Level of agreement among Latin American glaucoma subspecialists on the diagnosis and treatment of glaucoma: results of an online survey

Nível de concordância entre subespecialistas de glaucoma latino-americanos sobre o diagnóstico e tratamento do glaucoma: resultados de uma pesquisa digital

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ABSTRACT

Purpose: The aim of this research was to assess the level of agreement among glaucoma experts in Latin America on key practices related to treatment and diagnosis of glaucoma.

Methods: An online questionnaire was sent to a multinational panel of glaucoma experts. The questionnaire contained 107 statements on the medical treatment (Part 1) and diagnosis (Part 2) of glaucoma, and was developed in Spanish and translated into English. Agreement was defined as ≥70% of respondents.

Results: Fifty participants from 14 countries completed the questionnaire. For the medical treatment of glaucoma, nearly all respondents (98% or greater) confirmed that medical treatment as first-line therapy is preferred to surgery, prostaglandin analogs are the medication of first choice for primary open-angle glaucoma (POAG), longitudinal monitoring of efficacy should include intraocular pressure, structural and functional status, as well as if patients' quality of life is impaired by the high cost of medication. For the diagnosis of glaucoma section, all respondents confirmed that, after initial examination, gonioscopy should be repeated over time, standard automated perimetry is the most important functional examination for diagnosis and monitoring of primary open-angle glaucoma, central corneal thickness is important in assessment of glaucoma, and computerized imaging tests help in clinical evaluation of optic disc.

Conclusions: This survey shows a high level of agreement on most aspects of glaucoma diagnosis and treatment among Latin American glaucoma experts. Areas of disagreement highlight the need for further evidence or education. These findings will be useful for guiding future efforts to optimize glaucoma practice by clinicians in Latin America.

Keywords: Glaucoma/diagnosis; Glaucoma/therapy; Questionnaires; Humans

RESUMO

Objetivo: *Avaliar o nível de concordância entre os especialistas de glaucoma na América Latina sobre as práticas mais importantes relacionadas ao tratamento e diagnóstico de glaucoma.*

Métodos: *Um questionário digital foi enviado a um painel multinacional de especialistas em glaucoma. O questionário continha 107 declarações sobre o tratamento médico (Parte 1) e diagnóstico (Parte 2) de glaucoma, e foi desenvolvido em espanhol e traduzido para o Inglês. Concordância foi definida como ≥ 70% dos entrevistados.*

Resultados: *Cinquenta participantes de 14 países responderam ao questionário. Para o tratamento médico de glaucoma, quase todas as respostas (98% ou mais), confirmaram que o tratamento médico como terapia de primeira linha é preferido para a cirurgia, os análogos das prostaglandinas são os medicamentos de primeira escolha para o glaucoma primário de ângulo aberto (GPAA), a monitoração longitudinal eficácia deve incluir a pressão intraocular o estado estrutural e funcional além da qualidade de vida do paciente ser prejudicada pelo alto custo da medicação. Para a seção sobre o diagnóstico de glaucoma, todos os entrevistados confirmaram que, após análise inicial, a gonioscopia deve ser repetida ao longo do tempo, a perimetria automatizada padrão é o exame funcional mais importante para o diagnóstico e monitoramento do glaucoma primário de ângulo aberto, a espessura corneana central é importante na avaliação do glaucoma e exames de imagem computadorizados ajudam na avaliação clínica do disco óptico.*

Conclusões: *Este estudo mostra um alto nível de concordância na maioria dos aspectos do diagnóstico e tratamento de glaucoma entre os especialistas em glaucoma latino-americanos. Áreas de desacordo destacam a necessidade de novas evidências ou educação. Estes resultados serão úteis para orientar futuros esforços na otimização de práticas em relação ao glaucoma por médicos da América Latina.*

Descritores: *Glaucoma/diagnóstico; Glaucoma/tratamento; Questionários; Humanos*

INTRODUCTION

It has been estimated that almost 5.7 million people in Latin America have glaucoma, principally the open-angle subtype, and that this number will increase to approximately 8 million people by 2020[1]. The burden of glaucoma is substantial in Latin America, where it is one of the leading causes of blindness or visual impairment in both adults and children[2-9] and has a significant negative impact on quality of life[10]. The burden of glaucoma may be higher in Latin

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America than in more developed regions because poverty acts as a barrier to effective diagnosis and treatment[11,12], resulting in a high proportion of patients presenting with advanced disease.

