УМЕНИЯ И НАВИЦИ НА МЛАДИТЕ ОФТАЛМОЛОЗИ ЗА ДИАГНОСТИКА НА ГЛАУКОМАТА

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SKILLS AND HABITS OF YOUNG OPHTHALMOLOGISTS IN THE DIAGNOSTICS OF GLAUCOMA

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РЕЗЮМЕ

Въведение: В световен мащаб глукомата е втората водеща причина за слепота. Диагностиката на заболяването, особено в начален стадий, често представлява затруднение за младите офталмолози. Адекватната съвременна диагностика изисква множество познания, умения и включва различни високотехнологични апаратни методи. В България липсват данни за използваните от специализантите и младите офталмолози методи за изследване, диагностика и лечение на глаукомата, както и трудностите, които могат да повлияят качеството на здравната грижа.

Цел: Основната цел на проучването е да осигури информация относно практикуваните методи за мениджиране на заболяването глукома от специализантите и млади офталмолози в България, както и потенциалните трудности и проблеми, които могат да повлияят качеството на здравната грижа.

Методи: Използван е анкетният метод, чрез попълване на подробни анонимни въпросници относно работното място, използваната апаратура, методите за изследване, потенциалните слабости в диагностицирането и мениджирането на заболяването. Анкетирани са специализантите и млади специалисти по очни болести с опит до 5 години чрез електронна поща и с помощта на социални мрежи.

Резултати: Бяха изпратени 120 анкети, като попълнените коректно и изпратени навреме са 45, всичките на млади офталмолози от различни части на България. От тях 30 се определят като специализанти (66.7%), а 15 като специалисти с до 5 години опит (33.3%). Относно броя на преглеждания глаукомни пациенти 27 от участниците (60.0%) посочват, че преглеждат до 5 пациенти, 14 (31.1%) до 10, а само четирима (8.9%) менежират до 20 глаукомни пациенти на ден. Тридесет и четири от участниците (75.6%) посочват въздушен тонометър като основен метод в практиката им. 11.1% от анкетираните никога не са извършвали гониоскопия, а 4.4% са опитвали, без успех. Едва 11 (24.4%) от участниците посочват, че не извършват затруднения при извършване на гониоскопия. Предпочитан способ за определение дълбочината на предна камера се оказва методът на Van Herick (51.1%). Относно извършването на периметрия, 43 (95.6%) от участниците винаги изискват наличието на изследване при поставяне на диагнозата глаукома, а 39 (86.7%) от тях посочват, че

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Винаги извършват апаратно изследване за оценка на зрителия нерв и неврофибрилерния слой. Петнадесет от анкетираните (33.3%) (от тях 12 специалисти) никога не са асистирали на антиглукомна операция. Тридесет и осем (84.4%) от участниците смятат, че трябва да се провеждат повече обучения и семинари, свързани със заболяването глукома.

Заключение: Глукомата представлява предизвикателство както за лекари, така и за пациенти. Идентифицирането на потенциалните затруднения и пропуски при обучението на специализираните по офталмология и младите специалисти, както и осъществяването на обратна връзка с тях, е от съществено значение за правилно мениджиране на заболяването в национален мащаб.

Ключови думи: глукома, специализанти офталмологи, умения, млади офталмологи, измерване на ВОН, гониоскопия

ABSTRACT

Introduction: Globally, glaucoma is the second leading cause of blindness. The diagnosis of the disease, especially at an early stage, is often an occupational challenge for young ophthalmologists. Adequate diagnostics requires a comprehensive ophthalmologic examination that is related to a broad range of knowledge, skills and various high-tech devices. Bulgarian scientific literature does not offer information about the currently used methods for treatment and diagnosis by residents and young ophthalmologists; there is also no detailed information about the difficulties that ophthalmologists experience in the management of the disease.

Aim: The main goal of this study is to provide information about the methods used for the management of glaucoma by residents and young ophthalmologists in Bulgaria, as well as data on the potential difficulties and problems that may reduce the quality of health care.

Methods: Detailed anonymous questionnaires about workplace, used equipment, methods of investigation, potential weaknesses in the diagnosis and management of the disease, as well as personal attitude towards the problems in the field, were sent to residents and young ophthalmologists with experience of up to 5 years by e-mail and with the help of social networks.

