



GENERAL AND LOCAL RISK FACTORS OF GLAUCOMA IN THE ELDERLY POPULATION, REGIONAL SPECIFIC ASPECTS OF THE CLINICAL COURSE (RESULTS OF A REPROSPECTIVE EPIDEMIOLOGICAL STUDY IN ANDIJAN)

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In the Andijan region of the Fergana Valley, a special study on glaucoma involving the elderly population has not been carried out. If a conclusion is made based on statistical data, there is a need to monitor glaucomatous processes in this contingent - population, as it happens in the world, and to study the risk factors, as well as the modern regional/regional aspects, changes, scientific, epidemiologic - clinical descriptions of its clinical course. The main reason is that epidemiologic and clinical details about glaucoma are not available in the elderly population at all, or the results of a small number of investigations are completely out of date [3,4,7,14]. Based on this, we dedicated a part of our research to study the mentioned and unsolved issues in the gerontological age population by organizing a 4-year clinical-epidemiological monitoring in the conditions of Andijan. We describe the obtained results below.

DOI Number: 10.14704/nq.2022.20.11.NQ66248

NeuroQuantology 2022; 20(11): 2486-2497

Characteristics of the origin and prevalence of glaucoma in the elderly population in relation to general and local risk factors

Epidemiological features of glaucoma were studied and evaluated in elderly population of Andijan ethnic urban and rural population. Table 1 and Figure 1 present the characteristics of the formation and distribution of various forms of glaucoma in the urban elderly population.

It is evident from the data that OBG is established by the prevalence of 20.2 and 19.0 percent in the urban age population and in the

total population, respectively [RR= 1.07; II=(0.60 – 1.89); $\chi^2=0.05$; R=0.83].

Other types of glaucoma under the influence of the "city factor" are determined by the following distribution frequencies in the urban age population and in the general population: YoBG - 46.4 and 48.6 percent [RR= 2.45; II=(1.52 – 3.95); $\chi^2=19.37$; R<0.05]; mixed glaucoma - from 7.1 and 6.3 percent [RR= 0.38; II=(0.16 – 0.89); $\chi^2=4.39$; R<0.05]; terminal glaucoma – from 10.7 and 17.2 percent [RR= 0.56; II=(0.27 – 1.16); $\chi^2=2.10$; R=0.15]; glaucoma attack - from 15.5 and 91.1 percent [RR= 0.82; II=(0.43 – 1.53); $\chi^2=0.37$; R=0.54].

Prevalence of various forms of glaucoma in the elderly population depending on the "urban factor"

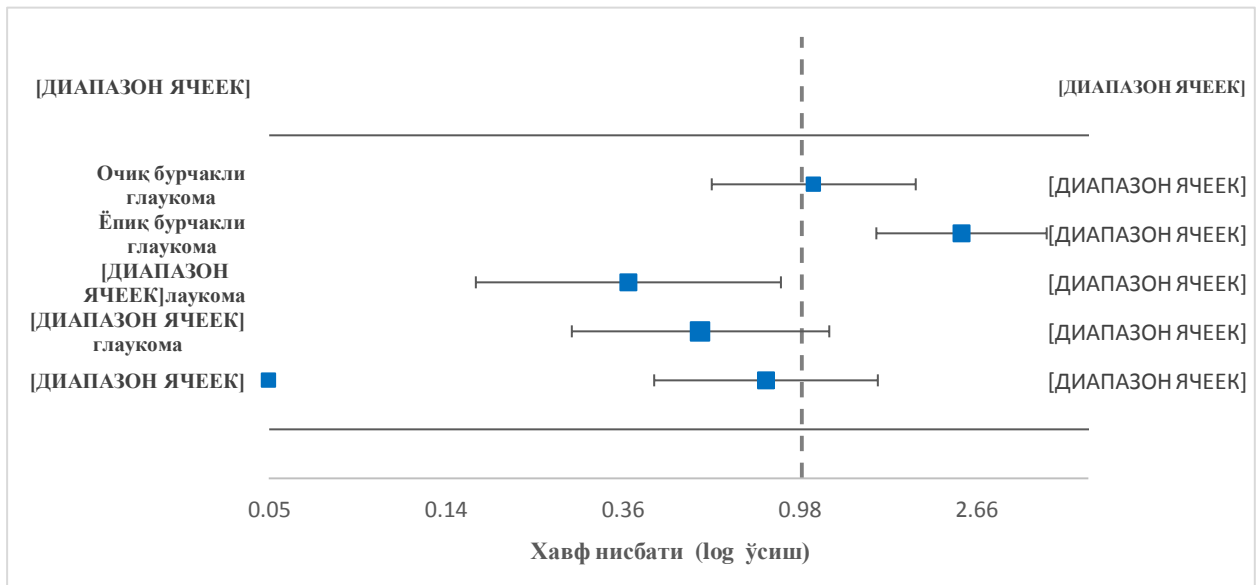
1- table

Forms of glaucoma	Older urban population			General elderly population			RR	ИИ		χ^2	p
	N	Total glaucoma		N	Total glaucoma			max (ю↑)	min (к↓)		
		n	percentage		n	percentage					
Open-angle glaucoma	84	17	20,2	553	105	19,0	1,07	0,60	1,89	0,05	0,83



Angle-closure glaucoma	84	39	46,4	553	269	48,6	2,45	1,52	3,95	19,37	<0.05
Mixed glaucoma	84	6	7,1	553	35	6,3	0,38	0,16	0,89	4,39	<0.05
Terminal glaucoma	84	9	10,7	553	95	17,2	0,56	0,27	1,16	2,10	0,15
Acute attack	84	13	15,5	553	504	91,1	0,82	0,43	1,53	0,37	0,54

the "rural factor" will be described in the elderly



1 – picture. Features of the origin of glaucoma in the elderly population under the influence of the "city factor" in the conditions of Andijan

When the "urban factor" is analyzed as a risk factor for the formation of various forms of glaucoma, this factor is clinically (RR=2.45) and statistically II= (15.2 - 3.95) in the development of YoBG; $\chi^2=19.37$; $R<0.05$) was found to be significant.