While diagnostic and treatment strategies for glaucoma have evolved over the years, many gaps remain in our understanding of optimal practice for diagnosis and management. Moreover, management practices differ between and even within countries, depending on the health infrastructure. Recently, attempts have been made by the World Glaucoma Association (WGA) to provide guidance on international best practices in glaucoma diagnosis and treatment. To this end, the WGA has developed a number of consensus statements, providing guidance on a range of issues including structure and function in the diagnosis of glaucoma[13], closed-angle glaucoma (CAG), intraocular pressure (IOP), and medical therapy[14].

Typically, consensus statements on glaucoma management practices have been developed by a restricted panel working in two phases: first surveying participants for their agreement on particular questions relating to clinical practice, and then meeting to share the results of the survey, before asking panelists to rate the questions again[15,16]. However, considerable insight into the level of agreement among clinical experts can also be gained by administration of a single survey[17-19], which can then guide the development of guidelines or highlight the need for further research or education on a national or regional basis.

The Latin American Glaucoma Society (LAGS) developed a survey among key clinical experts in the region to determine the level of agreement on key practices related to the treatment and diagnosis of glaucoma, including region-specific issues in Latin America. Here we report the methodology and findings of this research initiative.

METHODS

Questionnaire preparation

A multinational panel of ophthalmology experts developed a two-part questionnaire: Part 1 was on the medical treatment of glaucoma and Part 2 was on the diagnosis of glaucoma. The questionnaire consisted of a number of statements; respondents were asked to rate their agreement with each statement using various scales. The statements were developed by the panel based on an analysis of the medical literature, a review of existing WGA consensus statements, and their own clinical experience. Relevant medical literature was identified by means of a PubMed search undertaken in September 2009. The following search terms were used: treatment strategies, target IOP, general concepts about medical therapy, antiglaucoma drugs, adverse events, neuroprotection, compliance, specific aspects of treatment in Latin America and generic/copy medications, general aspects of glaucoma diagnosis, clinical examination of the optic nerve, examination of the nerve fiber layer, diagnosis in primary closed-angle glaucoma (PCAG), gonioscopy, functional examination, IOP, and structural examination by imaging. At the time of survey development, WGA consensus statements were available for diagnosis[13] and IOP, but not for glaucoma treatment.

The survey development panel drafted 107 statements relating to the medical therapy or diagnosis of glaucoma. The full results of the survey are presented in this paper (see Appendix). The questionnaire included open-ended and closed-ended questions (yes/no, multiple choice, rating scale).

Survey

The survey was developed in Spanish, translated into English, and uploaded to an online survey tool. An email invitation to complete the survey was sent to 50 individuals from geographically diverse parts of the region: 31 were members of the LAGS and 19 were others who were identified by LAGS members as Latin American ophthalmologists with particular expertise in the field of glaucoma diagnosis and treatment. The survey was completed between October 2009 and April 2010.

Analysis

Upon receipt of the questionnaire results, the level of agreement or disagreement for each statement was calculated by assessing the percentage of respondents giving each answer. Consensus was defined a priori as agreement in >70% of the group. For Likert scale questions, "strongly agree" and "agree", "strongly disagree" and "disagree" were pooled together. Combining scores for the purposes of categorization has been used in previous similar studies, in both glaucoma[15,16] and other indications[20]. Internal consistency for each part (medical treatment and diagnosis of glaucoma) and for each subcategory/topic, as well as overall consistency, was measured using a standardized Cronbach's coefficient alpha. A Cronbach's coefficient alpha of ≥0.65 was considered to indicate internal consistency.

RESULTS

All 50 participants returned the survey and 48 participants completed all questions in the survey. Survey respondents were from Brazil (n=16), Argentina (n=9), Colombia (n=5), Mexico (n=4), Chile (n=3), Peru (n=3), Venezuela (n=3), Costa Rica (n=1), Guatemala (n=1), Ecuador (n=1), Paraguay (n=1), Puerto Rico (n=1), Uruguay (n=1), and USA (n=1). Most participants (n=30) worked in both private practice and the public sector, but 17 worked solely in private practice and 1 solely in the public sector; 2 participants did not answer the question on clinical practice type. Survey respondents had been in clinical practice for between 2 and 50 years (mean ± standard deviation [SD] 22.68 ± 10.75 years).

