



PHARMACOEPIDEMOLOGY OF GLAUCOMA IN UKRAINE

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Abstract. The aim of the study was to determine gender and age peculiarities and concomitant pathology of glaucoma patients by retrospective hospital chart analysis. The level of primary disability was also studied. The analysis of gender and age composition of glaucoma patients who were hospitalized to the Eye Microsurgery Department of Vinnitsia Regional Pyrohov Memorial Clinical Hospital during 2008 - 2012 years showed that the incidence of glaucoma in the structure was dominated by male patients aged 61 to 74 years. Studying the structure of comorbidities showed that concomitant pathology of the vision was mostly presented by cataract, and nonophthalmic diseases such as atherosclerotic heart disease and hypertension. The total amount of disabled people due to primary open-angle glaucoma during 2008-2012 years was found equal to 289. More than 46 % of these people had the 3rd disability group.

Keywords: glaucoma, gender and age features, comorbidity, disability.

Introduction

Despite the achievements of modern medicine, glaucoma remains one of the most important medical and social problems of modern ophthalmology, as far as it occurs in people of working age and leads to visual disability, and, therefore, requires substantial financial costs not only for each individual patient, but also for the state as a whole (Dec.gov.ua, 2011; Nesterov, 2008; European Glaucoma Society, 2008). In recent times we have observed a trend towards the rejuvenation of the disease, which may be associated with both an improvement of diagnostic procedures, deterioration of environmental conditions and an increase in occurrence of bad habits (Volkov, 2008; Duglas, 2010; Nesterov, 2008). Also controversial is the question of gender features of glaucoma, both in Ukraine and in the world as a whole. The European studies show a higher prevalence of glaucoma among men, although the statistics was presented with no separation by race and age (Duglas, 2010; Damji, 2010; WHO.int, 2011; European Glaucoma Society, 2008). No similar studies among the population of Ukraine have been conducted yet, so it is impossible to project the European statistics with a high degree of probability on the population of Ukrainian regions.

World literature has no reliable data available on the relationship of glaucoma with other diseases. At the same time it is proved that the progression of primary glaucoma being a hereditary disease is directly dependent on the presence of concomitant diseases (WHO.int, 2011; European Glaucoma Society, 2008). Thus, the most careful attention should be paid to hypertension and diabetes, which leads to severe metabolic disturbances in older age.

Therefore, the purpose of the study was to investigate gender-and-age characteristics and comorbidities in patients with glaucoma.

Method

The retrospective analysis of medical cases of patients admitted to the Eye Microsurgery Department of M.I. Pyrohov Vinnitsia Regional Clinical Hospital (VOKB), as well as to analyze the level of primary disability in patients with glaucoma based on data from Medical Social Expert Commission of Vinnitsia region for 2008-2012.

The data was processed using the statistical method of STATISTIKA 10.0 and Microsoft Excel software: arithmetic mean (M) and mean arithmetic error (m) were calculated for all indicators. Index of reliability (P) was also calculated using Student's t test (t).

Results

Gender and age features of glaucoma

The subject population consisted of 1418 patients from the VOKB Eye Microsurgery Department diagnosed with primary open-angle glaucoma (POAG) (841 male and 577 – female) aged 14 to 92 years (mean age – 67.12 ± 7.64). The sample was divided into 2 groups by gender: I – male patients, II – women. Each studied group was subdivided into 7 subgroups according to the scheme of ontogenesis periodization: A – minor patients, B – adolescent patients, C – patients of I mature age, D – patients of II mature age, E – elderly patients, F – senile patients and G – centenarian patients.