In open, terminal glaucoma and acute attack of glaucoma, the "city factor" is clinically (RR=1.07; 0.56; 0.82) and statistically [II= 0.6 - 1.89; 0.27 – 1.16; 0.43 – 1.53; $\chi^2= 0.05$; 2.1; 0.37; $R=0.83$; 0.15; 0.54] was found not to be significant.

It was confirmed that the "urban factor" has a protective effect in the development of mixed glaucoma (RR=0.38), and Fisher's R value showed these results to be statistically significant [II= (0.16 – 0.89); $\chi^2=4.39$; $R<0.05$]. In the next analysis, the development and prevalence of glaucoma under the influence of

population of Andijan (Table 2 and Figure 2).

It became clear that in the elderly population living in rural conditions (that is, under the influence of the "rural factor"), various forms of glaucoma are determined by aspects that are relatively specific to the general population. In particular, forms of glaucoma under the influence of the "rural factor" are observed in the rural population and in the general population with the following distribution frequency: open-angle glaucoma - from 18.8 and 19.0 percent [RR= 0.99; II=(0.72 – 1.35); $\chi^2=0.01$; $R=0.94$]; angle-closure glaucoma – from 49.0 and 48.6 percent [RR= 2.58; II=(1.95 – 3.41); $\chi^2=64.20$; $R<0.05$]; mixed glaucoma - from 6.2 and 6.3 percent [RR= 0.33; II=(0.21 – 0.50); $\chi^2=22.54$; $R<0.05$]; terminal glaucoma - 18.3 and 17.2 percent [RR= 0.97; II=(0.70 – 1.32); $\chi^2=0.04$; $R=0.83$]; glaucoma attack - from 7.7 and 91.1 percent [RR= 0.40; II=(0.27 – 0.60); $\chi^2=16.85$; $R<0.05$].

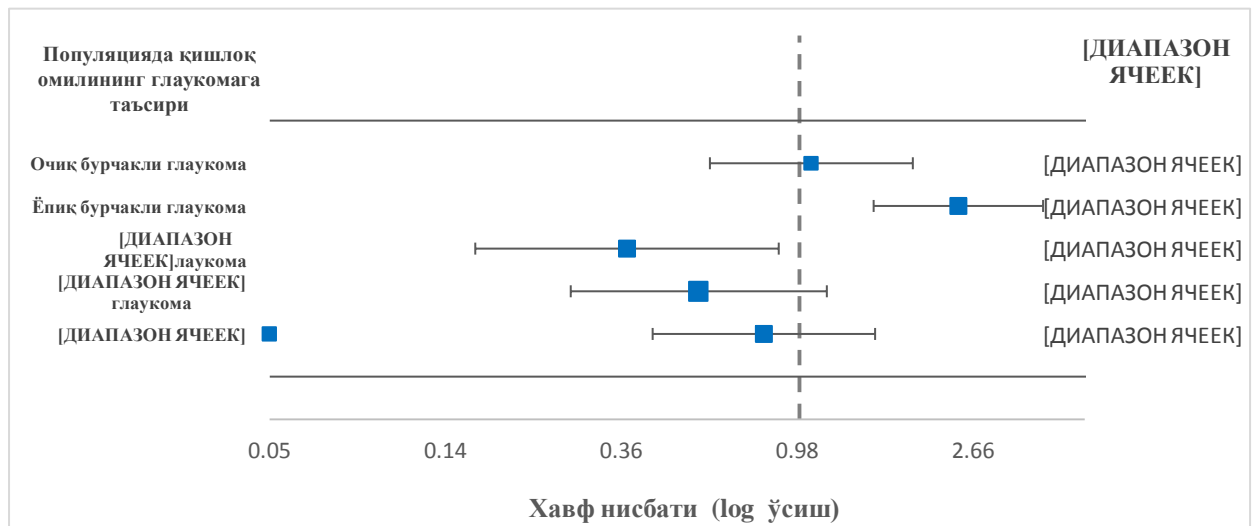


2 – table

Prevalence of various forms of glaucoma in the elderly population depending on the "rural factor"

Types of glaucoma	elderly rural population			General elderly population			RR	ИИ		Хи2	p
	N	Total glaucoma		N	Total glaucoma			max (ю↑)	min (к↓)		
		n	Percentage		n	Percentage					
Open-angle glaucoma	469	88	18,8	553	105	19,0	0,99	0,72	1,35	0,01	0,94
Angle-closure glaucoma	469	230	49,0	553	269	48,6	2,58	1,95	3,41	64,20	<0.05
Mixed glaucoma	469	29	6,2	553	35	6,3	0,33	0,21	0,50	22,54	<0.05
Terminal glaucoma	469	86	18,3%	553	95	17,2	0,97	0,70	1,32	0,04	0,83
Acute attack	469	36	7,7	553	504	91,1	0,40	0,27	0,60	16,85	<0.05

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2 – picture. Features of the origin of glaucoma in the elderly population under the influence of the "village factor" in the conditions of Andijan

OBG, terminal glaucoma and glaucoma attacks are established with a low frequency compared to the urban population with an insignificant difference ($R > 0.05$). Compared to the urban population, the elderly population of the village

has high frequency of glaucoma ($R > 0.05$) and terminal glaucoma ($R < 0.05$).