Overall, the panel found agreement in 75 (70.1%) of 107 statements and no agreement in 32 (29.9%) (Tables 1 and 2). We will now highlight the results of the survey; for full results, please refer to the Appendix. In Part 1, medical treatment of glaucoma, respondents unanimously agreed that knowing the hypotensive efficacy of different glaucoma medications was essential (question 15). Examples of medical therapy questions on which no agreement was reached were those related to achieving the greatest possible reduction in IOP (question 10), what constitutes the maximal number of medications (question 19), whether prostaglandin analogs reduce IOP in open-angle glaucoma (OAG) with peripheral anterior synechiae (question 25), the maximum number of daily doses to maintain patient adherence (question 37), and whether generic medications are bioequivalent and interchangeable (question 46).

In Part 2 on glaucoma diagnosis, respondents unanimously agreed on four issues: that after initial examination, gonioscopy should be performed in all patients with glaucoma or suspected glaucoma and repeated over time (questions 83 and 84), that standard automated perimetry (SAP) is the most important functional examination for the diagnosis and monitoring of primary open-angle glaucoma (POAG) (question 88), that central corneal thickness is important in the assessment of glaucoma or suspected glaucoma (question 92), and that computerized imaging helps in clinical evaluation of the optic disc (question 103). Examples of diagnostic questions where no agreement was reached were those relating to initial assessment of the optic nerve fiber layer (question 77), the most useful tonometric method to use in suspect glaucoma patients (question 98), use of the Pascal tonometer (question 95) or ocular response analyzer (ORA) (question 96) in preference to the Goldmann tonometer, tests for early detection of glaucoma damage (question 105), and optimal method of analyzing progression of nerve fiber layer (question 107).

Consistency scores for the full 107-question survey were 0.675619 for Part 1 on medical treatment of glaucoma, 0.640498 for Part 2 on diagnosis of glaucoma, and 0.675030 overall, indicating a general consistency in responses.

Table 1. Medical treatment of glaucoma consensus statements (questions with 70% or greater agreement)

Question Nº	Nº of responses	Summary	n (%)
		Treatment strategies	
8	50	Medical treatment is preferred first-line (over surgery)	49 (98.0%)
		Target intraocular pressure	
9	50	Target IOP is a useful concept	48 (96.0%)
14	50	Target IOP concept is dynamic and must be individualized	48 (96.0%)
11	50	Target IOP must be determined for each patient	48 (96.0%)
12	50	IOP should be at stable target levels for over 24 hours	45 (90.0%)
13	50	Ideal medication decreases IOP, has minimal ocular side effects, and is affordable	47 (94.0%)
		General concepts	
15	50	Knowledge of hypotensive efficacy of medication is essential	50 (100.0%)
18	50	If hypotensive effect is <10%, medication is replaced with another	44 (88.0%)
21	50	Medication of first choice for POAG is prostaglandin analogs	49 (98.0%)
16	50	Longitudinal monitoring of efficacy should include IOP, structural and functional status	49 (98.0%)
17	50	Hypotensive efficacy, with reasonable safety, is more important for choosing medication	39 (78.0%)
20	50	Chronic use of benzalkonium chloride adversely affects prognosis for surgery	47 (94.0%)
24	50	There are no significant clinical differences in hypotensive efficacy between different prostaglandin analogs	38 (76.0%)
26	50	There are no significant clinical differences in hypotensive efficacy between different carbonic anhydrase inhibitors	43 (86.0%)
22	50	Prostaglandin analogs have a significantly higher hypotensive efficacy than β-blockers	50 (100.0%)
		Adverse events	
31	50	β-blockers have the best LOCAL safety profile	42 (84.0%)
32	50	Prostaglandin analogs have the best SYSTEMIC safety profile	45 (90.0%)
27	50	Hyperemia associated with the use of some glaucoma treatment medications is related to a mild inflammatory response	36 (72.0%)
		Neuroprotection	
33	50	No systemic medication has a proven neuroprotective action in humans	43 (86.0%)
34	50	No topical medication has a proven neuroprotective action in humans in addition to IOP lowering	46 (92.0%)
		Compliance	
39	50	Quality of life is impaired by the high cost of medication	48 (96.0%)
35	50	Lack of patient compliance is the main cause of glaucoma treatment failure	37 (74.0%)
36	50	Compliance with medical therapy is a major impediment affecting approximately 50% of patients	40 (80.0%)
41	50	Education for patients about their illness is critical for improving treatment compliance	48 (96.0%)
		Specific aspects of treatment in Latin America	
44	50	I agree with the use of prostaglandin/timolol combinations in Latin America	42 (84.0%)
42	50	Glaucoma therapy is unaffordable for most patients in Latin America	36 (72.0%)
45	50	It is not important for prostaglandin/timolol combinations to be approved by the FDA	35 (70.0%)
		Generic/copy drugs	
47	49	Copy medications are not bioequivalent and interchangeable	40 (81.6%)
50	49	We as a group should be doing something about access to quality medical therapy	47 (95.9%)
51	49	I would participate in a multicenter comparative study of original medications versus generic/"copy" medications designed by the LAGS	46 (93.9%)

FDA= Food and Drug Administration; IOP= intraocular pressure; LAGS= Latin American Glaucoma Society; POAG= primary open-angle glaucoma.