Due to absence of female adolescent patients and female centenarians in a sample, only 12 study groups were established:

IA: 1 male patient aged 14;

IB: 6 minor patients with glaucoma (the average age in the group 19.67 ± 1.11 years);

IC: 8 male patients diagnosed POAG (the average age in the group 30.50 ± 2.25 years);

ID: 197 male patients with glaucoma (the average age in the group 54.99 ± 3.80 years);

IE: 496 male elderly patients (the average age in the group 67.94 ± 3.35 years);

IF: 132 male patients diagnosed POAG (the average age in the group 78.35 ± 2.37 years);

IG: 1 male centenarian patient with glaucoma aged 92;

IIB: 1 female adolescent patient aged 18;

IIC: 7 female patients with glaucoma (the average age in the group 34.57 ± 0.49 years);

IID: 41 female patients diagnosed POAG (the average age in the group 47.54 ± 5.76 years);

IIE: 359 female patients with glaucoma (the average age in the group 67.49 ± 3.98 years);

IIF: 169 female patients with glaucoma (the average age in the group 79.26 ± 2.68 years).

It was found that glaucoma was prevalent in male patients – 59.31% compared with 40.69% in females (Fig. 1), which corresponds to general European trend.

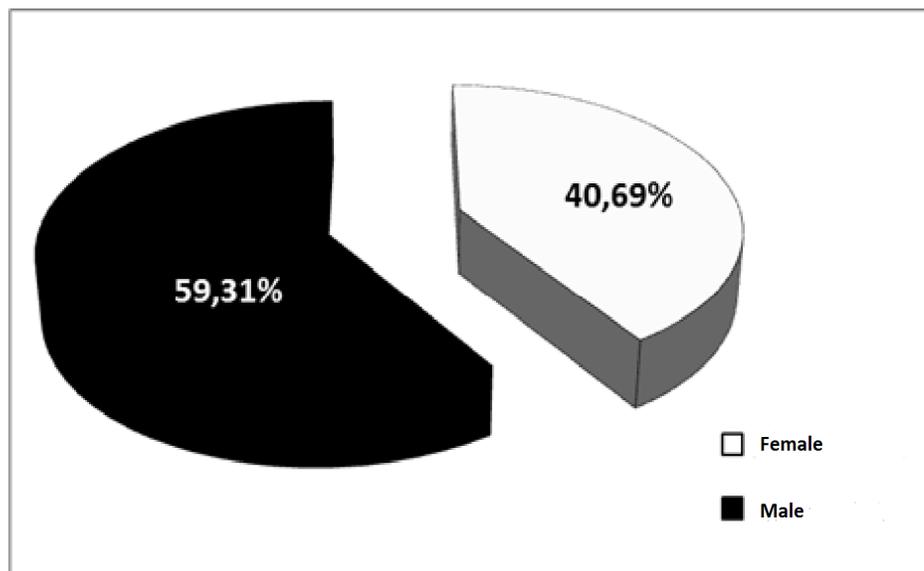


Fig 1. The gender structure of glaucoma

The prevalence of glaucoma in men is typical not only for the study population as a whole, but for most individual age groups. Thus, the highest prevalence of glaucoma was observed in the group I E (male patients aged from 61 to 74 years (elderly patients)) and corresponded to to 34.98% (in volume terms - 496 patients).

The portion of female patients in the reference age group - II E – is smaller, and corresponds to 25.32% ($n = 359$). The incidence of glaucoma in men and women from D group is significantly different (patients of II mature age): 13.89% vs. 2.89%. Also, a high prevalence of glaucoma was observed in both male (9.31%) and female (1.92%) elderly patients (Fig. 2).