The analysis shows that the "rural factor" has a clinical ($RR = 2.58$) and statistical ($II = 1.95 - 3.41$; $\chi^2 = 64.2$; $R < 0.05$) significance in the development of BG. "Rural factor" in open and terminal glaucoma is clinically ($RR = 0.99$; 0.97) and statistically ($II = 0.72 - 1.35$; $0.7 - 1.32$; $\chi^2 = 0.01$; 0.04 ; $R = 0.94$; 0.83) was not significant. In addition, it is determined that the "rural factor"



has a protective effect in the development of mixed glaucoma and an acute attack of glaucoma [RR=0.33; 0.4] and Fisher's R value confirms that these results are statistically

reliable [II=0.21 – 0.5; 0.27 – 0.6; $\chi^2= 22.54$; 16.85; $R<0.05$; 0.05].

Age was analyzed as a risk factor for glaucoma in the elderly population (presented in Table 3, Table 4, Figure 3 and Figure 4).

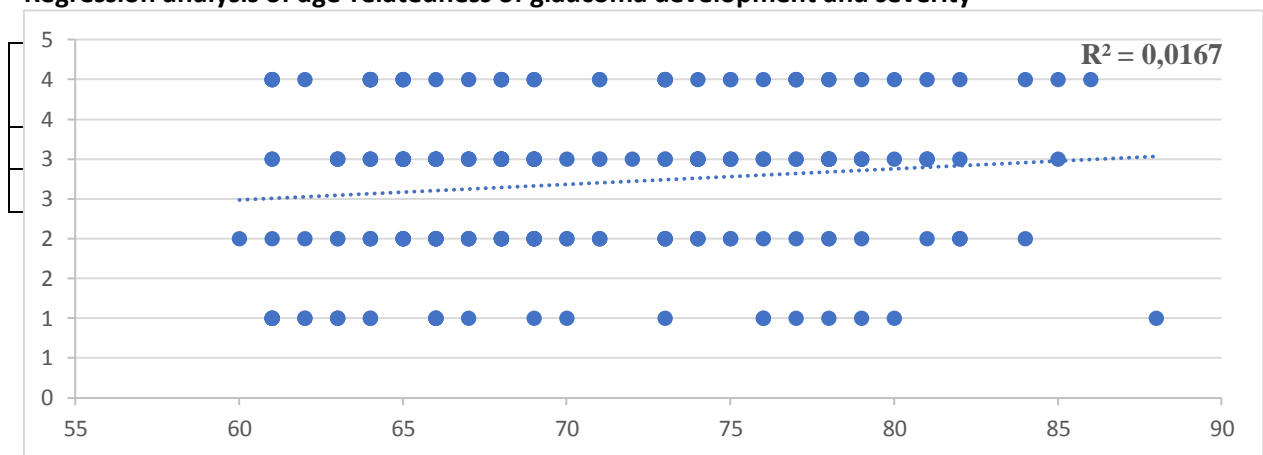
3 – table

Age-related changes in visual acuity in the gerontological age population

No	Inspection objects	Coefficient R2	P
1.	OD	-0,0036	0,34
2.	OS	-0,0155	0,06

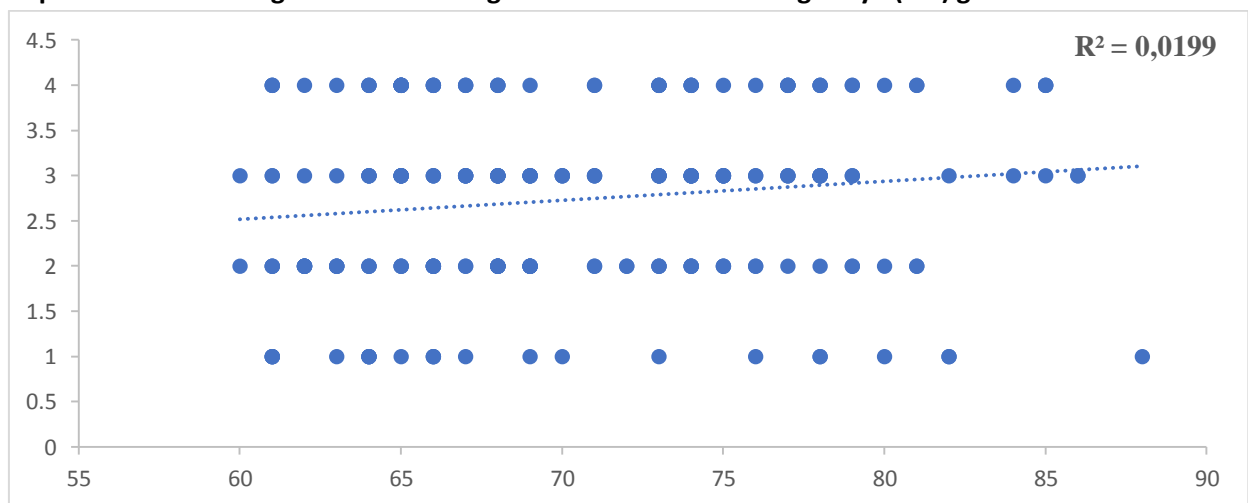
4 - table

Regression analysis of age-relatedness of glaucoma development and severity



From the numerical data presented in the tables and figures, it can be seen that the age factor is a significant risk for the development of glaucoma in the elderly and the elderly, as well as in the geront population. is not confirmed as a factor.

