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**ABSTRACT**

of the dissertation for the degree of Doctor of Philosophy

**THE ROLE OF FAMILY DOCTOR IN PRIMARY HEALTH  
CARE ON OPHTHALMOPATOLOGY AND EARLY DIAG-  
NOSTICS OF GLAUCOMA**

Speciality: 3212.01- Health care and its organization

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## General concept of the study

***Relevance of the topic and stages of development.*** The practice of family medicine – the traditional system of primary medical and sanitary aid in many countries – has different types, different functions and participates in solving of problems of modern health care system<sup>1,2,3</sup>. The breadth and depth of the tasks solved by family doctors determines the requirements for their professional skills and knowledge, on the basis of which a system of training of specialists for family practice and the material and technical equipment of general practitioners' offices is formed. In Russia, which has a traditional zemskaya (local) medical practice, the family medicine appeared in post soviet period and replaced the district health service. The Russian model of family doctor is intended for the provision of preventive and primary medical and diagnostic care for internal, surgical, gynecological, otorhinolaryngological, ophthalmological, dermatovenerological and other diseases. There is undergraduate and post-graduate training for family doctors, the qualification characteristics of which intend the ability to conduct examination, diagnosis, treatment and rehabilitation of patients, organize additional examination, consultation and hospitalization of patients with diseases of the respiratory system, circulatory system, digestion and blood formation, endocrine, urinary system, female genital organs and mammary gland, joints and connective tissue, ear, throat, nose, eyes, organs of oral cavity, as well as infectious (including tuberculosis) pathologies if it is necessary. In the field of ophthalmology, the competence of a general practitioner in Russia covers the skills of diagnosis and treatment of inflammatory diseases (conjunctivitis, blepharitis,

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<sup>1</sup> Щепин В.О., Иванов М.В., Миргородская О.В., Проблемы социальной гигиены, здравоохранения и истории медицины, 2011. № 1. с. 38 – 42

<sup>2</sup> Taylor J.L., Aalasma M.C., Gilbert A.L. et.al. Perspectives of family medicine physicians on the importance of adolescent preventive care: a multivariate analysis // BMC Family Practice, 2016, 17:4

<sup>3</sup> Banfield M., Jowsey T., Parkinson A. et.al. Experiencing integration: a qualitative pilot study of consumer and provider experiences of integrated primary health care in Australia // BMC Family Practice, 2017, 18:2

dacryoadenitis, dacryocystitis, keratitis, barley), glaucoma, refractive errors (myopia, hyperopia, presbyopia), strabismus, cataracts. There are scientific studies on improving the efficiency of family doctors in general<sup>4,5,6</sup> and in the field of ophthalmopathology<sup>7,8,9,10,11,12</sup>.

The practice of family medicine in Azerbaijan is on the initial stage of development, there are no regulations for organizing the work of family doctors, although a family doctor is included to the nomenclature of medical staff. Medical University graduates can work as family doctors. But there is no regulated system for pre- and post-graduate education of family doctors. For adequate formation of family medicine practice in Azerbaijan it is necessary to create the scientific grounding of roles and tasks of future family doctors for fulfilment of duties on primary medical and sanitary care on different

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4 Jorgensen J.T., Andersen J.S., Tjouneland A., Andersen Z.J., Determinants of frequent attendance in Danish general practice: a cohort – based cross – sectional study // BMC Family Practice, 2016, 17:9

5 Mortel T., Bird J., Chown P. et.al.General practitioners as educators in adolescent health: a training evaluation // BMC Family Practice, 2016, 17:32

6 Wagner E.H., Flinter M., Hsu C. et.al. Effective team-based primary care: observations from innovative practices // BMC Family Practice, 2017, 18:13

7 Бурлачук В.Т., Крысенкова Н.А., et.al. Офтальмотонометрия в общей врачебной практике (семейной медицине) // Журнал «Поликлиника», 2008, № 5. с. 94 – 96

8 Clement M. et. al. Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada: Organization of Diabetes Care // Can J Diabetes. 2013;37(1):S20–5

9 Приходько В.Ю. Головная боль в практике терапевта и семейного врача. Укр. Мед. ЧАСОПИС, 3 (95) – V/VI 2013/www.umj.com.ua

10 Воронина А.Е. Медико-социальные аспекты заболеваемости глаукомой в Оренбургской области. Автореф. дисс...канд. мед. наук. Оренбург, 2015. 22 с.