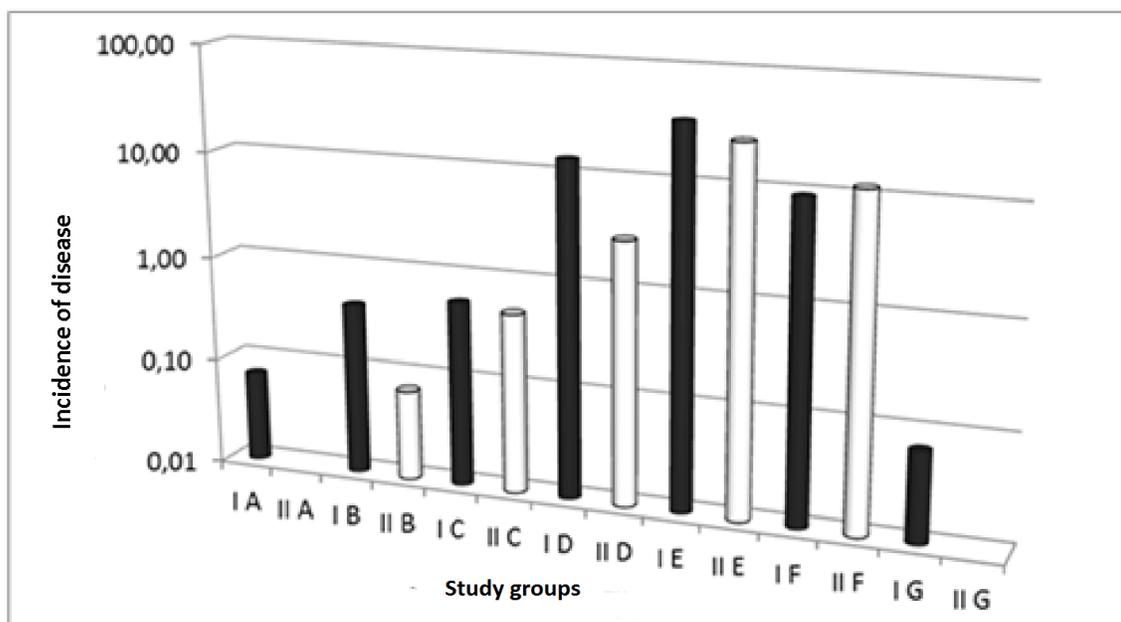


Fig 2. Gender-and-age structure of glaucoma incidence

Note: ■ – male patients, □ – female patients.

As a result of more detailed analysis of the age structure of patients within gender groups, it was found that the prevalence of glaucoma among working-age men was more than three times the rate of diagnosis of primary open angle glaucoma in women from corresponding age groups (25.20% and 8.32%, respectively). The second largest age group of patients with glaucoma among men was D subgroup (II mature age). At the same time, this feature among female patients corresponds to F subgroup (elderly patients) (Fig. 3).