Results: One hundred and twenty questionnaires were sent but only 45 individuals responded to the survey. Of these, 30 were classified as residents (66.7%) and 15 as specialists with up to 5 years of experience (33.3%). Regarding the number of glaucoma patients examined, 27 of the participants (60.0%) indicated that they have examined under 5 patients who suffer from glaucoma or are suspected of glaucoma, 14 (31.1%) under 10 and only four (8.9%) managed less than 20 glaucoma patients per day. Thirty-four of the participants (75.6%) mentioned air tonometry as the main method in their practice. Eleven percent of the participants never performed gonioscopy, and 4.4% had tried but failed. Only 11 (24.4%) of the participants said they had no difficulty performing gonioscopy. A preferred method of determining the depth of the anterior chamber was Van Herick’s method (51.1%). Regarding perimetry, 43 (95.6%) of the participants always required the presence of a glaucoma diagnosis, and 39 (86.7%) reported that they always performed a visual examination to evaluate the optic nerve and the neurofibrillary layer. Fifteen respondents (33.3%) (of them 12 residents) never assisted in an anti-glaucoma operation. Thirty-eight (84.4%) of the participants found a need for more trainings and seminars on glaucoma.

Conclusion: Diagnosis of glaucoma is a challenge for doctors as well as for patients. Identifying potential weak spots among ophthalmology residents and young professionals and obtaining sufficient feedback is essential to improve the proper management of the disease nationwide.

Keywords: glaucoma, residents in ophthalmology, skills, young ophthalmologists, IOP measurement, gonioscopy
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INTRODUCTION
Globally, glaucoma is the second leading cause of blindness (1). According to WHO, the number of patients with blindness due to glaucoma is 4.5 million (1). Primary open- and closed-angle glaucoma account for about half of all cases of glaucoma. Together, they are the leading cause of irreversible loss of sight in the world (2).

The actual incidence of glaucoma may be higher as it is believed that more than half of glaucoma patients are not diagnosed (3-5). Because there might be no visual complaints, the disease should be known in detail by eye health specialists (2,6,7). Early detection and treatment represent the key to preventing blindness as a result of glaucoma damage and preservation of patients’ quality of life (8,9).

The challenges of glaucoma management are diversified. Detection of the disease, especially in the pre-perimetric stage, is sometimes a difficulty for young ophthalmologists (10). Adequate diagnosis requires a comprehensive eye examination including evaluation of the optic nerve by ophthalmoscopy and high-tech equipment and assessment of peripheral visual function by perimetry (2). Reduction of intraocular pressure (IOP) by medications, laser, and surgical procedures remains the only clinically proven method for glaucoma management (11). Therefore, it is essential to determine properly IOP, which requires the availability of specialized equipment (12-14). The evaluation of the optic nerve through ophthalmoscopy is associated with the need of knowledge and experience, and its examination through specialized imaging methods is directly dependent on the resources of the given medical institution. To determine the diagnosis of glaucoma, performance of gonioscopy is essential, which, in the context of a daily routine, often remains neglected and sometimes inadequately replaced by anterior segment optical coherence tomography (AS-OCT) (15). It is essential to select individualized therapy as well the monitoring of disease progression over time (2).

All these features define glaucoma as challenging for young ophthalmologists in Bulgaria, which necessitated the conduct of this study.

There is a lack of detailed information of demographic characteristics of glaucoma in Bulgarian scientific literature. There is no feedback from residents and young ophthalmologists about the methods they use for diagnosis and treatment of the disease, as well as the difficulties they experience in the management process.

AIM
The main goal of this study is to provide information about the methods used for the management of glaucoma by residents and young ophthalmologists in Bulgaria, as well as data on the potential difficulties and problems that may reduce the quality of health care.

METHODS
The current study was conducted on an online platform (eSurveyCreator.com). In February 2019, detailed anonymous questionnaires about workplace, used equipment, methods of investigation, potential weaknesses in the diagnosis and management of the disease, as well as personal attitude towards the problems in the field, were sent to residents and young ophthalmologists with experience of up to 5 years by e-mail and with the help of social networks (Facebook, Instagram). The questionnaire consisted of 16 closed-ended questions, some of the questions with the option to provide additional information from the participant. Exclusion criteria included clinical experience of

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Основната цел на проучването е да осигури информация относно практикуваните методи за мениджиране на заболяването глукома от специалистите и млади офталмологи в България, както и потенциалните
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затруднения и проблемы, которые могли бы повлиять на качество здравной грижы.

