ORIGINAL ARTICLE

Comparison of glaucoma knowledge and referral practices among family physicians with ophthalmologists' expectations

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ABSTRACT • RÉSUMÉ

Objective: To compare family physicians' glaucoma knowledge and clinical skills with ophthalmologists' expectations.

Design: An electronic cross-sectional survey of family physicians and ophthalmologists.

Participants: Participants included members of the Canadian Ophthalmological Society, Canadian Glaucoma Society, and the American Glaucoma Society, as well as family physicians in the Canadian Medical Directory and the Society of Rural Physicians of Canada listserv.

Methods: Two complementary surveys were developed to evaluate family physicians' glaucoma knowledge and basic examination skills, and ophthalmologists' expected level of family physician clinical knowledge and skills. χ^2 tests identified differences between family physician and ophthalmologist responses. Differences in family physician knowledge based on practice location and frequency of patient visits with a diagnosis of glaucoma were also evaluated.

Results: A total of 142 ophthalmologists and 110 family physicians completed the survey. The majority (82%) of family physicians reported seeing patients with diagnosed glaucoma weekly, monthly, or semiannually. Significantly fewer family physicians than expected ($p < 0.001$) identified African descent (46%) and corticosteroid use (84%) as glaucoma risk factors. Family physicians were significantly less likely to refer based on risk factors (72%) than expected by ophthalmologists (91%; $p < 0.001$). Only 28% of family physicians were comfortable performing direct ophthalmoscopy, and 37% were comfortable checking for a relative afferent pupillary defect. A significant percentage of family physicians lacked knowledge of glaucoma medications (30%) and side effects (57%).

Conclusions: This study revealed significant disparities in family physician glaucoma knowledge, clinical examination skills, and referral practices. Educational materials should target these knowledge gaps.

Objet : Comparer les connaissances et les aptitudes cliniques de médecins de famille concernant le glaucome avec les attentes d'ophtalmologistes.

Nature : Enquête transversale électronique auprès de médecins de famille et d'ophtalmologistes.

Participants : Membres de la Société canadienne d'ophtalmologie, de la Société canadienne de glaucome et de l'American Glaucoma Society. Médecins de famille inscrits au Canadian Medical Directory et sur la liste de distribution de la Société de la médecine rurale du Canada.

Méthodes : On a élaboré deux enquêtes complémentaires pour évaluer, d'une part, les connaissances des médecins de famille sur le glaucome et leurs aptitudes cliniques de base et, d'autre part, le niveau de connaissances et d'aptitudes cliniques que des ophtalmologistes attendent des médecins de famille. Des tests du chi carré ont relevé les différences entre les réponses des médecins de famille et celles des ophtalmologistes. On a aussi évalué les écarts de connaissances des médecins de famille en fonction du lieu de pratique et de la fréquence de visite de patients ayant un diagnostic de glaucome.

Résultats : 142 ophtalmologistes et 110 médecins de famille ont répondu à l'enquête. La majorité (82 %) des médecins de famille ont indiqué voir hebdomadairement, mensuellement ou semestriellement des patients ayant un glaucome diagnostiqué. Une proportion beaucoup plus faible que prévu des médecins de famille ($p < 0{,}001$) ont identifié la descendance africaine (46 %) et l'utilisation de corticostéroïdes (84 %) comme des facteurs de risque liés au glaucome. Les médecins de famille étaient significativement moins susceptibles de diriger un patient vers un spécialiste sur la base de facteurs de risque (72 %) que ne s'y attendaient les ophtalmologistes (91 %) ($p < 0{,}001$). Seulement 28 % des médecins de famille étaient à l'aise de réaliser une ophtalmoscopie directe, et 37 % étaient à l'aise de vérifier la présence d'un déficit pupillaire afférent relatif. Un pourcentage significatif des médecins de famille manquaient de connaissances sur les médicaments pour le glaucome (30 %) et leurs effets secondaires (57 %).

Conclusions : Cette étude a révélé des disparités significatives dans les connaissances des médecins de famille sur le glaucome, leur aptitude à réaliser des examens cliniques et leurs pratiques de recommandation de patients à des spécialistes. Le matériel de sensibilisation devrait cibler ces lacunes.

