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ORIGINAL ARTICLE

The status of glaucoma diagnostics and care in Europe in 2015: a European survey

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ABSTRACT

Purpose: To evaluate the current status of glaucoma diagnostics and care in Europe.
Methods: A questionnaire addressing glaucoma patient organizations, resident education, access to an ophthalmologist, use and reimbursement of techniques/instruments for glaucoma diagnostics and follow-up, prescription rules, and glaucoma drug reimbursement was sent to all national representatives of the European Glaucoma Society (EGS) in 2015. The country-specific responses were analyzed and summarized.
Results: Completed questionnaires were returned for 24 countries. In 2015, a glaucoma patient organization is functioning in 57% of the respondent countries. Waiting time for an ophthalmology resident position varies between ≤6 months and >2 years. The duration of ophthalmology resident training varies between 3 and 7 years. Nonemergency access to an ophthalmologist is available directly in 45.8% and via the general practitioner in 25% of the countries. Disc photography/imaging is always done during glaucoma diagnostics in 9.5% and for follow-up in 55.5% of the respondent countries. Initial therapy of glaucoma is medical in 100% (monotherapy in 91.3%) of the respondent countries. Clinical and visual field examination but not disc photography/imaging is reimbursed in 47.5% of the countries, while in another 47.5% all examinations are reimbursed. Dispensing of the prescribed original eyedrops by the pharmacists is mandatory in 43.5% of the countries, while the aut idem rule applies in 52.2%, and the aut simile rule in 4.3%.
Conclusions: Diagnostics, treatment, and follow-up of glaucoma remains diverse in Europe. The differences are due to financial/reimbursement differences. When reimbursement allows, the EGS Guidelines are followed.

Keywords: Diagnostics, European Glaucoma Society, Glaucoma care, Imaging, Medication, Reimbursement

Introduction

The first edition of the European Glaucoma Society (EGS) Guidelines was published in 1998 (1). Prior to this edition of the Guidelines, classification, diagnosis, and treatment were diverse in Europe. Since 1998, another 3 updated editions of the Guidelines have been published, and the Guidelines have become widely known and followed (2-4). To further improve glaucoma diagnostics and care in Europe, in 2014 the EGS established a committee (the Delivery of Glaucoma Care Committee), which decided to first explore the current status of glaucoma care across all European countries, and to analyze the potential obstacles to optimal and uniformly high level of glaucoma care in Europe. The current study presents the survey made by the EGS Delivery of Glaucoma Care Committee in 2015, and reports on the results.

Methods

A standard questionnaire was constructed and sent to all national representatives of the European Glaucoma Society in 2015. The national representatives (most of whom are also the presidents of national glaucoma societies) were requested to carry out the appropriate investigation regarding the national regulations and the most common or typical clinical practices relevant to the items in the questionnaire for their own countries, and then to provide data or select from the preset responses, as appropriate. The national representatives were also asked to add comments where appropriate.

The questionnaire comprised questions on the following:

- Existence of a national glaucoma patient organization (yes; no)
- Resident education in ophthalmology (length of wait for a position; length of training, in years)

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- Means of nonemergency access to an ophthalmologist (direct; via the general practitioner; via an optometrist; other option)
- Use of diagnostic techniques/instruments (slit-lamp, applanation tonometers and their types, gonioscopy, pachymetry, automated threshold perimetry, Goldmann kinetic perimetry, disc photography, scanning laser tomography [Heidelberg retina tomography], scanning laser polarimetry [GDx], time domain and Fourier-domain [FD] or spectral-domain [SD] optical coherence tomography [OCT]) for glaucoma diagnostics, for each category, respectively (always; frequently; seldom/never)
- Use of diagnostic techniques/instruments (slit-lamp, applanation tonometers and their types, gonioscopy, pachymetry, automated threshold perimetry, Goldmann kinetic perimetry, disc photography, scanning laser tomography [Heidelberg retina tomography], scanning laser polarimetry [GDx], time domain and FD or SD-OCT) for glaucoma follow-up, for each category, respectively (always; frequently; seldom/never)
- Frequency of visual field and structural testing, respectively, in glaucoma cases without rapid progression (maximum 1/year; 1-2/year; more frequently)
- Reimbursement for each of the diagnostic methods (yes; no; partial)
- Initial treatment of newly detected ocular hypertension and glaucoma, respectively (no treatment; medical treatment; laser treatment; surgery; if medical therapy, monotherapy or combined therapy first)
- Prescription of generics in ophthalmology (mandatory; some restrictions against prescribing the original product, based on joint decision by the patient and the ophthalmologist; no restriction against prescribing the original medicine)
- Rights of the pharmacist regarding dispensing of glaucoma medication (no right to replace an original product with a generic; the active molecule cannot be changed but any generic equivalent can be dispensed [aut idem rule]; any product with an active ingredient belonging to the same drug class can be dispensed [aut simile rule])
- Prescription of glaucoma medication (exclusively by an ophthalmologist; first always by an ophthalmologist then by the general practitioner; by an optometrist)
- Glaucoma diagnostics and care by institution category (university department; hospital department; private practice) for appropriateness, economic use of resources, equality for everyone