11 Амиров А.Н., Зверева О.Г., Транспальпебральная тонометрия при скрининге населения на глаукому // Медицинский альманах, 2016, № 1 (41), с. 88 – 90

12 Зохан А.А., Никифорова Е.Б., Карлова Е.В., Полунина М.А. Организация специализированной офтальмологической помощи пациентам с глаукомой и скрининга на глаукому в отдаленных районах Самарской области // Медицинский альманах, 2016, № 1 (41). с. 85 – 88

medical profiles. That's why, determination of roles of a family doctor at provision of primary health care in ophthalmology and the early detection of glaucoma.

**Object and subject of the research.** The object of the study was a patient with eye pathologies causing the need for primary health care by family doctor. The main subjects of this object were considered as nosological forms of ophthalmopathology (conjunctivitis, blepharitis, dacryoadenitis, dacryocystitis, glaucoma, barley, myopia, astigmatism, presbyopia, strabismus, katarakt) and the professional competence of a family doctor in the diagnosis, treatment and prevention of these diseases.

**The purpose of the study.** scientifically substantiate the role of the family doctor in the provision of primary health care in ophthalmology and the early detection of glaucoma.

**Research objectives:**

- To obtain a modern description of the rate and structure of the general morbidity of the population with diseases of the organs of vision based on the materials of treatment in medical institutions (on the example of the Yasamal district of Baku);
- In-depth study of the medical and social burden (incidence, prevalence, comorbidity, disability) of glaucoma on the state of primary health care;
- To study the potential for the participation of a family doctor in the medical care of patients with eye diseases and their adnexa;
- To substantiate the role of the family doctor in the provision of primary health care for ophthalmopathology and early detection of glaucoma.

**Methods of the study. Clinical:** general clinical ophthalmological examination, physical examination (vizometry, tonometry, ophthalmoscopy, eye biomicroscopy, gonioscopy, ophthalmometry, keratometry, perimetry, refractometry and others).

**Social and hygienic:** methods for studying primary and general morbidity, disability; expert assessment of the quality of diagnosis, examination and treatment.

**Statistical:** descriptive statistics of quantitative and qualitative indicators, estimation of statistical significance by  $\chi^2$  criteria and variance; descriptive statistics of quantitative and qualitative indicators, estimation of statistical significance by  $\chi^2$  criteria and analysis of variance; correlation and regression analysis. analysis; correlation and regression analysis.

**Normative:** loading rate, attendance and hospitalization rate.

***Provisions of the thesis to be defended.***

- The need for visits to ophthalmologists and family doctors depends on the level and structure of eye diseases and its adnexa, which have features in the city of Baku;
- Glaucoma as the heaviest medical and social burden at the primary health level has features depending on the stage and severity of the pathology, the degree of disability, which significantly affects the degree of participation of the family doctor in the medical care of patients;
- The degree to which a family doctor participates in primary health care in the field of ophthalmopathology depends on the professional competence of the family doctor. When using the Russian model of a family doctor in Azerbaijan per 1000 population, 79.4 visits are expected in connection with primary health care for eye pathologies.

***Scientific innovation of research results:***

- For the first time a characteristic of the morbidity among the population with diseases of the organs of vision is given as the basis for the formation of the need for medical services of a family doctor;
- The features of the primary and general morbidity of glaucoma among the population, its prevalence, disability due to glaucoma are shown to define the role of family doctor in the prevention of glaucoma;
- For the first time, a model has been substantiated to study the potential role of the family doctor in primary health care on ophthalmopathology in Azerbaijan;

- For the first time, the methodology of redistributing the load on medical diagnostic and preventive work for diseases of the organs of vision between family doctors and ophthalmologists is justified.

***Theoretical and practical value of the study results.***

- The study results let us to establish the model of plan for working and communication of family doctors with doctors-specialists, which is useful for governing bodies of the health care system in the transition to family practice of primary health care. Based on results of the study norms of the redistribution of the load between family doctors and ophthalmologists, assistance from health authorities will determine the contingent for family doctors and their responsibilities.
- The results of the study have practical application in the preparation of the program and the list of competencies for family doctors.

***Approbation of a dissertation.*** Results achieved during the study have been reported and discussed in the department of "Organization of health care and management with a course of pedagogy, psychology and a foreign language" of the Azerbaijan State Advanced Training Institute named after A.Aliyev, on the Scientific Council of the Department of Therapy and Medical Prophylactics, at the VI international scientific and practical conference (Moscow, 2017), at the XXI scientific and practical (Saint-Petersburg, 2019, November 15), at the forum "The scientific achievement of the third millennium" (New York, 2019), at the scientific and practical conference devoted to anniversary of A.Aliyev (Baku 2020), at XXIX international scientific and practical conference (Moscow, 2019).