3- picture. Gerontological features of age-related formation of right eye (OD) glaucoma



4 – picture. Gerontological features of age-related formation of glaucoma of the left eye (OS).



In the population of gerontological age, the change of age and the increase in the level of glaucoma of both eyes (OD, OS) were analyzed by linear regression, and it was found that there is no correlation between numerical indicators [R²=0.0167; 0.0199; R=0.06; 0.02].

Age-related changes in visual impairment, which develops and worsens in connection with glaucomatous processes, were also studied in regression analysis.

The numerical statement of the mathematical analysis of the obtained results is presented in Table 3 and Figures 5 and 6 attached to the appendix.

It is evident from them that with increasing age, in the elderly population, the increase in the level of OD and OS visual acuity, when analyzed in linear regression, it was found that there is no relationship between the numerical indicators [R² =0.0036; - 0.0155; R = 0.34; 0.06].

It was confirmed that with increasing age, the increase in the level of intraocular pressure (OD, OS) was analyzed by linear regression, and it was found that there is no relationship between numerical indicators [R²=0.0018; - 0.0001; R = 0.48; 0.83].

The association of arterial pressure with glaucoma was studied in a special linear regression analysis. It should be noted that such a prospective epidemiological study was carried out in the geront population, which motivated us to prepare the profaol preventive base scientific field for geronto-geriatric ophthalmology (in the case of glaucoma).

The analysis confirmed that there was no relationship between the increase in systolic arterial pressure and the increase in OD and OS glaucoma, according to numerical values [R² =0.0218; - 0.0016; R = 0.8; 0.65].

Similarly, there is no correlation between the increase in systolic arterial pressure (SBP) and the increase in visual acuity [R² =0.055; - 0.00005; R = 0.4; 0.4].

Changes in diastolic arterial pressure in the elderly population were also studied in relation

to the degree of glaucoma and visual acuity, and no "organic increase" was observed. Therefore, it is logical to say that there are reasons to confirm that diastolic AB is not a synogenic, but a pathogenic risk factor for glaucoma. Our study confirms the conclusions obtained in clinical studies [5,6,11].

In conclusion, it was found that there was no relationship between the increasing DAB and the increasing degree of OD and OS glaucoma when analyzed in linear regression [R² =0.0143; 2E - 07; R = 0.11; 0.98].

Regarding the relationship between pulse pressure and the degree of glaucoma [R² =0.0018; 0.0095; R = 0.56; 0.176] and again, the increase in visual acuity in the geront population with increasing pulse pressure is confirmed by linear regression analysis, and there is no correlation between numerical indicators [R² =0.0001; 0.0002; R = 0.87; 0.81].

As a general conclusion of the chapter, it can be observed that in the valley conditions, the population of gerontological age has specific epidemiological characteristics of glaucoma, and they serve as a scientific foundation for treatment and prevention programs.

Regional characteristics of the clinical course of glaucoma in the elderly population (results of 4-year epidemiological monitoring in the conditions of Andijan)

Glaucoma is one of the rapidly growing diseases [1,8,15], and secondly, according to the evident results of modern studies, it is diagnosed late [12,13] and often - with the priority of non-traditional clinical symptoms [2,9,10]. It is known from the sources that these characteristics of the elderly population, especially in the territory of Uzbekistan, have not been fully studied, and the need to develop such meaningful research has arisen.

It became clear that a characteristic aspect for the elderly population is that glaucoma occurs in them in most cases based on comorbidity (Table 5 and Figure 5).

5 – table

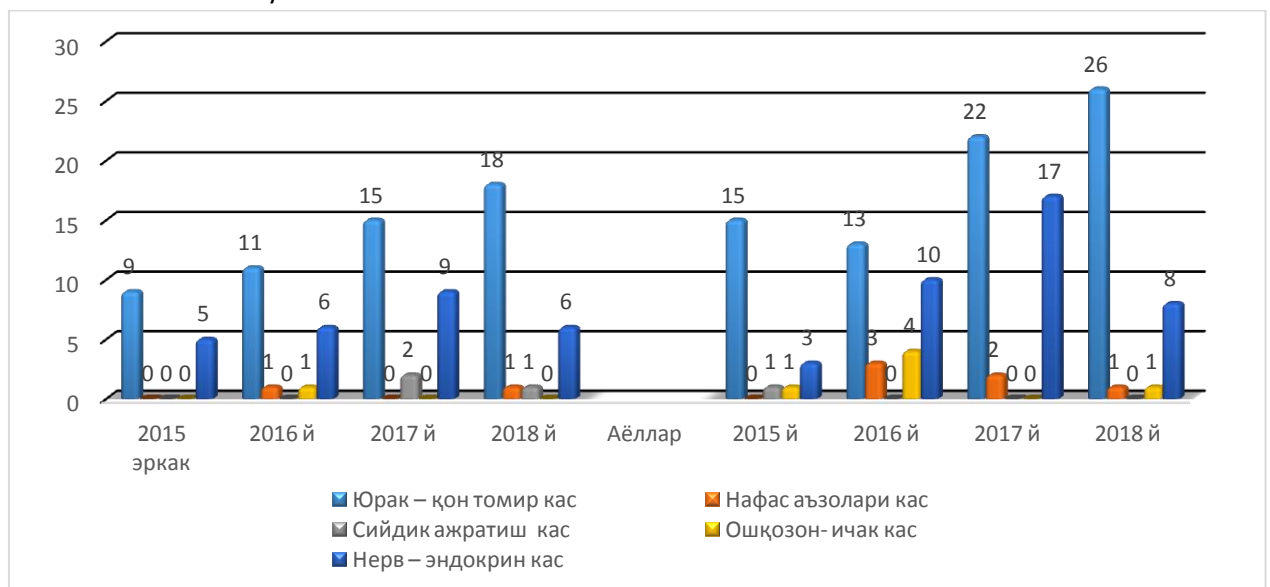


Prevalence of glaucomatous comorbidity and 4-year changes in the elderly population