DISCUSSION

To our knowledge, this is the first region-wide survey of glaucoma diagnostic and treatment preferences among Latin American ophthalmologists. Our study has found a substantial level of agreement among glaucoma specialists in Latin America for most diagnostic and treatment practices surveyed.

Our survey found consistent agreement among regional specialists surveyed about the importance of treating to target IOP and maintaining a stable IOP over 24 hours, whereas the respondents did not agree that the greatest possible decrease in IOP should be sought in order to minimize the risk of progression of glaucoma damage. This implies that, among two possible strategies for optimizing medical

Table 2. Diagnosis of glaucoma consensus statements (questions with 70% or greater agreement)

Question Nº	Nº of responses	Summary	n (%) responding in the affirmative
		General concepts	
55	48	Elevated IOP is not essential for diagnosis of POAG	41 (85.4%)
57	48	Blood flow to the optic nerve is important in POAG pathogenesis	35 (72.9%)
52	48	Structural and/or functional signs of damage are essential for diagnosis	44 (91.7%)
54	48	Glaucoma diagnosis requires characteristic change to optic disc or visual field defect	40 (83.3%)
56	48	Lack of defect in achromatic pathway is a requisite for pre-perimetric diagnosis	38 (79.2%)
		Clinical examination of the optic nerve	
67	48	Advisable to estimate optic disc size biomicroscopically by slit lamp and/or direct ophthalmoscopy	37 (77.1%)
68	48	Loss of shape of neuroretinal ring in normal-sized optic nerve heads is an early sign of glaucoma	42 (87.5%)
73	48	Clinical examination of the optic nerve should include disc size, keeping the ISNT rule, cup-disc ratio, asymmetry in the C-D ratio, rim regularity, rim color and cupping, position of the blood vessels, presence of papillary and juxtapapillary hemorrhages, peripapillary atrophy and conservation of the nerve fiber layer	43 (89.6%)
59	48	Clinical examination of optic nerve with dilated pupil in slit lamp using indirect magnification is the structural gold standard for examining POAG	44 (91.7%)
60	48	Recording the condition of the optic nerve is essential in glaucoma and suspected glaucoma	46 (95.8%)
61	48	Recording of optic nerve condition should be by color spectrophotography, digital photography and/or structural imaging, with itemized drawing if other technologies are unavailable	44 (91.7%)
62	48	Photographic documentation is the gold standard for structural evaluation in glaucoma	43 (89.6%)
63	48	Serial photography is the basic minimum structural method of recording progression in POAG	45 (93.8%)
64	48	Examination with indirect vision lenses (90, 78, and 60 diopters) is suitable for clinical evaluation of optic nerve	45 (93.8%)
72	48	Increase with time in area of cupping or cup-disc ratio is important in differentiating normal nerve and glaucoma	47 (97.9%)
74	48	It is advisable to examine the optic nerve's condition in glaucoma patients at each visit	36 (75.0%)
58	48	An optic nerve examination is essential for the diagnosis and management of glaucoma	45 (93.7%)
65	48	Lenses with higher dioptric power (90D) provide satisfactory viewing in almost all pupil sizes, while the smaller ones, especially that of 60D, require mydriasis, or at least that the pupil diameter not be reduced. The latter, however, provide a better view of the details of the optic nerve	37 (77.1%)
69	48	Optic disc hemorrhages indicate the presence of glaucoma damage and suggest progression, and are most frequently found in normal tension glaucoma	44 (91.6%)
70	48	Early or moderate optic nerve damage can be underestimated in small optical nerves, and a proper diagnosis may not be made	48 (100.0%)
71	48	In large optic nerves, the diagnosis of glaucoma is often overestimated	46 (95.9%)
		Examination of the nerve fiber layer	
75	48	Monitoring the condition of the nerve fiber layer in glaucoma is essential	35 (72.9%)
76	48	Diffuse defects of the nerve fiber layer in OAG are harder to detect than localized defects and are inferred by detailed observation of the vessels	47 (97.9%)
78	46	Localized defects of the nerve fiber layer are arch-shaped and extend to the edge of the optic disc	41 (85.4%)
		Diagnosis in PCAG/gonioscopy	
84	48	After the initial examination, gonioscopy should be repeated over time	48 (100.0%)
82	48	Gonioscopic evaluation is recommended as part of routine eye exam for all patients aged >40 years	34 (70.8%)
85	48	It is useful to adopt a particular gonioscopic-type classification of angle	37 (77.1%)
80	48	Van Herick's technique for estimating anterior chamber depth is not a substitute for gonioscopy	45 (93.8%)
83	48	Gonioscopy should be performed in all patients with glaucoma or suspected glaucoma	48 (100.0%)
		Functional examination	
88	48	SAP is the most important functional examination for diagnosis and monitoring of POAG	48 (100.0%)
90	48	Both frequency doubling perimetry and blue on yellow perimetry are useful in detecting functional defects before achromatic perimetry is used	39 (81.3%)
102	48	The FDT should be utilized in a glaucoma suspect with normal SAP	37 (77.1%)
87	48	The computerized perimetry examination is essential for the diagnosis of POAG	35 (72.9%)
89	48	A multimodal functional assessment (not perimetry techniques) seems to be most effective in detecting early glaucoma defects	39 (81.3%)
91	48	The functional changes in glaucoma are progressive visual field deterioration and loss of sensitivity to colors	45 (93.8%)