Statistics

The results were calculated for all responding countries for each question and are presented in absolute numbers or in percent values, as appropriate. Only descriptive statistics are given.

Results

Completed questionnaires were returned for 24 countries (Tab. I). However, due to the significantly different regulations and health care systems, a clear answer to all questions was not possible for several countries; therefore the number of responding countries varied across the questions.

TABLE I - Countries for which a completed questionnaire was returned

Albania	Macedonia
Austria	Netherlands
Belgium	Portugal
Czech Republic	Romania
Denmark	Russia
Finland	Serbia
France	Slovakia
Germany	Slovenia
Greece	Spain
Hungary	Sweden
Ireland	Switzerland
Lithuania	United Kingdom

Glaucoma patient organizations and resident education

In 2015, a glaucoma patient organization exists in 13 of the 23 responding countries (57%). The typical waiting time for an ophthalmology resident position is ≤6 months in 9 of the 23 responding countries (39.1%), varies between 6 and 12 months in 4 countries (17.4%), and is longer than 2 years in 4 countries (17.4%). For 6 countries (26.1%), nationwide data were not available. The length of education and training prescribed for ophthalmology specialization varies between 3 years (Lithuania, 4.2%) and 7 years (United Kingdom including subspecialty training, 4.2%). Ophthalmology residency lasts 4 years in 8 of the 24 countries (33.3%), 5 years in 12 countries (50%), and 6 to 6.5 years in 2 countries (8.3%).

Glaucoma diagnostics and care

Direct access to an ophthalmologist in nonemergency cases is possible in 11 of the 24 countries (45.8%). Access via the patient's general practitioner is the rule in 5 countries (20.8%), via the general practitioner or an optometrist in 1 country (4.2%), and via an optometrist in 1 country (4.2%). No systematic route is set in 6 countries (25.0%).

The availability and use of the various diagnostic methods and instruments for cross-sectional glaucoma diagnostics are shown in Table II, and for glaucoma follow-up examinations in Table III. Table II shows that for cross-sectional diagnostics, slit-lamp examination, Goldmann applanation tonometry, and standard automated perimetry are used in nearly all cases in all responding countries. In contrast, of the structural tests (disc photography, scanning laser tomography, scanning laser polarimetry, and OCT), only FD/SD OCT is relatively frequently used. The figures are similar for glaucoma follow-up, but Table III shows that the structural methods

TABLE II - Use of and access to diagnostic tools and instruments for glaucoma diagnostics

Method	Frequency of use		
	Always	Frequently	Seldom/never
Slit-lamp (n = 21)	20	1	0
Goldmann tonometry (n = 20)	11	6	3
Other tonometers (NCT, iCare, Schiotz, Maklakov) (n = 7)	4	3	0
SAP (n = 21)	15	5	1
Goldmann kinetic perimetry (n = 14)	0	0	14
Pachymetry (n = 16)	2	8	6
Gonioscopy (n = 18)	3	10	5
Disc photography (n = 21)	1	10	10
TD OCT (n = 12)	0	0	0
FD/SD OCT (n = 12)	0	9	3
Scanning laser tomography (n = 15)	1	3	11
Scanning laser polarimetry (n = 14)	0	3	11

FD/SD OCT = Fourier-domain and spectral-domain optical coherence tomography; NCT = noncontact tonometry; SAP = standard automated perimetry; TD OCT = time-domain optical coherence tomography.