МЕТОДИ
Настоящее изучение было проведено через онлайн-платформу (eSurveyCreator.com). В феврале 2019 г. было приготовлено и подано анонимное исследование, включающее вопросы о рабочем месте, используемом оборудовании, методах диагностики и менеджмента, а также о персональных отношениях специалистов. Единым критерием для исключения был наличие клинического опыта более 5 лет после специализации по офтальмологии и отсутствие ответов на все вопросы. Каждый участник мог заполнить анкету только один раз. Анализ выполнен со статистическими пакетами для социальных наук (SPSS) версии 19 (IBM Corp., Armonk, NY).

РЕЗУЛЬТАТЫ
Было отправлено 120 анкет, но только 45 верно и вовремя были возвращены, это все молодые офтальмологи из различных частей Болгарии. Из них 30 были классифицированы как резиденты (66.7%), 15 как специалисты с до 5 лет опыта (33.3%). Распределение участников по местам работы варьировало, большая часть из них (18 или 40.0%) заявила, что практикует в частной больнице, 12 (26.7%) в университетской больнице, 11 (24.4%) в государственной или муниципальной больнице, 3 (6.7%) в медицинском центре и один (2.2%) - в свободной практике. Результаты представлены на рис. 1.

В отношении количества пациентов с глаукомой, 27 участников (60.0%) ответили, что они обслуживают до 5 пациентов с глаукомой, 14 (31.1%) до 10, а только 4 (8.9%) больше 20.

Интересной особенностью было обнаружено, что только 11 участников (24.4%) ответили, что они регулярно делают гониоскопию, 12 (26.7%) делают это раз в месяц, а остальные всего 5–6. Из них 4 (8.9%) никогда не делали гониоскопию.

Гониоскопия помогла 9 участникам (20.0%) определить глубину передней камеры, а 23 (51.1%) предпочли метод Генри. 12 (26.7%) использовали AS-OCT, а для одного (2.2%) хватило обычного микроскопа. В отношении периметрии, 43 (95.6%) всегда требовали эту процедуру, а только 2 (4.4%) не делали ее.

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over 5 years after ophthalmology specialty and lack of answer to all questions. Each participant’s IP address was registered by the system and he or she could only complete the survey once. Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) version 19 (IBM Corp., Armonk, NY).

RESULTS
One hundred and twenty questionnaires were sent, but only 45 individuals responded to the survey. Of these, 30 were classified as residents (66.7%) and 15 as specialists with up to 5 years of experience (33.3%). The distribution of participants by workplace varied as the majority of respondents 18 (40.0%) reported that they practiced in a private hospital, 12 (26.7%) in a university hospital, 11 (24.4%) in a state or municipal hospital, 3 (6.7%) in a medical center and one person (2.2%) - in private practice. The results are presented in Fig. 1.

Regarding the number of glaucoma patients examined, 27 of the participants (60.0%) indicated that they examined up to 5 patients who suffered from or were suspected of glaucoma, 14 (31.1%) up to 10 and only four (8.9%) managed less than 20 glaucoma patients per day.

Interesting observation of how routine IOP has been identified: 34 of the participants (75.6%) indicated air tonometry as the main method in their practice. Seven of the respondents (15.6%) used Goldmann’s tonometry (including Perkins). Two respondents (4.5%) preferred use of an iCare tonometer, one participant (2.2%) combined three methods air tonometer, Perkins and Tonopen, and one (2.2%) pointed to Maklakoff tonometry as the method of choice. No participant practiced Schiotz tonometry and palpatory IOP determination. The results are presented in Fig. 2.

When questioned: „Have you ever done a gonioscopy?” only 11 participants (24.4%) answered unequivocally positively, 12 (26.7%) said they often did the examination, 15 (33.3%) tried several times. Two of the respondents (4.4%) reported that they had tried, but unsuccessfully, and five (11.1%) never performed gonioscopy (Fig. 3).

Only 11 (24.4%) of the participants indicated they had no difficulty performing gonioscopy (Fig. 4). No statistically significant correlation between the ability to perform gonioscopy and skill levels (specialty) was encountered.

Gonioscopy helped 9 participants (20.0%) to determine the depth of the front chamber, while 23 (51.1%) preferred the Van Herick method. Twelve (26.7%) used AS-OCT for this purpose, and for one (2.2%) biomicroscopic cut of the anterior chamber is sufficient (Fig. 5).

Regarding the performance of perimetry, 43 (95.6%) always required this examination for glaucoma diagnosis and only two of
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In the study, respondents were asked if they had ever performed a gonioscopy. The results are shown in Fig. 3. The study participants indicated their answers on a scale from 0 to 16.