Comorbid diseases	Total glaucoma (n= 266)								Total population			
	Эркаклар (n= 113)				Аёллар (n=153)							
	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018
I	$\frac{9}{3,38}$	$\frac{11}{4,14}$	$\frac{15}{5,65}$	$\frac{18}{6,77}$	$\frac{15}{5,64}$	$\frac{13}{4,89}$	$\frac{22}{8,27}$	$\frac{26}{9,77}$	$\frac{24}{4,3}$	$\frac{24}{4,13}$	$\frac{37}{6,96}$	$\frac{44}{8,27}$
II	$\frac{0}{0,00}$	$\frac{1}{0,38}$	$\frac{0}{0,00}$	$\frac{1}{0,38}$	$\frac{0}{0,00}$	$\frac{3}{1,13}$	$\frac{2}{0,75}$	$\frac{1}{0,38}$	$\frac{0}{0,0}$	$\frac{4}{2,50}$	$\frac{2}{0,74}$	$\frac{2}{0,74}$
III	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{2}{0,75}$	$\frac{1}{0,38}$	$\frac{1}{0,38}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{1}{0,36}$	$\frac{0}{0,0}$	$\frac{2}{0,74}$	$\frac{1}{0,36}$
IV	$\frac{0}{0,00}$	$\frac{1}{0,38}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{1}{0,38}$	$\frac{4}{1,50}$	$\frac{0}{0,00}$	$\frac{1}{0,38}$	$\frac{1}{0,36}$	$\frac{5}{1,88}$	$\frac{0}{0,0}$	$\frac{1}{0,36}$
V	$\frac{5}{1,88}$	$\frac{6}{2,26}$	$\frac{9}{3,38}$	$\frac{6}{2,26}$	$\frac{3}{1,13}$	$\frac{10}{3,76}$	$\frac{17}{6,39}$	$\frac{8}{3,01}$	$\frac{8}{3,01}$	$\frac{16}{6,702}$	$\frac{26}{9,77}$	$\frac{14}{5,27}$

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Note: In rate - in absolute number, in denominator - in percentage; I - cardio comorbidity, II - pulmonary comorbidity, III - nephrological comorbidity, IV - gastroenterological comorbidity, V - neuro endocrine comorbidity



5 – picture. Gerontological aspects of comorbidity with glaucoma

Note: here and in the future: KKOM - glaucoma combined with cardiovascular diseases, PKOM - glaucoma combined with lung - bronchial diseases, NZCOM - glaucoma combined with diseases of the urinary system, NECOM - neuroendocrine comorbidity.

According to the analytical results, it is known that the highest frequency of comorbidity with glaucoma is cardiovascular diseases (CVD), and its frequency has more than doubled during the 4-year follow-up ($R < 0.01$).

Neuro-endocrine diseases are included as comorbidities with glaucoma, that is, the frequency of NECOM spread has increased by 1.7 times ($R < 0.05$). A similar epidemiological

increase is confirmed in PKOM ($R < 0.01$) and NEKOM ($R < 0.05$), but no significant change was observed in GEKOM.

In particular, KKOM is determined by the prevalence of 4.13 percent in 2015, 4.13 percent in 2016, 6.96 percent in 2017, and 8.27 percent in 2018. In the observation years, PKOM is observed from 0.0 percent, 2.50 percent, 0.79 percent and 0.74 percent, respectively. The frequency of NEKOM is 0.36 percent, 0.0 percent, 0.74 percent and 0.36 percent in the inspection years.

GEKOM is based on relatively low prevalence levels of 0.36 percent, 1.88 percent, 0.0



percent, and 0.36 percent in the examined population ($R < 0.05$).

NEKOM attracts attention with a high frequency of distribution and, in particular, in 2015 - 3.01 percent, in 2016 - 6.02 percent, in 2017 - 9.77 percent and in 2018 - 5.27 percent in levels and is confirmed by a significant increase ($R < 0.05$).

Cardiocomorbidity predominates in the female population with insignificant differences and is noted in the years of examination in men and women with agreement (table 4.2.1) as follows: in 2015 - 3.38 and 4.89 percent ($R > 0.05$), in 2016 - 4,14 and 4.89 percent ($R > 0.05$), in 2017 - from 5.64 and 8.27 percent ($R > 0.05$), in 2018 - from 6.77 and 9.77 percent ($R > 0, 05$).

The frequency of detection of pulmonological pathologies combined with glaucoma was confirmed in men and women at relatively low rates: in 2015 - 0.00 and 0.00 percent, in 2016 - from 0.38 and 1.13 percent ($R < 0.05$), in 2017 - 0, 00 and from 0.75 percent ($R < 0.05$), in 2018 - from 0.38 and 0.38 percent ($R < 0.05$)

It is found that diseases of the urinary system are rarely recorded as a diagnosis

accompanying glaucoma in the elderly population and are determined as follows in men and women: 0.00 and 0.38 percent in 2015, 0.00 and 0.00 percent in 2016, 0.00 and 0.00 percent in 2017, 75 and 0.00 percent, in 2018 - 0.38 and 0.00 percent ($R < 0.05$).