Initial discussion of the scientific work was conducted at the scientific council (joint inter-department conference of staff of the departments of the Azerbaijan State Advanced Training Institute named after A.Aliyev "Organization of health care and management with a course of pedagogy, psychology and a foreign language", "Ophthalmology", "Hygiene" and "Pharmacology (16.11.2018, protocol №22).

Approbation of the theses of the dissertation was conducted at the approbation seminar at the National Ophthalmology Center named after the Academician Z.Aliyeva on February 26, 2021 (protocol №3).

***Application of the study results.*** The study results are applied to the work of the basis polyclinics (polyclinics №3) and education process of the Azerbaijan Medical University and the Azerbaijan State Advanced Training Institute named after A.Aliyev.

***Name of the organization where the study was conducted:*** The Azerbaijan Medical University and the Azerbaijan State Advanced Training Institute named after A.Aliyev.

***The volume and structure of the dissertation.*** Dissertation was written on 179 pages, printed on a personal computer, includes 26 tables, 13 pictures and graphs. The dissertation consists of introduction (9118 characters), literature review (Chapter I - 50328 characters), description of materials and research methods (Chapter II - 20115), 4 chapters (III - 33853 characters, IV - 32340 characters, V - 29487 characters, VI - 24740 characters) of own results, conclusions - 6238 characters, conclusions - 2579 characters, practical suggestions - 1261 characters, a list of references, which includes 288 sources, including 6 in Azerbaijani, 42 in Russian, 240 in English. The total number of characters is 210059.

### **Materials and methods of the study**

In line with the purpose and tasks of the study, the scientific research work was conducted through a phased and comprehensive study aimed at identifying the potential opportunities for the participation of a family doctor in medical diagnostic and preventive and rehabilitation care in the field of ophthalmopathology.

The volume of tasks to be solved covers various aspects of eye diseases, which required the independent formation of a unit of observation and an object of observation for each task.

Studying the total morbidity of diseases of the eye and its adnexa the observation unit was the patients, which has record of an ophthalmologist with a diagnosis and the reason for visiting in ambulatory card. The observation volume was defined by the method of con-



tinuous coverage of all units of observation in polyclinics (№3; 16; 17; 10; 5) of Yasamal district (totally 25308 diagnosis, including 12759 diagnosis among men, and 12549 diagnosis among women). Diagnosis have been grouped in correspondence with classes of the VII International Classification of Diseases (ICD-10).

The significance of differences between the age-sex groups in terms of the overall morbidity rate was determined by the criterion "t".

Dependence of total morbidity rate on age was evaluated according studying variability of morbidity rate indicators (y) in correspondence with serial number of age (x) groups (0-4 – 1; 5-9 – 2; 10-14 – 3; 15-19 – 4; 20-29 – 5; 30-39 – 6; 40-49 – 7; 50-59 – 8; 60-69 – 9; 70 years and older – 10). The relationship between them was estimated by Spearman's rank correlation coefficient ( $\rho$ ).

For describing the tendency line, dependence of morbidity rate on age (serial numbers of age intervals) regression analysis was used.

The results of the first stage of observations (visual disease incidence data) determined the necessity to study the medical and social workload of glaucoma for primary medical and sanitary services. The unit of statistical observation was the patient with the first diagnosed glaucoma in 2016. The object of observation consisted of 421 patients who underwent an in-depth examination at the National Center of Ophthalmology named after academician Z. Aliyeva. The number of previously identified patients was 1475. The total number of people for characterization of patients with glaucoma was 1896. Patients were grouped according to the clinical forms of glaucoma in correspondence with the national guidelines on glaucoma for doctors of polyclinics [E.A.Егоров, Ю.С.Астахов, А.Г.Щуко, 2008<sup>13</sup>].

632 of all patients with glaucoma (1896) have been examined in polyclinics №3 and were registered at the dispensary. These patients were deeply examined to identify chronic diseases of the internal organs (polymorbidity) and diseases of the organs of vision (comorbidity). The list of these patients consisted of 410 men and

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<sup>13</sup> Е.А.Егоров, Ю.С.Астахов, А.Р.Щуко. Национальное руководство по глаукоме (путеводитель) для поликлинических врачей. Москва, 2008, 69 с

222 women, at ages  $\leq 49$  y.o. – 88; 50-59 y.o. – 193; 60 years and older – 351. Composition of patients according to clinical diagnoses: primary OAG - 505; primary CAG - 71; others - 56.