TABLE III - Use of and access to diagnostic tools and instruments for glaucoma follow-up

Method	Frequency of use		
	Always	Frequently	Seldom/never
Slit-lamp (n = 19)	18	1	0
Goldmann tonometry (n = 19)	14	3	2
Other tonometers (NCT, iCare, Schiotz, Maklakov) (n = 10)	2	8	0
SAP (n = 21)	18	3	0
Goldmann kinetic perimetry (n = 19)	3	4	12
Pachymetry (n = 12)	2	7	3
Gonioscopy (n = 13)	2	8	3
Disc photography (n = 15)	6	4	5
TD OCT (n = 18)	0	0	0
FD/SD OCT (n = 18)	1	9	8
Scanning laser tomography (n = 18)	3	4	11
Scanning laser polarimetry (n = 16)	0	0	16

FD/SD OCT = Fourier-domain and spectral-domain optical coherence tomography; NCT = noncontact tonometry; SAP = standard automated perimetry; TD OCT = time-domain optical coherence tomography.

are somewhat more frequently used for follow-up than for primary diagnostics. Use of time-domain OCT was not reported for any country in 2015. The most commonly used imaging method is FD/SD OCT in all countries. The typical European percentage distribution of the clinical use of FD/SD OCT, scanning laser tomography (Heidelberg retina tomography), and scanning laser polarimetry (GDx) is 60%/10%/5% (22 countries). The distribution varies between 30%/0%/0% (some eastern European countries) and 100%/25%/25% (some western European countries).

The typical frequency of visual field testing in glaucoma eyes without rapid progression is maximum 1 test per year in 12 of the responding 23 countries (52.2%), and 1 to 2 tests per year in 9 countries (39.1%). More frequent testing is typical in only 2 countries (8.7%). The corresponding figures for imaging (all methods) are 9 countries (39.1%) for maximum 1 test per year, 11 countries (47.7%) for 1 to 2 tests per year, and 3 countries (13.0%) for more frequent testing.

Reimbursement for glaucoma care

Data for the reimbursement of clinical investigation tests were available for 21 countries. All tests are separately reimbursed in 9 countries (42.9%), a whole package reimbursement is made in 1 country (4.8%), slit-lamp examination, tonometry, pachymetry, gonioscopy, and standard automated perimetry are reimbursed but disc photography and imaging tests are not reimbursed in 10 countries (47.5%), and in 1 country (4.8%) all tests except for tonometry are partially reimbursed.

Glaucoma treatment and regulations on use of ophthalmic generics

The initial treatment of ocular hypertension is medical in 20 of the responding 23 countries (87.0%), while in 3 countries (13.0%) observation without treatment is typical. The initial treatment of primary open-angle glaucoma is medical in all 23 countries (100%). When initial treatment is medical, it is monotherapy in 21 countries (91.3%). Prescription of generics (when available) is mandatory in 8 of the 22 responding countries (36.4%), while it depends on the joint decision of the patient and the ophthalmologist in 10 countries (45.4%). In 4 countries (18.2%), there is no restriction on prescribing the original product. In 10 of the 23 countries (43.5%), the pharmacist has no right to replace the product when an original medicine is prescribed. The aut idem rule is followed in 12 countries (52.2%), and the aut simile rule in 1 country (4.3%).

Of the 21 countries with homogeneous internal regulations for prescription of glaucoma medication, only ophthalmologists are allowed to prescribe intraocular pressure (IOP)–lowering drugs in 8 countries (38.1%). Prescription initially by an ophthalmologist and then by the patient's general practitioner is possible in 12 countries (57.1%). In 8 of these 12 countries, the regulation covers all glaucoma medications, while in 4 countries only certain IOP-lowering medications can be prescribed in this way. In 1 country (4.8%), as an additional option, prescription of the IOP-lowering medication by optometrists is also possible.

Level of glaucoma care across eye service types

The respondents rated university eye departments, hospital eye departments, and private ophthalmology offices for their glaucoma-related activities, respectively. An appropriate service that is economical and equal to all patients was indicated for university eye departments in 18 of the 19 responding countries (94.7%), for hospital eye departments in 16 countries (84.2%), and for private clinics in 13 countries (68.4%). According to the respondents, too many tests are typically carried out in only 1 of the 17 responding countries (5.9%) in university and hospital eye departments, respectively, and in 3 countries (17.7%) in private clinics. Too few examinations or excessively late interventions were indicated for university eye departments in 2 of the responding 16 countries (12.5%), for hospital eye departments in 3 countries (18.8%), and for private clinics in 8 countries (50%). The less favorable evaluations of private clinics were from some eastern European countries.