The frequency of detection of gastroenterocomorbidity with glaucoma is confirmed in relatively small percentages in elderly men and women: 0.00 and 0.38% in 2015, 0.38 and 1.50% in 2016, 0.00 and 0.00% in 2018. year - from 0.00 and 0.38 percent.

It is noteworthy that neuro-endocrine comorbidity is significantly associated with glaucoma. In particular, during the 4-year monitoring, this trend is maintained and recorded with the following prevalence rates in men and women: 1.88 and 1.13 percent in 2015, 2.26 and 3.76 percent in 2016, and 2.26 and 3.76 percent in 2017. From 3.38 and 6.39 percent, in 2018 - from 2.26 and 3.01 percent ($R < 0.01$).

Table 6 presents epidemiologic characteristics and 4-year changes of comorbidity in OBG in the elderly population of Andijan.

6 – table

Epidemiological description of comorbidity in open-angle glaucoma and 4-year changes in the population of Andijan of geront age

Types of comorbidity	Total glaucoma (n= 266)								RR	ИИ		Хи ²	p
	Men (n=113)				Women (n=153)					ю ↑	к ↓		
	2015	2016	2017	2018	2015	2016	2017	2018					
I	$\frac{1}{0,38}$	$\frac{2}{0,75}$	$\frac{4}{1,50}$	$\frac{4}{1,50}$	$\frac{4}{1,50}$	$\frac{6}{2,26}$	$\frac{6}{2,26}$	$\frac{10}{3,7}$	1,7 4	0.9 1	3,31	15.2 3	<0.0 5
II	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{1}{0,38}$	$\frac{0}{0,00}$	0.7 1	0.0 9	5,93	0.10	>0.0 5
III	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{1}{0,38}$	$\frac{1}{0,38}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	4,9 8	0.6 9	36.1 8	3,22	>0.0 5
IV	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{1}{0,38}$	$\frac{1}{0,38}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	1,9 9	0.3 8	10,5 5	0.72	>0.0 5
V	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{3}{1,13}$	$\frac{2}{0,75}$	$\frac{3}{1,13}$	$\frac{0}{0,00}$	$\frac{3}{1,13}$	1.0 0	0.4 8	2,07	0.00	>0.0 5

Note: rate - absolute number, denominator - percentage; I – KKOM, II – PKOM, III – NKOM, IV – GEKOM, V – NEKOM.



From the presented numerical data, it can be seen that open-angle glaucoma exhibits specific aspects of age-related comorbidity in the elderly population. In particular, comorbidity with open-angle glaucoma occurs in men and women with the following distribution frequency and is expressed differently: in 2015 - from 0.38 and 1.50 percent, in 2016 - from 0.75 and 1.50 percent, in 2017 - from 1.50 and from 2.26 percent, in 2018 - from 1.50 and 3.7 percent [RR= 1.74; II= (0.91 – 3.31); Xi2= 15.23; R<0.005]. Pulmonary comorbidity is the least common and occurs only in geront women with open-angle glaucoma with a prevalence of 0.38 percent [RR= 0.71; II= (0.09 – 5.93); Xi2= 0.10; R>0.005]. Nephrological comorbidity is also observed in OBG with a low prevalence (0.38 and 0.38 percent in men and women) [RR= 4.98; II= (0.69 – 36.18); Xi2= 3.22; R>0.005]. Such epidemiological details and changes in OBG are also noted in gastroenterological comorbidity [RR= 1.99; II= (0.3 – 10.55); Xi2= 0.72; R>0.005]. Neuroendocrine comorbidity also affects the formation of comorbidity in OBG, but this relationship is not significant in geront men and women and is observed with the following frequencies: in 2015 - from 0.00 and 0.75 percent, in

2016 - from 0.00 and 1.13 percent. , in 2017 - from 0.00 and 0.00 percent, in 2018 - from 1.13 and 1.13 percent [RR= 1.00; II= (0.480 – 2.07); Xi2= 0.00; R>0.005]. In general, it can be concluded that the effect of the comorbidity factor in the development of OBG was studied in the population, and it was confirmed that urinary system and gastrointestinal diseases have clinical significance [RR= 4.98; 1.99]. However, the confidence interval and Fisher's R value show that these results are not statistically significant: II= (0.91 – 3.31; 0.69 – 36.18; 0.38 – 10.55); Xi2= 15.23; 3.22; 0.72; R=>0.05; >0.05. Cardiovascular diseases are confirmed to have clinical significance in OBG origin [RR=1.74] and statistically significant in Fisher's R value (R<0.05). But since II crosses 1, it is possible to assess that the statistical significance of KKOM has lost its power. It was proved that the factor of neuro-endocrine diseases has no statistical and clinical significance in the development of OBG [RR= 1; II= 0.480 – 2.07; Xi2= 0.00002; R=>0.005].

Table 7 presents an epidemiological description of comorbidity in angle-closure glaucoma and 4-year changes in the geront population.