For the assessment of the disability risk factors due to glaucoma, a comparison was made between the medical and social characteristics of disabled (150) patients and able-bodied (482) patients. These groups of patients were divided into subgroups by gender, age, clinical diagnosis, stage of glaucoma, prescription of the pathology.

This information served as a scientific basis for assessment of the potential role of the family doctor in the primary health care of ophthalmic patients. At the same time, there were used analytical, balance sheet and expert assessment methods, with the help of which the medical services that correspond to the competencies of a family doctor, necessary for ophthalmological patients (prophylactic, diagnostic, medical and rehabilitation) were selected. The volume of patients' needs for diagnostic procedures was determined in accordance with the standards for nosological forms.

The need for visits to doctors was determined by the actual requests of patients with the additional participation of experts. These experts were ophthalmologists at a polyclinic, who also assessed the likelihood that family doctors would be able to complete some of these visits, if they had standard competencies in ophthalmological care of patients.

For experimental evidence of the role of a family doctor in the sphere of medical care for ophthalmological patients, a prospective observation was planned with our participation (an ophthalmologist in basic education, an assistant in the Department of Family Medicine) at the base of polyclinics №3 (base of the Department of Family Medicine).

All patients, before being referred to specialist doctors, were involved in eye examination using tonometry according to the Maklakov's method. After tonometry, all patients were examined by ophthalmologist during their treatment by physicians, neuropathologists, dentists and other specialists.

Observation results have been processed by the method of analysis of qualitative characteristics.

### **Characteristics of total morbidity rate of population with eye diseases (according materials of application to medical and prophylactic institutions of Yasamal district, of Baku city)**

The total morbidity rate of visual system diseases was  $109,1 \pm 0,7\%$  ( with 95% confidence interval -  $107,7 - 110,5\%$ ), he value of the indicator in the group of men ( $114,3 \pm 1,0\%$ ; with 95% confidence interval  $112,3 - 116,3\%$ ) and women ( $104,3 \pm 0,9\%$ ; 95% confidence interval  $102,5 - 106,1\%$ ) were significantly different ( $P < 0,05$ ), the total morbidity risk in group of men was higher (the relative risk - 1,1; attributive risk - 10,0%).

The first place according the frequency among diseases of the organs of vision is occupied by diseases of the muscles of the eye, disturbances in the friendly movement of the eyes, accommodation and refraction (ICD-10 codes: H49 - H52),  $52,0 \pm 0,5$  cases of pathology of the marked rubric are accounted for 1000 population (95 % confidence interval  $51,0 - 53,0 \%$ ).

According to the application materials lens diseases are on the second place,  $15,3 \pm 0,3$  cases (95% confidence interval  $14,7 - 15,9 \%$ ) of these pathologies per 1000 population.

The third place in the structure of total morbidity rate of diseases of the organs of vision belongs to conjunctival disease, per 1000 population there are  $14,1 \pm 0,2$  cases of this pathology (95% confidence interval  $13,7 - 14,5 \%$ ).

Glaucoma takes the fourth place among cases of a general incidence of diseases of the organs of vision, per 1000 population there are  $8,2 \pm 0,2$  cases (95% confidence interval  $7,8 - 8,6 \%$ ) of glaucoma. The third place in the structure of total morbidity rate of diseases of the organs of vision belongs to diseases of the eyelids (ICD-10 code: H00 – H03). The total morbidity rate of eyelid diseases is  $5,1 \pm 0,2 \%$  (95% confidence interval  $4,7 - 5,5 \%$ ) for the whole population.

Visual disturbances and blindness (ICD-10 code: H53 – H54) are on the sixth place in general structure of total morbidity rate of eye diseases. The total morbidity rate of visual disturbances and blindness among population is  $4,1 \pm 0,1\%$  (95% confidence interval

3,9 – 4,3‰). Diseases of the choroid and retina (ICD-10 codes: H30-H36) occupy the seventh place in the structure of the total morbidity rate according to application records with pathologies of the organs of vision,  $3,2 \pm 0,1$  cases of these pathologies per 1000 population (95% confidence interval 3,0 - 3,6 ‰).

Iridocyclitis and other diseases of the iris and ciliary body (ICD-10 codes: H20 – H21) are on the eighth place in the structure of the total morbidity rate of diseases of the organs of vision, the total morbidity rate of these pathologies is  $1,8 \pm 0,1$ ‰ (95% confidence interval 1,6 – 2,0‰) for whole population.