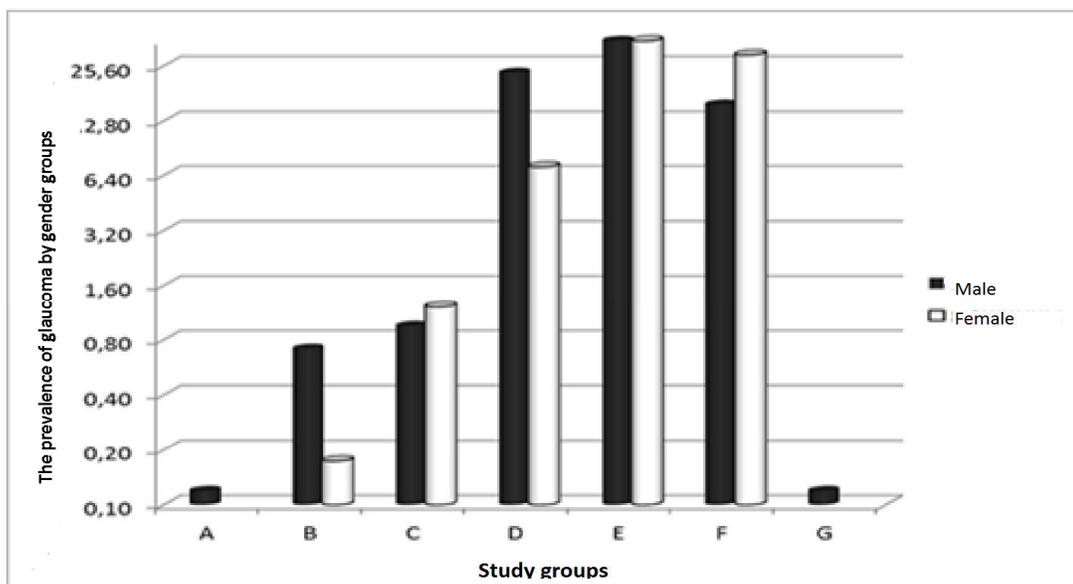


Fig 3. The age structure of glaucoma by gender

Analysis of comorbidity structure

Ophthalmic and cardiovascular diseases (Table 1) dominate in the structure of comorbidity for the majority of patients diagnosed POAG. Moreover, the diseases of the endocrine and broncho-pulmonary system, gastrointestinal tract and musculoskeletal system also occur.

Table 1

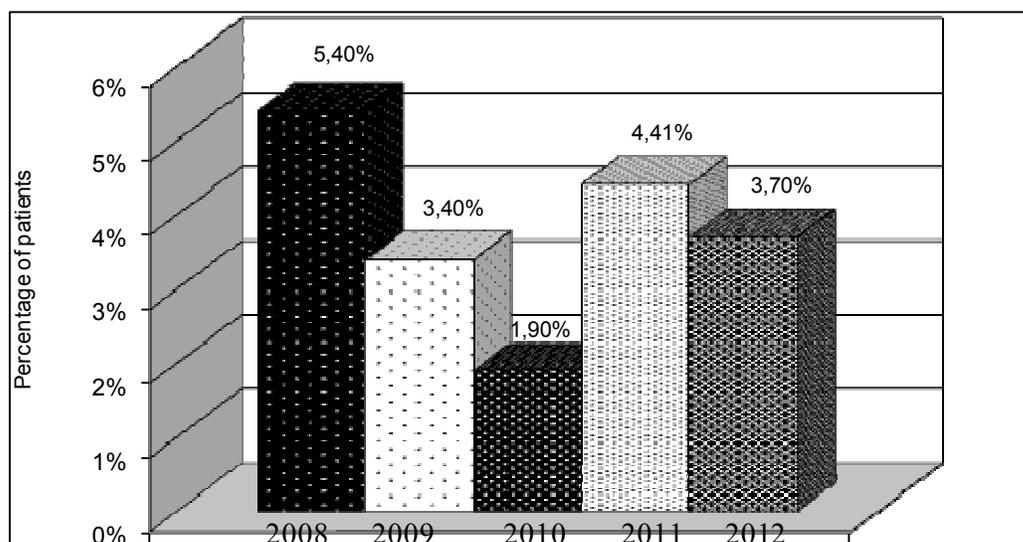
The structure of comorbidity in patients with glaucoma

Pathology	Year				
	2008	2009	2010	2011	2012
Ophthalmic	72.44	70.57	72.29	79.32	79.42
Cardiovascular	71.02	69.43	74.90	70.17	73.25
Endocrine	8.24	6.42	7.60	6.44	9.88
Broncho-pulmonary	6.25	3.77	4.56	2.71	3.29
Gastrointestinal	1.42	1.89	2.28	2.03	0.82
Musculoskeletal	0.85	1.13	3.42	1.02	1.65

The results of studying the concomitant ophthalmic diseases in patients diagnosed primary open angle glaucoma indicated the substantial prevalence of cataract (1045 patients – 73.7%). Moreover, the study of this dependence in dynamics evidenced increasing concomitant diagnosis of cataract by more than 33% over the period 2008-2012. 97 patients (6.84%) were diagnosed retinopathy, 31 (2.19%) – myopia, 21 and 20 patients, respectively, iridocyclitis and optic atrophy. Less common eye diseases were macular degeneration, retinal detachment, pterygium, aphakia and astigmatism.