7– table

Epidemiological description of comorbidity in angle-closure glaucoma and changes in the geront population

Types of comorbidity	Total glaucoma (n=266)									Mc Nimir's one-factor analysis			
	Men (n=113)				Men (n=153)				RR	CI		Xi ²	P
	2015	2016	2017	2018	2015	2016	2017	2018		ю	к		
I	$\frac{9}{3,38}$	$\frac{9}{3,38}$	$\frac{10}{3,73}$	$\frac{12}{4,51}$	$\frac{19}{7,14}$	$\frac{3}{1,13}$	$\frac{11}{4,14}$	$\frac{12}{4,51}$	2,46	1,53	3,97	41,92	<0,005
II	$\frac{0}{0,00}$	$\frac{1}{0,38}$	$\frac{0}{0,00}$	$\frac{1}{0,38}$	$\frac{0}{0,00}$	$\frac{3}{1,13}$	$\frac{1}{0,38}$	1	35,17	4,23	292,55	29,79	<0,005
III	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{1}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	1,69	0,17	16,58	0,21	>0,005
IV	$\frac{0}{0,00}$	$\frac{1}{0,38}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{2}{0,75}$	$\frac{0}{0,00}$	$\frac{1}{0,38}$	6,76	1,47	31,13	8,60	<0,005
V	$\frac{5}{1,88}$	$\frac{5}{1,88}$	$\frac{8}{3,05}$	$\frac{1}{0,38}$	$\frac{1}{0,38}$	$\frac{7}{2,63}$	$\frac{14}{5,26}$	$\frac{4}{1,50}$	12,69	5,24	30,73	177,61	<0,005



Note: rate - absolute number, denominator - percentage; I – KKOM, II – PKOM, III – NKOM, IV – GEKOM, V – NEKOM.

The influence of the comorbidity factor in the development of closed-angle glaucoma was studied in the gerontological age population, and it was found that cardiovascular diseases, respiratory organs, urinary, stomach-intestinal and neuroendocrine diseases have clinical significance [RR=2.46; 35.17; 1.69; 6.76; 12.69]. But the fact that the urinary system crossed II 1 and Fisher's R value made us conclude that these

results are not statistically significant [II=0.17 – 16.58; Xi2=0.21; R>0.005].

Other types of comorbidity have a strong influence on the development of CKD, and this association has significant statistical significance [II=1.53 – 3.97; 4.23 – 292.55; 1.47 – 31.13; 5.24 – 30.73); Xi2=41.92; 29.79; 8.6; 177.6; R <0.005, <0.005, <0.005, <0.005].

In the development of mixed glaucoma, it is observed that the influence of comorbidity is also present (table 8). Only a significant association was found in cardio- and nephrocomorbidity [RR= 1.61; 1.69; Xi2=6.76; R <0.05].

8- table

Epidemiological description of comorbidity in mixed glaucoma and 4-year changes in the gerontological age population

Types of comorbidity	Total glaucoma (n=266)									Mc Nimar's one-factor analysis			
	Men (n=113)				Men (n=153)				RR	ИО		Chi ²	P
	2015	2016	2017	2018	2015	2016	2017	2018		ю	к		
I	$\frac{3}{1,1}$	$\frac{1}{0,4}$	$\frac{1}{0,4}$	$\frac{2}{0,8}$	$\frac{1}{0,4}$	$\frac{1}{0,4}$	$\frac{5}{1,9}$	$\frac{4}{1,5}$	2,4 6	1,6 1	0,65	3,9 9	<0,00 5
II	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	0,0 0			1,5 9	>0,00 5
III	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{1}{0,4}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	1,6 9	0,1 7	16,5 8	0,2 1	>0,00 5
IV	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	0,8 6	0,1 0	7,25	0,0 2	>0,00 5
V	$\frac{0}{0,00}$	$\frac{1}{0,4}$	$\frac{1}{0,4}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{0}{0,00}$	$\frac{3}{1,1}$	$\frac{0}{0,00}$	0,5 2	0,2 0	1,36	2,4 6	>0,00 5

However, although nephrocomorbidity has clinical significance, it should be noted that the II and R values confirm these results as not statistically significant [II=0.17 – 16.58; Xi2=0.21; R>0.05]. It was revealed from the analysis that gastroenterological and

neuroendocrine comorbidity factors are not significant in the development of mixed glaucoma [RR= 0.86; 0.52; II=0.1 – 7.25; 0.2 – 1.36; Xi2=0.02; 2.46; R>0.05; 0.05].

Table 9 presents the impact of comorbidity on terminal glaucoma and 4-year changes.



9– table

Epidemiological description of comorbidity in terminal glaucoma and 4-year changes in gerontological age population

Types of comorbidity	Total glaucoma (n=266)								RR	ИИ		Хи ²	p
	Men(n=113)				Women (n=153)					ю↑	κ↓		
	2015	2016	2017	2018	2015	2016	2017	2018					
I	$\frac{5}{1,9}$	$\frac{4}{1,5}$	$\frac{9}{3,4}$	$\frac{9}{3,4}$	$\frac{6}{2,3}$	$\frac{2}{0,8}$	$\frac{6}{2,3}$	$\frac{6}{2,3}$	1.49	0.90	2.49	8.51	<0.005
II	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{1}{0,4}$	$\frac{0}{0,0}$	$\frac{2}{0,8}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	3.07	0.71	13.25	2.68	>0.005
III	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{1}{0,4}$	$\frac{1}{0,4}$	$\frac{1}{0,4}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	15.11	1.54	48.24	10.01	<0.005
IV	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{1}{0,4}$	$\frac{1}{0,4}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	2.05	0.39	10.83	0.78	>0.005
V	$\frac{2}{0,8}$	$\frac{3}{1,1}$	$\frac{7}{2,6}$	$\frac{1}{0,4}$	$\frac{1}{0,4}$	$\frac{3}{1,1}$	$\frac{8}{3,0}$	$\frac{5}{1,5}$	4.71	2.47	8.97	56.49	<0.005

Note: rate - absolute number, denominator - percentage; I – KKOM, II – PKOM, III – NKOM, IV – GEKOM, V – NEKOM.