Discussion

We report on the results of the survey made by the EGS Delivery of Glaucoma Care Committee in 2015, in order to explore the current status of glaucoma care in Europe. We wished to analyze the potential obstacles to uniformly high-level glaucoma diagnostics and care in Europe. Since no detailed formal information on typical real-life glaucoma practice across the various European counties is available, we contacted the national representatives of EGS (1 person per country) with a questionnaire, and asked them to complete it after an appropriate search through the corresponding national regulations and exploration of the typical routine clinical practice in their own country. Though this approach is limited by lacking formal information on several aspects of glaucoma care, and in some cases regional differences or differences within multinational states exist for both clinical care and reimbursement rules, the data provided by the country representative experts characterize the main features of resident education, glaucoma diagnostics and care, reimbursement rules, use of generic glaucoma medications, and the level of service offered by the different eye service categories.

When the responses were analyzed and summarized for all responding countries, we found 2 main groups of answers. The smaller group involves questions addressing those diagnostic and treatment issues that are (1) more or less uniformly affordable in the European countries and (2) dependent on the physician's decision. This category comprises general and regular use of basic clinical examination methods needed to diagnose and follow glaucoma (slit-lamp examination, tonometry); use of automated threshold perimetry at the time of the diagnosis and during follow-up; 1 or 2 visual field tests per year during follow-up in stable/slowly progressing glaucoma; and initial medical treatment of ocular hypertension and newly detected primary open-angle glaucoma. The responses show a uniform European practice, which follows the recommendations of the current EGS Guidelines (5).

In contrast, the other, larger group of answers shows considerable between-country differences, and also differences between some regions of Europe. Ophthalmology resident training ranges between 3 and 7 years; access to an ophthalmologist is direct in approximately half of the responding countries, while it requires referral by an ophthalmologist, a general practitioner, or an optometrist, or is unregulated, in the other half of the countries; a glaucoma patient organization exists in only 57% of the countries; in approximately half of the responding countries no structural test (disc photography, FD/SD OCT, polarimetry, or scanning laser tomography) is made at the time of diagnosis, thus detection of structural progression may remain insufficient; common use of non-Goldmann-type tonometers represents a convenient and affordable option in certain developed countries (e.g., use of the iCare tonometer), and the only available or only affordable option in some less developed countries (use of the Schiotz tonometer or Maklakov tonometer); Goldmann kinetic perimetry is still frequently used for glaucoma follow-up in approximately 40% of the respondent countries; in approximately half of the countries, disc photography and imaging tests are not reimbursed; use of generics is mandatory in more than one-third of the countries; in pharmacies, the aut idem rule applies in more than half of the countries; and the rules for prescription of ophthalmic products are diverse.

Recently it has been shown that European ophthalmologists perform suboptimally in detection of glaucomatous structural and functional damage, and their performance shows considerable variation by country (6, 7). One may speculate that ophthalmologists from countries with shorter resident training, less optimal technology access, less reimbursed clinical tests, and more restrictions on glaucoma treatment have less access to practical education, use of modern technology, and some IOP-lowering medications than their colleagues who work in countries with fewer restrictions and better access to modern technology. At the same time, it is worth mentioning that no country representative reported on the use of time-domain OCT, thus in this respect all countries are similar.

Finally, we asked the national representatives to evaluate the level of glaucoma diagnostics and care for appropriateness, economical use of resources, and equality to all patients for university eye departments, hospital eye departments, and private clinics. Both university and hospital departments were highly ranked in all aspects, but the scores for private clinics were considerably lower. The evaluation of the private clinics, however, was not uniform across the European countries: the less favorable scores were from certain eastern European countries, which suggests a considerable regional difference in the level of care offered by at least some of the private ophthalmology practices.

Our study has limitations. As discussed earlier, exact data are not available for several aspects of routine glaucoma care in certain European countries, and routine practice may vary even within the same state. To overcome these objective limitations, the use of responses and comments by the country representative experts remains the only solution. Another limitation of the current survey is that no completed questionnaires were returned from several European countries. Since we repeatedly contacted the country representatives from the nonresponding countries but received no response,

information for the missing countries could not be included in the current analysis.

In conclusion, the survey of the EGS Delivery of Glaucoma Care Committee shows significant diversity in resident training, glaucoma diagnostics and care, reimbursement, and use of generic glaucoma medications across the European countries, while those components of clinical practice that are affordable in all countries and predominantly depend on the decision of the ophthalmologists follow a common pattern that complies with EGS guidelines. To reduce between-country differences and to provide a higher level of glaucoma care in Europe, more resources and focused allocation of resources are required in several European countries.

Disclosures

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