The largest portion in the structure of extraocular comorbidity belongs to diseases of cardiovascular system: 844 patients of 1418 glaucoma patients admitted to a hospital for 5 years were diagnosed atherosclerotic heart disease, corresponding to 59.5%. A significant number of patients (426 – 30.04%) were also diagnosed hypertension. In addition, within the reference period (2008-2012) we witnessed a tendency of higher numbers of patients with hypertension (from 25.82% to 35.59%) and heart failure (from 4.82% to 10.85%). Angina (4.02%), heart failure (7.12%) and myocardial infarction (0.49%) also had shares in the structure of cardiovascular pathology.

Endocrine disorders (I and II-type diabetes) was present in 3.88% (55 patients) of the total number of hospitalized with diagnosis of POAG for 5 years. It's worthy to note that the lowest level of endocrine pathology was registered at the level of 1.90% in 2010, and the highest – 5.40% – in 2008.

**Fig 4.** The prevalence of endocrine pathology

49 patients diagnosed POAG of 1418 of total study subjects hospitalized during 5 years – 3.46% – had concomitant broncho-pulmonary disorders (chronic bronchitis, chronic obstructive pulmonary disease). It's worthy to note a positive trend in terms of three-fold reduction in a number of patients with the above comorbidity (2.06% in 2012 compared with 6.25% in 2008). More than 1% of patients were also noted the presence of diseases of the musculoskeletal (osteochondrosis, arthritis) and gastrointestinal (gastroduodenitis, chronic pancreatitis) systems (Table 2).

Table 2

Prevalence of other concomitant pathologies							
Year	Total number of patient	Diseases					
		Musculoskeletal system		Gastrointestinal system		Broncho-pulmonary system	
		Abs., subjects	Per cent, %	Abs., subjects	Per cent, %	Abs., subjects	Per cent, %
2008	352	3	0.85	3	0.85	22	6.25
2009	265	2	0.75	1	0.38	10	3.77
2010	263	5	1.90	2	0.76	5	1.90
2011	295	1	0.34	4	1.36	7	2.37
2012	243	4	1.65	3	1.23	5	2.06

Analysis of indicators of primary disability for glaucoma

Despite the achievements in diagnostics and pharmacotherapy in ophthalmology, the proportion of glaucoma among the causes of visual disability in our country over the past decade has increased from 6% to 16% – visual disability of every fifth patient has been preconditioned with glaucoma.

In Vinnytsia region, the primary disability for glaucoma during the period from 2008 to 2012 was recognized in 289 patients. 99 patients (34.26%) were recognized I group disability, 57 (19.72%) – II group disability, and 133 patients (46.02%) were recognized III group disability (Table 3).

In 2008, the number of patients recognized I and II disability groups was equal and 4% less patients were recognized group III. In 2009, on the background of sharp reduction in the number of patients recognized disability group II for glaucoma, the percent of group III disabled patients sharply rose from 34.78% to 48.00% (over 1.5 times).

Table 3

Structure of disability for glaucoma in Vinnytsia region							
Year	Disability groups						Total
	I		II		III		
	Abs.	Per cent (%)	Abs.	Per cent (%)	Abs.	Per cent (%)	Abs.
2008	16	34.78	16	34.78	14	30.44	46
2009	19	38.00	7	14.00	24	48.00	50
2010	14	25.93	9	16.67	31	57.40	54
2011	26	33.77	16	20.78	35	45.45	77
2012	24	38.71	9	14.52	29	46.77	62
Total	99	34.26	57	19.72	133	46.02	289

In 2010, a number of patients recognized disabled group III, which accounted for 57.4% of the total number of persons with disabilities for glaucoma during this period. Maximum absolute indicators of primary disability for glaucoma was reported in 2011 – 77 people were recognized disabled for glaucoma. That year was also remarkable for maximum absolute figures of groups I and III disabled persons – 26 and 35 patients, respectively (Fig. 5).