It is clear from them that regardless of the type of comorbidity, the frequency of onset and progression of terminal glaucoma in the elderly population increases statistically reliably/significantly [RR= 1.49; 3.07; 15.11; 2.05; 4.71].

Comorbidity was noted with the following distribution frequency in men and women of gerontological age with a difference in the observation years: in 2015 - from 1.9 and 2.3 percent, in 2016 from 1.5 and 0.8 percent, in 2017 - from 3.4 and 2.3 percent, in 2018 – 3.4 and 2.3 percent [RR=1.49; II=0.90 – 2.49; Xi2=8.51; R<0.005]. Pulmonological comorbidity with glaucoma is confirmed in different years with a very low prevalence (0.4 and no more than 0.8 percent) [RR=3.07; II=0.71–13.25; Xi2=2.68; R>0.005]. With the same clinico-epidemiological description, in terminal glaucoma, nephrocomorbidity is described [RR=15.11; II=1.54 – 148.24; Xi2=148.24; Xi2=10.01; R<0.005]. But the statistical reliability and significance of the association attract attention.

Gastroenterological comorbidity was observed in terminal glaucoma, in different years, with a frequency not exceeding 0.4

percent, and the level of association between it and the origin of glaucoma was estimated as not significant [RR=2.05; II=0.39 – 10.83; Xi2=0.78; R>0.005].

Neuro-endocrine diseases are represented by the following distribution frequencies and connection characteristics in the examined population of patients with glaucoma (in gerontological age): 2015 - 0.8 percent and 0.4 percent, respectively, in men and women; In 2016 - from 1.1 and 1.1 percent, in 2017 - from 2.6 and 3.0 percent, in 2018 from 0.4 and 1.5 percent [RR=4.71; II=2.47 - 8.97 ; Xi2=56.49; R<0.005].

Epidemiological descriptions of the effects of various forms of comorbidity (KKOM, PKOM, NKOM, GEKOM, NECOM) on glaucoma attacks and 4-year changes are presented in the next 10-table.

The following conclusions are drawn from their mathematical analysis:

- 1) the influence of the comorbidity factor in the origin of glaucoma attacks is present at a significant or insignificant level;
- 2) effects of cardio-comorbidity, pulmonary comorbidity, gastroentero-co-morbidity and neuro-endocrinological co-morbidity are



clinically significant [RR= 1.62; 1.71; 2.05; 1.25]; 3) cardio comorbidity is confirmed as statistically significant in Fisher's R value in the development of glaucoma attack ($\chi^2=10.22$; $R<0.05$); 4) although pulmonary comorbidity,

gastroenterological comorbidity, neuroendocrine and nephrocomorbidities have clinical significance in the origin of glaucoma attacks,

10– table

Description of glaucoma attacks and 4-year changes under the influence of comorbidity in the gerontological age population

Types of comorbidity	Total glaucoma (n=266)								RR	ИИ		χ^2	p
	Men(n=113)				Women (n=153)					ю ↑	к↓		
	2015	2016	2017	2018	2015	2016	2017	2018					
I	$\frac{5}{1,9}$	$\frac{3}{1,1}$	$\frac{1}{0,4}$	$\frac{4}{1,5}$	$\frac{1}{0,4}$	$\frac{3}{1,1}$	$\frac{6}{2,3}$	$\frac{8}{3,0}$	1,6 2	0.8 3	3,15	10,2 2	<0.00 5
II	$\frac{0}{0,0}$	$\frac{1}{0,4}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{1}{0,4}$	$\frac{0}{0,0}$	1.7 1	0.3 4	8.71	0.45	>0.00 5
III	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	0,0 0			0.80	>0.00 5
IV	$\frac{0}{0,0}$	$\frac{1}{0,4}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	$\frac{1}{0,4}$	$\frac{0}{0,0}$	$\frac{0}{0,0}$	2.0 5	0.3 9	10.8 3	0.78	>0.00 5
V	$\frac{1}{0,4}$	$\frac{0}{0,0}$	$\frac{1}{0,4}$	$\frac{0}{0,0}$	$\frac{1}{0,4}$	$\frac{3}{1,1}$	$\frac{5}{1,9}$	$\frac{0}{0,0}$	1.2 5	0.6 0	2.58	0.55	>0.00 5

The fact that the confidence interval crossed 1 and the value of Fisher's R was the basis for concluding that these results do not have statistical significance ($II=0.34 - 8.71$; $0.39 - 10.83$; $0.6 - 2.58$; $\chi^2 = 0.45$; 0.78 ; 0.55 ; $R > 0.05$; > 0.05 ; > 0.005).

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Annotation

Therapeutic comorbidity is confirmed as a risk factor in the formation and clinical course of glaucoma. The remission of all forms of glaucoma - significant and non-significant, statistically and clinically significant or insignificant is confirmed in KKOM, PKOM, GEKOM, NKOM and NEKOM.

Addressing them in elderly glaucoma client populations will undoubtedly have medical, social, and economic benefits if they are accounted for and modified according to treatment–prevention algorithms.

Key words: glaucoma, risk factors, geront population, prevention, screening strategies.