The respondents were also asked if they had ever performed an ophthalmic examination of the optic nerve and neurofibrillary layer. The results are shown in Fig. 4. The data were presented in Fig. 2.

When asked if they had ever performed perimetry, 43 (95.6%) of the respondents said yes, indicating that this method is a major difficulty in diagnosing glaucoma. The remaining results are presented in Fig. 6.

It is interesting to note that 15 of the participants (33.3%) have never assisted in an anti-glaucoma operation, while 19 (42.2%) were assistants in less than 10 disease management operations and only 11 (24.4%) - in over 10 operations.

A question from the survey on weaknesses in the management of the glaucoma revealed many problems associated with it. The answers are presented in Fig. 7.

It is not surprising that 38 (84.4%) of the participants believe that more glaucoma trainings and seminars should be performed.
The survey covers almost half of the postgraduates and a sample of young ophthalmologists in Bulgaria, and despite the small number of data they are indicative.

When determining IOP, 34 of the participants (75.6%) indicated the air tonometer as a routine measurement method. One participant (2.2%) reported that he practiced the morally outdated Maklakoff tonometry method. It is encouraging, however, that no participant has practiced Schiotz tonometry and palpatory IOP determination. Numerous studies have demonstrated that there is a significant difference in IOP measurement between Goldmann’s applanation tonometry and air puff tonometry (12,16). According to the World Glaucoma Association, Goldmann’s applanation tonometry is the most appropriate and reliable method for measuring IOP and is defined as the “gold standard” (2). Since IOP measurements obtained by applanation tonometry usually show rates higher than those obtained with air-puff tonometry, regardless of age and gender, air tonometry is a suitable method for IOP screening (16). Maklakoff’s tonometry is an outdated method used in the past that is considered inaccurate (17).

Another concern for young ophthalmologists is the evaluation of the anterior chamber angle, as 33.3% of the participants reported that they had tried to perform gonioscopy, 4.4% said they had tried, but the result was unsuccessful, and 11.1% had never performed gonioscopy. Only 24.4% of the participants are confident that they have no difficulty performing gonioscopy. It is not by accident that, according to the data obtained, gonioscopy is the main difficulty among the young ophthalmologists, with 50% indicating this method as a major problem in the process of diagnosing glaucoma. Mastering gonioscopy is essential, not only in assessing patients’ risk of angle closure after dilation but also in diagnosing and subsequently treating acute and chronic glaucoma and various anterior surface diseases (18). It is alarming that Goldmann’s tonometry is not performed by residents, despite the lower cost of the equipment.

Regarding the performance of high-tech equipment such as perimetry, the results are encouraging, although there are still large medical institutions (4.4% of those who reported that they did not have access to such devices were working in state hospitals) who do not possess such equipment.

DISCUSSION

The survey covers almost half of the postgraduates and a sample of young ophthalmologists in Bulgaria, and despite the small number of data they are indicative. When determining IOP, 34 of the participants (75.6%) indicated the air tonometer as a routine measurement method. One participant (2.2%) reported that he practiced the morally outdated Maklakoff tonometry method. It is encouraging, however, that no participant has practiced Schiotz tonometry and palpatory IOP determination. Numerous studies have demonstrated that there is a significant difference in IOP measurement between Goldmann’s applanation tonometry and air puff tonometry (12,16). According to the World Glaucoma Association, Goldmann’s applanation tonometry is the most appropriate and reliable method for measuring IOP and is defined as the “gold standard” (2). Since IOP measurements obtained by applanation tonometry usually show rates higher than those obtained with air-puff tonometry, regardless of age and gender, air tonometry is a suitable method for IOP screening (16). Maklakoff’s tonometry is an outdated method used in the past that is considered inaccurate (17).

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Sources of difficulty in diagnosing glaucoma are varied, as previously mentioned, gonioscopy is the leading cause of confusion (50%), followed by RNFL assessment, optic nerve assessment, and reading of the perimetry results. Only 4.5% of respondents pointed to OCT / structural examination reading as a problem.
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Sporeg Svetobchata glaukoma asociatsiya alplanatsionnatata tonometriia na Goldmann predstavlia naoprodhovatnost i nadzhen metod za izmervane na VON i se opredeli kato „zlaten standard“ (2). Tova qto izmervannaata na VON, polucheni chrez alplanatsionna tonometriia, obinkoveno so postoski ot poluchennieostoysnosti s vyzhushchatonometriia, nesizamno ot razlichnata v vobrazost i plokh, vyzhushchatonometriia i nadezhden metod osobno za skrini na VON (16). Tonometriia po Maklakow predstavlia alplanatsionen metod, izpolzovan 6 minuloto, i e dazhano netochnot (17). Trebovanite e faktit, qto tonometriia na Goldman na praktika ne se praktikuva ot mladite spetsialisti, nesizamno ot po-niskata cena na aparaturata.