Keratitis, scars, clouding of the cornea and other diseases of the cornea (ICD-10 code: H16 – H18) are on the eighth place in the structure of the total morbidity rate of diseases of the organs of vision, the total morbidity rate of these pathologies is  $1,7 \pm 0,1$  cases per 1000 person (95% confidence interval 1,5 – 1,9‰).

Diseases of the lacrimal apparatus occupy the tenth place in the structure of the total morbidity of the population with pathologies of the organs of vision. The overall incidence rate is  $1,3 \pm 0,1$  ‰ (95% confidence interval 1,1 – 1,95 ‰) for local population.

The morbidity rate of diseases of the organs of vision has the gender specifications (the total morbidity rate among men is higher), disturbances of accommodation and refraction ( $52,0 \pm 0,5$  ‰), lens diseases ( $15,3 \pm 0,3$  ‰), conjunctiva ( $14,1 \pm 0,2$  ‰), glaucoma ( $8,2 \pm 0,2$  ‰) prevail in the structure of morbidity. The gender difference is characteristic for the morbidity rate of disturbances of accommodation and (the morbidity risk among men is higher than among women), glaucoma (the morbidity risk among men is higher), lens diseases (the morbidity risk among women is higher) and other pathologies.

Age dependent dynamics of the total morbidity rate of conjunctival diseases (y) with differentiation of 10 age groups (x) (0-4, 10-14, 15-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70 years and older) is described by the following regression equations with good approximation ( $R^2 > 0,90$ ):

For men:

$$Y = 0,0319x - 0,7473x + 6,5515x - 25,675x + 50,042 \quad (R^2 = 0,923);$$

For women:

$$Y = -0,0033x^6 + 0,1186x^5 - 1,6304x^4 + 10,633x^3 - 32,789x^2 + 38,211x + 10,229 \quad (R^2 = 0,9955)$$

The tendency line shows that the top morbidity rate of conjunctival diseases comes to early childhood period (0-4 years).

Age tendency of morbidity coefficient (y) of lens diseases is described by the following regression equations:

$$\text{For men: } Y = -0,0036x^6 + 0,0708x^5 - 0,3081x^4 - 1,1366x^3 + 10,726x^2 - 22,729x + 14,524 \quad (R^2 = 0,9865);$$

$$\text{– For women: } Y = -0,0153x^6 + 0,4184x^5 - 4,3316x^4 + 21,626x^3 - 54,456x^2 + 64,648x - 26,941 \quad (R^2 = 0,991)$$

The tendency line of the morbidity rate of lens diseases depending on age is similar among the male and female populations; the stability of the indicator at a low level up to 50 years of age is characteristic for both gender groups, the dynamics differ after 50 years.

The dynamics of the total morbidity rate of myopia among the male and female population is similar. Increasing of the morbidity rate reaches its highest level among male population at ages 10-14 years, and among female population at age 20-29 years. The main age-related (X) tendency of the morbidity rate of myopia (Y) is described by the following equations:

– For men:

$$Y = 0,0207x^6 - 0,6981x^5 + 9,215x^4 - 59,599x^3 + 191,66x^2 - 269,73x + 130,31 \quad (R^2 = 0,9981);$$

– For women:

$$Y = 0,0114x^6 - 0,3929x^5 + 5,3225x^4 - 35,544x^3 + 118,26x^2 - 169,09x + 82,191 \quad (R^2 = 0,9836)$$

The age-related dynamics of the morbidity rate of hyperopia among male and female population groups is basically similar, and is described by the corresponding poly-nominal regression equations:

$$\text{– For men: } y = 0,0331x^6 - 1,0196x^5 + 11,849x^4 - 64,594x^3 + 170,92x^2 - 219,92x + 155,08 \quad (R^2 = 0,8564);$$

$$\text{– For women: } y = 0,0476x^6 - 1,4929x^5 + 17932x^4 - 103,34x^3 + 295,94x^2 - 399,4x + 223,25 \quad (R^2 = 0,7848)$$

The age-related tendency line of the morbidity rate of hyperopia is similar among the male and female populations; the stability of the indicator is corresponding to age intervals 10-40 years.

The age-related dynamics of the morbidity rate of reversible astigmatism is chaotic. But, correcting the tendency line by the six-digit polynomial regression equation an upward trend in the incidence of astigmatism is being detected:

- For men:  $Y = -0,0062x^6 + 0,2115x^5 - 2,8382x^4 + 18,837x^3 - 63,85x^2 + 102,76x - 55,331$  ( $R^2 = 0,8864$ );
- For women:  $Y = 0,002x^6 - 0,0752x^5 + 1,0848x^4 - 7,5898x^3 + 26,338x^2 - 39,181x + 19,499$  ( $R^2 = 0,8811$ ).