Glaucoma is the leading cause of irreversible vision loss worldwide.[1,2] In Canada, the estimated prevalence rate of glaucoma is 2.7% for those ≥ 40 years.[3] Because vision loss from glaucoma is irreversible, early diagnosis and treatment is important.[4–7] Early diagnosis of glaucoma is, however, complicated by the lack of symptoms until

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advanced disease. This likely has contributed to the finding that 50% of people with glaucoma are undiagnosed and, therefore, not receiving treatment.[8,9] This was recently confirmed in a Toronto epidemiology study where a 3.9% prevalence rate of undiagnosed glaucoma and 7.5% prevalence rate of self-reported glaucoma was found in a random population.[10] In addition to a high percentage of undiagnosed glaucoma, a recent study of newly diagnosed patients with glaucoma in Canada found that 50% had moderate-to-advanced disease at the time of initial diagnosis.[11] Although the majority of the referrals were initiated by optometrists, family physicians initiated 7% of these referrals.[11] Because only 27% to 64% of Canadians attend regular optometric examinations,[12] family physicians could potentially help identify patients at risk for glaucoma and who do not receive annual eye examinations.

This study aims to determine the family physician's glaucoma knowledge and perceived ophthalmic clinical examination skill set and compare it with the ophthalmologist's expectation of a family physician. The goal of this study is to inform the development of a national glaucoma guideline for family physicians. This guideline will target knowledge gaps uncovered by this research.

Methods

Two complementary surveys were developed, 1 for family physicians (see Appendix A, available online) and 1 for ophthalmologists (see Appendix B, available online). The family physician survey included questions about demographics, individual practice setting, frequency of patients with a diagnosis of glaucoma in their practice, and questions regarding glaucoma knowledge, examination skills, and glaucoma referral practices. Glaucoma knowledge questions were based on the Canadian Ophthalmological Society evidence-based clinical practice guidelines for the management of glaucoma in the adult eye.[13]

The complementary ophthalmologist survey identified what is expected of family physician glaucoma knowledge. For example, 1 item on the family physician survey asked: "To what extent do you agree that you would refer based on the presence of glaucoma risk factors?" For this item, the ophthalmologist survey asked: "To what extent do you agree that family physicians should refer based on the presence of glaucoma risk factors?" Responses were recorded on a 5-point Likert scale, which ranged from strongly agree to strongly disagree.

The survey was developed in consultation with family physicians and ophthalmologists. A pilot survey was initially distributed to a small number of family physicians and ophthalmologists, and the feedback was integrated into the final survey.

The family physician survey was electronically distributed to members of the Canadian Medical Directory who provided email addresses in their profile and to the Society of Rural Physicians of Canada listserv. The ophthalmologist survey was distributed via listserv to members of the Canadian Ophthalmological Society, Canadian Glaucoma Society, and the American Glaucoma Society. Because this was a needs assessment, our goal was to collect 100 surveys from each group. Research ethics approval was received from the Research Ethics Board at the University Health Network, Toronto, Ontario.

Statistical analysis

Means and proportions were used to summarize pertinent demographics, frequency of glaucoma in the family clinic, and physician use of resources. To compare responses between family physicians and ophthalmologists, we divided Likert data into 2 categories: "agree" (*strongly agree* and *agree*) and "disagree" (*neutral, disagree,* and *strongly disagree*). The percentage of "agree" responses by family physicians and ophthalmologists was calculated and compared using the χ^2 test. We also used χ^2 tests to explore response differences based on location of practice (rural vs urban), year of graduation, and frequency of seeing patients with a diagnosis of glaucoma. The p values less than 0.05 were considered significant.

Results

The survey was made available for 1 month. A total of 110 family physicians and 142 ophthalmologists completed the survey. The age of the family physician respondents (Table 1) (mean ± SD, 50.9 ± 9.6 years) was not significantly different from that reported in the National Physician Survey (mean ± SD, 49.7 ± 11.0; $p = 0.27$).[14]

A large percentage of family physicians reported that they saw patients with a diagnosis of glaucoma weekly

Table 1—Demographic information collected from family physician respondents

Average age	50.9 ± 9.6 y
Average year of medical school graduation	1988 ± 10.60
Location of medical school attended, n (%)	
Canada	72 (81%)
Non-Canadian	17 (19%)
Practice setting, n (%)	
Community hospital	11 (10%)
Academic hospital	11 (10%)
Private clinic	64 (60%)
Walk-in clinic	3 (3%)
Nursing home	1 (1%)
Other	16 (15%)
Work setting, n (%)	
Solo practice	18 (17%)
Group practice	53 (50%)
Interprofessional	27 (25%)
Other	8 (8%)
Location of practice, n (%)	
Urban	76 (71%)
Rural	31 (29%)