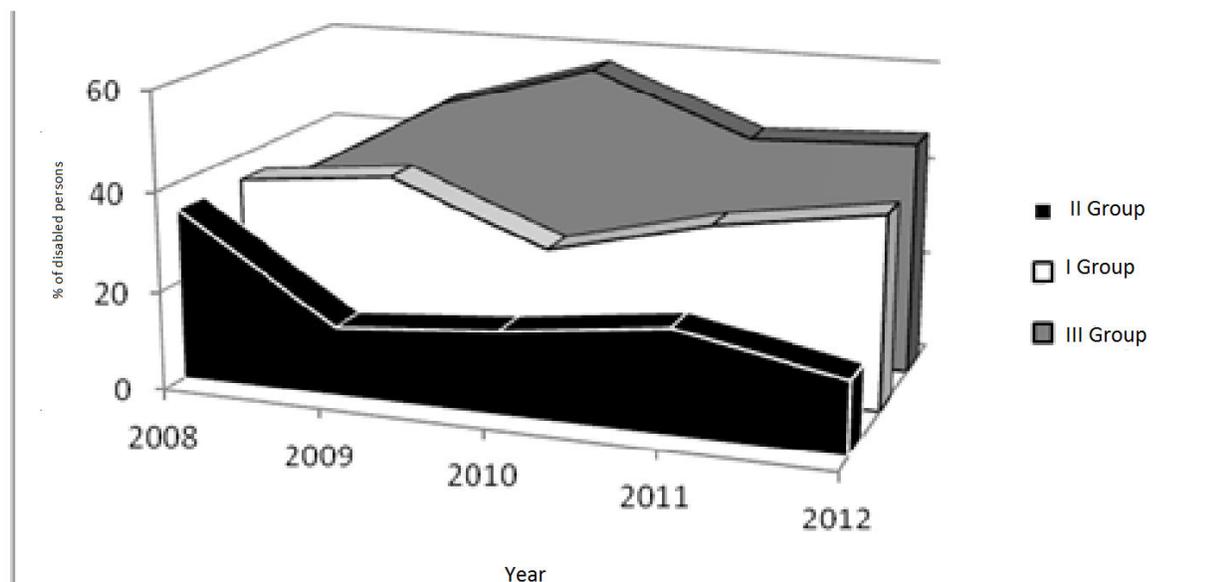


Fig 5. The dynamics of disability for glaucoma in 2008-2012

One may note a decline in the overall primary disability for glaucoma in 2012, which may indicate both high level of early diagnosis of the disease and application of optimal drug regimens for treatment POAG, that made possible to achieve and stabilize target intraocular pressure in patients.

Discussion

Data obtained from the gender-and-age analysis of patients with glaucoma admitted to the Eye Microsurgery Department of M.I. Pyrohov Vinnytsia Regional Clinical Hospital, allow to predict the number of newly diagnosed patients with glaucoma among different age groups and, if necessary, to adjust the activities of the regional ophthalmologic service.

The study of the structure of comorbidity revealed that the highest percentage of visual pathology was attributive to cataract (73.7%), which corresponded to its prevalence among the elderly people. Non-ophthalmic pathologies were presented mainly by atherosclerotic heart disease (59.52%) and arterial hypertension (30.04%), evidencing the need for increased attention to primary detection of glaucoma in the specified group of patients. At the same time, diabetes was diagnosed only in 3.88% of patients, thus putting to doubt allegations of its direct relationship with manifestations of glaucoma.

While assessing the level of primary disability for glaucoma, it was found that the total number of disabled persons for glaucoma in 2008-2012 amounted to 289 people, more than 46% of whom were group III disabled persons. Consistently high (from 25.93% in 2010 to 38.71% in 2012) remained the number of group I disabled persons in the structure of disability for glaucoma. At the same time, reduction in a total number of persons with disability for glaucoma by 2012 indicates an improvement of examination methods.

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