The tendency line of age-related dynamics of astigmatism among male and female population groups are similar and characterized with dynamic increasing of indicators.

Patients visit doctors-ophthalmologists not regularly, indicators change within the wide intervals, the factual volume of this interval is 240,74 visits per 1000 person, mainly due to visits because of the disturbances in accommodation and refraction (93,60 per 1000 person) and glaucoma (37,72 per 1000 person).

### **Medical and social burden of glaucoma at the level of primary medical and sanitary services**

The morbidity rate of glaucoma (initial cases during the current year) in Baku city, on sample of Yasamal district is  $4,89 \pm 0,24$  incidents per 1000 person till 40 years old and older. The main risk factors for morbidity are a change in the age composition of the population, an increase in the proportion of people over 40 years of age, especially those who are older than 70 years. Initial morbidity with glaucoma at age of 80 years and older ( $19,5 \pm 2,98\%$ ) is 5 times higher exceeds that at the age of 40-49 years ( $3.61 \pm 0.34\%$ ). The worldwide tendency of demographic processes, which are outlined in Azerbaijan, is associated with an increase in the proportion of elderly people, which creates the prerequisites for the incidence of glaucoma

in Azerbaijan. Therefore, the primary health care provider should be focused on the early detection of glaucoma.

Glaucoma incidences firstly diagnosed during the doctor visit, often are diagnosed in a late, advanced stages (2,69‰ from 3,61‰ at the age of 40-59 years, 3,85‰ from 14,15‰ at the age of 80 years and older), which indicates a lack of attention to the problem of glaucoma, both by the medical workers and by population. Therefore, educational work at the community level and the active detection of glaucoma by all specialists at the outpatient level is becoming urgent and is a priority of primary health care services.

The contingent of patients with glaucoma (7,84; 17,08; 40,06; 70,85 & 30,15‰ respectively at ages of 40-49, 50-59, 60-69, 70-79, 80 years and older) and distribution of them according the pathology stage (share of patients on the I, II, III & IV stages are respectively 22,8; 46,2; 19,9 & 11,1%), the presence of several chronic pathologies in patients (3,45 chronic pathologies of internal organs, 2,2 chronic pathologies of the organs of vision) characterize the complexity of health care services, both at the primary and at an expensive inpatient level of treatment. Consequently, reducing the workload on expensive health care services is possible by redistributing resources towards the development of family medicine, which should provide medical, diagnostic and rehabilitation work at the local level. The increasing role of chronic pathology in the deterioration of the health status of the population should be taken as the most important argument for accelerating the development of family practice at the initial stage of health care.

### **The potential role of the family doctor in the medical care of ophthalmic patients**

The health care system of the Azerbaijan Republic is starting initiation of family medical care in practice of primary medical and sanitary service. The official confirmation of this tendency is the inclusion of a family doctor in the nomenclature of medical specialties.

According to the qualification characteristics a family doctor should have competencies on the examination, diagnosis, treatment and rehabilitation of patients with many pathologies, including eye

diseases. The competence of general practitioners on diagnosis and treatment of eye diseases covers inflammatory diseases (conjunctivitis, blepharitis, dacryoadenitis, dacryocystitis, keratitis, barley and others), the foreign body of the eye, glaucoma, refractive errors (myopia, hyperopia, presbyopia), strabismus, cataracts.

With the total morbidity rate of eyelid diseases  $5,1 \pm 0,2\%$ , 3,5 doctor visits comes to one patients. The initial visit is conducted by family doctor, who continues treatment after consultation with an ophthalmologist. In this relation the expected workload of family doctor is 6,25 doctor visits per 1000 persons or 1,23 visits per 1 patient with eyelid diseases. On the average family doctor decreases the workload of doctor-ophthalmologist on health care service to patients with eyelid diseases for 35,0%.

The total morbidity rate of diseases of the lacrimal apparatus among population is  $1,3 \pm 0,1\%$ . The initial application of these patients can be both to ophthalmologists and family doctors. As a result the workload volume of family doctors on primary medical aid to patients with diseases of the lacrimal apparatus is not high (0,30 visits per 1000 person).

According to expert opinions, the competence of a family doctor allows to implement 41,6% of expected workload of ophthalmologists. As a result, the doctor's workload for the provision of therapeutic and diagnostic services to patients with conjunctival diseases is 11,15 visits per 1000 person.

