends invitation letters for those eligible for colon cancer screening, as well as reminder letters explaining the importance of screening when it is time to return for screening.[17] Such a strategy also allows for increased opportunity for patients to initiate a discussion about screening with their healthcare provider, should this discussion not have already been initiated.

In summary, diabetic retinopathy is a serious, yet highly treatable vision-threatening condition. Unfortunately, there exists a significant gap between the published guidelines and the rate of screening among Ontarians, despite provincial coverage for annual screening eye examinations. There is a lack of data on patient understanding regarding diabetic retinopathy and its complications in Canada. Obtaining such information may prove to be useful in guiding conversations and educating patients regarding diabetic retinopathy and ways to reduce risk of its progression. Other strategies include advocating for formal diabetic retinopathy screening programs. With the increasing burden of diabetes on the Canadian population, engaging in these types of health promotion and advocacy can significantly improve the quality of life and health of patients with diabetes.

References

1. Fong DS, Aiello L, Gardner TW, et al. Retinopathy in diabetes. Diabetes Care 2004;27(1):s84-s87.
2. Eye Diseases Prevalence Research Group. The prevalence of diabetic retinopathy among adults in the United States. Arch Ophthalmol 2004;122(4):552-563.
3. Measuring up: A yearly report on how Ontario's health system is performing. Health Quality Ontario 2015;48-49.
4. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2013;37(1):s1-s212.
5. CIHI. Diabetes care gaps and disparities in Canada. Ottawa, ON: Canadian Institute for Health Information 2009.
6. Kiran T, Kopp A, Moineddin R, et al. Unintended consequences of delisting routine eye exams on retinopathy screening for people with diabetes in Ontario, Canada. CMAJ 2013;185(3):e167-e173.
7. An overview of provincial health coverage for optometric care in 2014. The Canadian Association of Optometrists 2014.
8. Hartnett ME, Key IJ, Loyacano NM, Horswell RL, Desalvo KB. Perceived barriers to diabetic eye care: qualitative study of patients and physicians. Arch ophthalmol 2005;123(3): 387-391.
9. Hwang J, Rudnisky C, Bowen S, Johnson JA. Socioeconomic factors associated with visual impairment and ophthalmic care utilization in patients with type II diabetes. CJO 2015;50(2): 119-126.
10. Dandona R, Dandona L, John RK, McCarty CA, Rao GN. Awareness of eye diseases in an urban population in southern India. Bull World Health Organ 2001;79(2): 96-102.
11. Muecke JS, Newland HS, Ryan P, et al. Awareness of diabetic eye disease among general practitioners and diabetic patients in Yangon, Myanmar. Clin Exp Ophthalmol 2008;36(3): 265-273.
12. Cetin EN, Zencir M, Frenkçi S, Akin F, Yildirim C. Assessment of awareness of diabetic retinopathy and utilization of eye care services among Turkish diabetic patients. Prim Care Diabetes 2013;7(4): 297-302.
13. Beck RW. The burgeoning public health impact of diabetes: the role of the ophthalmologist. Arch Ophthalmol 2011;129(2): 225-229.
14. Zoega GM, Gunnarsdóttir P, Björnsdóttir S, Hreiðarsson ÁB, Viggósson G, Stefánsson E. Screening compliance and visual outcome in diabetes. Acta Ophthalmol Scand 2005;83(6): 687-690.
15. Ólafsdóttir E, Stefánsson E. Biennial eye screening in patients with diabetes without retinopathy: 10-year experience. Br J Ophthalmol 2007;91(12): 1599-1601.
16. CNIB: Your guide to diabetic retinopathy [Internet]. Canadian National Institute for the Blind c1996-2017 [cited 2017 Mar 30]. Available from: http://www.cnib.ca/.
17. CCO: Letters to the public about cancer screening [Internet]. Cancer Care Ontario c2017 [cited 2017 Mar 30]. Available from: http://www.cancercare.on.ca/.