Table 2. Diagnosis of glaucoma consensus statements (questions with 70% or greater agreement) (continued)

Question Nº	Nº of responses	Summary	n (%) responding in the affirmative
		Intraocular pressure	
93	48	There are no suitable methods that are proven to be able to correct IOP correctly for corneal thickness	34 (70.8%)
97	48	Longitudinal studies are needed to assess importance of IOP fluctuation over 24 hours	43 (89.6%)
99	48	I request/perform IOP diurnal tension curve	40 (83.3%)
100	43	IOP diurnal tension curves should only be performed in cases of suspected glaucoma	36 (83.7%)
92	48	Central corneal thickness is important in assessment of glaucoma or suspected glaucoma	48 (100.0%)
94	48	Goldmann tonometer is the gold standard for measuring IOP	47 (97.9%)
101	48	The ibopamine test is not essential for the diagnosis of glaucoma	47 (97.9%)
		Structural examination by imaging	
103	48	Computerized imaging tests help in clinical evaluation of optic disc	48 (100.0%)
106	48	HRT is the structural method with greatest evidence of fitness for analyzing progression of optic nerve head	38 (79.2%)
104	48	Computerized imaging tests in glaucoma help in diagnosis and in longitudinal monitoring	42 (87.5%)

FDT= frequency doubling technology; IOP= intraocular pressure; ISNT= inferior ≥ superior ≥ nasal ≥ temporal; HRT= Heidelberg retinal tomography; OAG= open-angle glaucoma; PCAG= primary closed-angle glaucoma; POAG= primary open-angle glaucoma; SAP= standard automated perimetry.

therapy (using target IOP or searching for the lowest possible IOP with initial medication), the responders clearly preferred the first one. Using target IOP to guide clinical management is a well-established practice and one that is supported by the results of large-scale studies such as the Collaborative Initial Glaucoma Treatment Study (CIGTS)[21]. This approach allows treatment to be targeted to the individual's baseline IOP, optic nerve appearance and visual function, and to initiate more aggressive treatment at signs of deterioration. It also allows physicians and patients to develop a partnership in glaucoma management; if patients are aware of the target IOP they are trying to reach, they may be more engaged and adherent with treatment. While there is clear evidence that the lower the IOP, the less the risk of glaucomatous progression, physicians may be reluctant to initiate aggressive therapy because this may limit their future treatment options. Physicians may also fear that patients will develop adverse effects, potentially impacting their adherence. For some patients, the aggressive therapeutic options (combination therapy or surgery) may be unaffordable, particularly in developing countries. These factors probably contributed to the lack of agreement about achieving the greatest possible reduction in IOP in our survey.

Some statements in our survey have important educational implications. For example, the panelists consider it essential for a clinician to know the rates of hypotensive efficacy of glaucoma medications. They also agreed that a hypotensive effect of less than 10% is unacceptable and should prompt substitution with a more effective treatment.