Keratitis is relatively less prevailed among population and is  $1,7 \pm 0,1$  incidences per 1000 person, which requires 7,14 visits for diagnostics and treatment. In correspondence with his professional competencies the family doctor provides initial visits. Therefore, 1.70 visits to a family doctor per 1,000 person, are in connection with this disease, which is mainly treated by an ophthalmologist. However, a family doctor can reduce the workload of an ophthalmologist in connection with this pathology for 23.8%.

Lens diseases are relatively widespread among the population ( $15,3 \pm 0,3$  incidences per 1000 person). On an outpatient basis, these patients need the supervision of doctors, and medical care is provided in a hospital setting. Therefore, 1.4 outpatient visits comes to per a



patient. Totally 21,42 doctor visits per 1000 person is recommended. Totally 21,42 visits per 1000 person should be to ambulatory doctors, 5,3 of which can be performed by family doctors and 16,12 – ophthalmologist.

Glaucoma is also a widespread disease; there are  $8.2 \pm 0.2$  cases of this pathology per 1000 person. For treatment and observation of these patients, on average, 4.6 visits to outpatient doctors are necessary for one patient. According to expert estimations 29,52 visits to ophthalmologist per 1000 person should be planned, 8.20 visits per 1000 person - to family doctor.

Diseases of the choroid and retina, compared with glaucoma and lens diseases, are less common ( $3.2 \pm 0.1$  cases per 1000 person). Averagely of 2.5 visits per patient is implemented on an outpatient basis. Totally 8 outpatient visits per 1000 person should be planned in connection with the treatment and diagnostic needs of patients, 6.80 visits of which should be planned to ophthalmologist, 1.20 visits to family doctor.

Disorders of accommodation and refraction are widespread among the population -  $52,0 \pm 0,5$  pathologies per 1000 person. The total number of diagnostic visits for these patients per 1000 person is 93,60 (1,8 visits for a patient). Family doctor competency (optical vision correction with test eyeglass lenses) allows him to take on a certain part of the medical diagnostic work. According to expert's assessments family doctors can provide 40,6% of total volume of treatment and diagnostic care to patients with disorders of accommodation and refraction. 38,0 visits per 1000 person are recommended for implementation of the mentioned functions.

The total workload of the family doctor on primary health care for patients with eye diseases is 79.40 visits per 1000 population. This will allow to reduce the existing workload of the ophthalmologist for 33.0%. Consequently, the initiation of the post of family doctor may be associated with a reduction in the workload of ophthalmologists.

For approving the effectiveness of the active detection of glaucoma by a family doctor, we planned a special observation, which we

conducted prospectively, covering a representative number of patients.

All patients before the visit to a doctor-specialist were covered by tonometry of the eyes and examined by an ophthalmologist (regardless of the absence and availability of indications) were covered by tonometry of the eyes and examined by a doctor by an ophthalmologist (regardless of the absence and availability of indications) in a planned manner as they visit a doctor in main specialty (general practitioners, neuropathologists, dentists and others). Based on the results of tonometry and examination by an ophthalmologist, patients with suspected glaucoma, underwent an in-depth examination at the Ophthalmological Center named after academician Z. Aliyeva.

Intraocular pressure greater than 21 mmHg is detected at 10,5% of patients of polyclinics older than 39 years ( $12,8 \pm 1,6\%$  - men,  $8,6 \pm 1,2\%$  - women; at ages 40-49 years old –  $2,7 \pm 0,8\%$ ; 50-59 years old –  $10,6 \pm 1,7\%$ ; 60 years and older –  $25,8 \pm 2,9\%$ ).

Intraocular pressure greater than 21 mmHg as a criteria of early detected glaucoma, is characterized by high sensibility (86,75), specificity (99,85), predictive value (97,8%).

For early detection of glaucoma it is necessary to measure intraocular pressure in all outpatient clinics of the country of all patients older than 39 years at first visit. This mission can entrusted to family doctors.

The competency of family doctors on ophthalmology allows to detect myopia ( $4,6 \pm 0,7\%$ ), hyperopia ( $3,8 \pm 0,6\%$ ), astigmatism ( $2,2 \pm 0,5\%$ ), cataracts ( $1,4 \pm 0,4\%$ ), glaucoma ( $2,3 \pm 0,5\%$ ), diabetic retinopathy ( $0,1 \pm 0,1\%$ ) and other eye diseases ( $4,4 \pm 0,7\%$ ).