Drugo pritespishime noobrashchenie e svyrazano s izlesdvaneto na prednokameretno vstoto na mladite oftalmolozi, kato 33.3% ot участниците, ce so optimali za izvryvati gonoiskopiia, 4.4% posvyachav, ce so optimali, no bez uspek, a 11.1% nikogo ne se izvryvali gonoiskopiia. Egeva 24.4% ot участниците su uveneni, qto ne izpolzuyut nikakvi zapryvaniia pri izvryvaneto na gonoiskopiia. Nesluchavo, sporeg poluchennie danyi gonoiskopiia je yavlia otsochnata obstrukciia sred mladite oftalmolozi, kato 50% posvyachav tova izlesdvaneto kato vodece zapryvanie pri izlesdvaneto na glaukomi pacientata. Obzarvaneoto na gonoiskopiia e ot svesstvenno znachenie, ne samo pri ocenka na risksa na pacientata za zapryvanie na prednokameren vstot, no i pri diagnostikiirane i poshlevane lechenie na ostri i kronichni glaukomi i razlichni zabolevania na prednyi segment (18). Na baza na tova pruchuvame, qto ne may dem, qto ot oftalmoloziite propltat mozii metod na izlesdvaneto v svoeto praktika.

Otnosno izvryvaniem na aparatu izlesdvanii rezultatite su obnageskavaщи. Vopreki ce se oksava, qto vse oche ime glomelii lechebni zabrevenia (4.4% ot участниците, posvyachav, ce ne razpolagat s takava aparatura, sas ot drzhavni bolnicii), koito ne so ocusurii takva.

Izpolnichenieto na zapryvanieto pri postavenieto na diagnoiata glaukoma se okazali raznoobrazni, qato, kakoto vache be spomenato, gonoiskopiia zavota vodece mesto (50%), sledvanna ot ocenka na RNFL, ocenka na zravnite nervi i razchitaneto na perimetreiiata. Samo 4.5% ot anketeriiranei posvyachav razchitaneto na OCT/strukturchno izlesdvaneto kato problem.

Drugo pritespishime aspekt e ogranichenieto dostup do uchebna v antyglaukomyi chirurgichni uchertjenii po vreme na obuchenioto. Cem po anketeriiranei nikoga ne se aksistirali na antyglaukomyi operaciia, kato ot tochka 12 sa spezializanti. Sporeg izlesdvaneta na M3 beski kanditat za izlup za spezialnost pribyva da aksistira na 40 i da izviri samopolezno 10 antyglaukomyi operaciia.

Vseki izletsjatini rezultati svoditevstvat na menenieto na 84.4% ot anketeriiranei, qto svesstvuba nuzha ot proyvkaane na pobche obuchen i seminar, koito da oboznati poznanite i razvitiet umenieta za diagnostika i lechenie na zabolevaneto glaukoma.

Another worrying aspect is limited access to anti-glaucoma interventions by young ophthalmologists. Overall, 33.3% of respondents have never assisted in an anti-glaucoma operation. According to the requirements of the Ministry of Health, each candidate for a specialty exam must assist on 40 and perform 10 anti-glaucoma operations independently. The results correspond to the opinion of 84.4% of participants that there is a need for more trainings and seminars in order to improve the knowledge and develop skills for diagnosis and treatment of glaucoma.

**CONCLUSION**

Diagnosis of glaucoma is a challenge for doctors as well as for patients. Identifying potential weak spots among glaucoma residents and young professionals and obtaining sufficient feedback is essential to improve the proper management of the disease nationwide.

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ЗАКЛЮЧЕНИЕ
Глаукомата представлява предизвикателство както за лекари, така и за пациенти. Идентифицирането на потенциалните затруднения и пропуски при обучението на специализантите по офталмология и младите специалисти, както и осъществяването на обратна връзка с тях, е от съществено значение за правилно менажиране на заболяването в национален мащаб.

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