It is also interesting to note that, in a region known historically to favor low-cost medications such as β-blockers, the Latin American glaucoma specialists in our sample considered prostaglandin analogs to be the monotherapy of first choice. This probably reflects the respondents' assessment of drug efficacy and safety rather than affordability, since there was agreement that the cost of medical therapy is not affordable for most patients in Latin America (question 42). Prostaglandin analogs have demonstrated greater hypotensive efficacy compared with other classes of topical glaucoma therapies[22,23] and a low rate of systemic adverse effects, a fact with which the Latin American respondents to our survey also showed substantive agreement. The most common adverse event with prostaglandin analogs is conjunctival hyperemia, whereas this is less frequent with topical β-blockers[24]. Latin American physicians agree that topical β-blockers have the best ocular safety profile (question 31). Overall, respondents believe that hypotensive efficacy with reasonable safety is more important than safety alone (question 17). Therefore, taken together, the survey findings indicate that Latin American physicians consider that the greater efficacy of prostaglandin analogs and their improved systemic safety profile outweigh concerns about ocular tolerability. Agreement was not reached regarding the number of bottles that constitute maximum medical therapy, or on the maximum number of instillations compatible with good cooperation with the treatment. Presumably, this reflects the diversity of adherence behavior between patients seen in routine clinical practice.

In our survey, most respondents (70.0%) did not think it was important that certain medications (like a fixed combination of prostaglandin analog plus β-blocker) have not been approved by the US Food and Drug Administration (FDA). This may indicate an acceptance of lower standards of rigor in the regulation of pharmaceutical products in Latin America compared with the US. While many survey respondents agreed (59.2%) that generic medications were bioequivalent and interchangeable, they also agreed (81.6%) that "copy medications" were not. The World Bank has suggested that Latin American regulatory agencies are under-resourced, and has highlighted differences between countries in both registration policies and terminology (including the use of the terms "generic" and "bioequivalence")[25,26]. This may have led to different interpretations of the questions relating to generic medications in our survey between respondents from different countries, and contributed to the lack of agreement about the bioequivalence of generic and "copy" medications (questions 46 and 47).

Regarding the diagnosis of glaucoma, Latin American physicians agreed on the need to examine the condition of the optic nerve at each visit, consistent with WGA recommendations[13]. However, this may be an area in which theory falls short of practice, since there are data to suggest that, even in developed countries, optic nerve status examination and documentation are suboptimal during routine clinical practice[27,28]. Our survey also found agreement on photographic documentation as the gold standard for structural evaluation in glaucoma and the value of computerized imaging in the evaluation of the optic disc. These approaches are also consistent with WGA consensus recommendations[13], and can produce more accurate and quantitative assessment of structural changes than can be achieved with annotated drawings or written chart entries[29]. Nevertheless, Latin American survey participants agreed that an itemized drawing can be a useful resource when technology is unavailable.

Latin American physicians agreed on the importance of gonioscopy in first examination for all patients over 40 years to detect the presence of CAG, and its repetition over time when examining a CAG patient or a CAG suspect. Direct epidemiologic data on prevalence of CAG in Latin America are limited. They range from a general estimation of 5.7% of glaucoma cases[1] to 21.4% in one sample from South Brazil[30]. Unpublished surveys indicate that CAG rates may be high in some native ethnic populations within Latin America.

Not surprisingly, no agreement was obtained on the new methods of tonometry such as the Pascal dynamic contour tonometer or the ORA. This may reflect a concern among Latin American physicians that more published evidence and clinical experience with these devices are required. However, there was agreement about the importance of measuring central corneal thickness in order to gain a more accurate assessment of IOP.

A limitation of the present research is that the 107 items in the survey could not cover all the issues involving diagnosis and treatment of glaucoma. Although we created the questionnaire based on a detailed review of the literature, there may have been other relevant topics that were not included. Further investigation, possibly including the distribution of a second questionnaire to experts in this field, may be needed for further validation. Such a survey could also identify any changes over time in the opinions of Latin American ophthalmologists toward optimal practice in the diagnosis and management of glaucoma.

CONCLUSION

This survey, the largest one to date on diagnosis and therapy of glaucoma among Latin American experts, has demonstrated a high level of agreement on optimal practices in the diagnosis and medical management of glaucoma. There was consensus for more than two-thirds of the questions, indicating a high level of agreement across the region on evidence-based recommendations. However, many barriers toward optimal detection and treatment of glaucoma exist in Latin America. The information gained from this survey can be used to inform future educational efforts in the region, with the aim of further improving glaucoma diagnosis and management.

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