Using of professional competence of family doctors in the field of ophthalmology enables initially detect  $18,8 \pm 1,2\%$  of eye diseases among population at age 40 years and older, including  $4,6 \pm 0,7$  cases of myopia,  $3,8 \pm 0,6$  cases of hyperopia,  $2,2 \pm 0,5$  cases of astigmatism,  $1,4 \pm 0,4$  cases of cataracts,  $2,3 \pm 0,5$  cases of glaucoma,  $0,1 \pm 0,1$  cases of diabetic retinopathy,  $4,4 \pm 0,7$  cases of other pathologies.

The participation of the family doctor in the active detection of glaucoma by regular tonometry will reduce the late detection of dis-

ease among patients in the third stage of glaucoma by more than 2 times, as well as completely eliminate cases of late detection of pathology in the fourth stage.

### **Conclusion**

1. On the primary medical and sanitary level the morbidity rate of eye diseases among population is  $109,1 \pm 0,9$  cases per 1000 person ( $114,3 \pm 1,0\%$  among men and  $104,3 \pm 0,9\%$  among women), the leading places among which is occupied by eye muscle diseases, disorders of friendly eye movement, accommodation and refraction ( $52.0 \pm 0.5 \%$ ), lens diseases ( $15.3 \pm 0.3 \%$ ), conjunctiva ( $14.1 \pm 0.2 \%$ ), glaucoma ( $8.2 \pm 0.2 \%$ ) and diseases of the eyelids ( $5.1 \pm 0.2 \%$ ).
2. The morbidity rate of pathologies of organ of vision depends on age and gender. Increasing of age-related morbidity risk is characteristic for myopia (10-49 years old), hyperopia (0-9 years old, 40 years old and older), lens diseases (50 years old and older), glaucoma (50 years old and older). Gender differences is characteristic for patients with pathology of accommodation and refraction (the risk is greater among men), glaucoma (the risk is greater among men), lens diseases (the risk is greater among women).
3. Multiple differences between the level of primary ( $4,89 \pm 0,24\%$ ) and general ( $22,52 \pm 0,51\%$ ) morbidity, multiple-morbidity (5.46 chronic pathologies per patient), comorbidity (2,2 5. chronic pathologies per patient), also a high probability of disability ( $23,7 \pm 1,7\%$  of patients) is characteristic for glaucoma cases due to the late detection of pathology – at II, III and IV stages (78,4% of patients). A reliable way to prevent disability due to glaucoma is the timely detection of it in the early stages. Active and regular tonometric examination of patients aged 40 years and older reveals glaucoma in  $2.8 \pm 0.8\%$  of men and  $1.9 \pm 0.6\%$  of women.
4. For studying needs of population on ophthalmological outpatient care an important criteria is volume of visits and substantiation of standards for the distribution of visits between

family doctors and ophthalmologists. According to our data, the volume of visits in connection with ophthalmopathy among the examined population is 140.74 per 1000 person, family doctor who has competency on ophthalmology can provide 79.4 visits per 1000 person, including 6,25 cases of glaucoma, 38,0 cases of disturbances of accommodation and refraction.

5. A family doctor, using professional knowledge and skills, can carry out a significant part of diagnostic and therapeutic measures when servicing patients with ophthalmopathy. In particular, when examining patients aged 40 and older, a family doctor can initially identify  $18.8 \pm 1.2$  eye diseases, including  $4.6 \pm 0.7$  cases of myopia,  $3.8 \pm 0.6$  cases of astigmatism,  $2,3 \pm 0.5$  cases of glaucoma,  $1,4 \pm 0.4$  cases of cataracts,  $4,4 \pm 0.7$  cases of other pathologies.

### **Practical recommendations**

1. For solution of tasks on development of family medical care practice in Azerbaijan it is important to create an effective system (program) of undergraduate and postgraduate training for family doctors, focused on the formation of their professional competencies in a variety of diseases, including ophthalmopathy.
2. When initiating the posts of family doctors, training in their ophthalmological competencies not less than 30 training hours, which should allow them to provide diagnostic and treatment assistance for inflammatory eye diseases (conjunctivitis, blepharitis, dacryoadenitis, dacryocystitis, keratitis, barley), strabismus, cataracts and glaucoma is necessary.
3. For early detection of glaucoma and preventing the disability due to this disease by outpatient and family doctor, it is important actively conduct a tonometric study during initial visits and preventive examinations of persons aged 40 years and older.
4. Initiating the posts of family doctors and providing them with the competence of primary health care in ophthalmology can

reduce the need for ophthalmologist in polyclinics by 30%, which should be intended while planning staff regulations.

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