

THE SIGNIFICANCE OF CLINICAL - DEMOGRAPHIC AND SOCIAL PARAMETERS IN THE EVALUATION OF THE QUALITY OF LIFE OF BLIND PEOPLE WITH GLAUCOMA AND DIABETIC RETINOPATHY

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Blindness represents a terminal stage of many ophthalmological diseases, prevents proper orientation in space and synchronised functioning of the organism as a whole and normal performance of everyday functions, activities and professional duties, because of its crucial influence in socialization and quality of life, with glaucoma and diabetic retinopathy as the most common causes of eventual loss of vision. The study aimed to examine the significance of clinical-demographic and social parameters in the evaluation of quality of life of blind people with glaucoma and diabetic retinopathy and to determine any differences in quality of life between these two conditions. The study enrolled 70 people with glaucoma and 70 with diabetic retinopathy, over the age of 18, in whom by way of ophthalmologic examination the diagnosis of blindness was established, in accordance with the MKB-classification and abiding by the examination protocol and using adequate equipment. The following clinicodemographic and social parameters were taken into account and analyzed: etiology, gender, age, place of living, occupational status, marital status, living conditions, Braille literacy, social life, comorbid conditions, mobility, selfcare ability, everyday activities, pain/inconvenience and anxiety/depression. The analysis of the clinical parameters of mobility, selfcare, everyday activities, pain/inconvenience, anxiety/depression and comorbid states indicate a significant contribution to better quality of life for blind people with glaucoma compared to those with diabetic retinopathy. The examinees were of both genders, came from urban and rural areas, most of them were not Braille literate, were over 65 years of age, married, with a place to live, pensioners, and in relation to these parameters there were no significant differences in quality of life assessed in the study. *Acta Medica Medianae* 2016;55(4):37-45.

Key words: blindness, glaucoma, diabetic retinopathy

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orientation and synchronised functioning of the organism as a whole and normal performance of everyday functions, activities and working duties, because of its crucial importance in socialization and for quality of life in general.

Glaucoma represents one of the most common reasons for blindness, which occurs in all ages, from neonates to the elderly. Clinically, it is manifests with non-specific symptoms and is often detected in the phase when the disease is in an advanced stage, associated with a serious decrease in sharpness of vision, with accompanying reduction of the ability to work, since glaucoma, in addition to its medical significance, has also got societal implications. It requires timely detection, accurate diagnosis with sophisticated techniques and doctrinal treatment and preventive actions with appropriate measures to reduce the risks of a definite loss of vision (1, 2).

Diabetes mellitus represents an endocrine disease associated with metabolic and vascular complications that affect many organs including the eyes, where they cause pathological changes in the form of diabetic retinopathy. Proliferative

Introduction

Blindness represents a terminal condition in the evolution and treatment of many ophthalmological diseases which prevents proper spatial

diabetic retinopathy represents the most serious ophthalmological complication of insulin dependent and insulin independent forms of diabetes mellitus (type 1, type 2), which leads to very serious damage to vision, which depending on the weight, disease evolution/course, clinical picture and type

of treatment, can lead to a definite loss of vision (3, 4).

The aim of the study

The study represented an analytical study, where 140 blind people with glaucoma and

Table 1. The structure of the examinees by gender

Gender		Disease		Total
		Glaucoma	Diabetic retinopathy	
Male	N	36	35	71
	%	51,43%	50%	50,71%
Female	N	34	35	69
	%	48,57%	50%	49,29%
Total	N	70	70	140
	%	50%	50%	100%

Pearson Chi-square=0,460526, df=1, p=0,0497380

Table No. 2 The structure of the examined people by age

Age groups	Glaucoma		Diabetic retinopathy	
	N	%	N	%
20-30 y.	2	2.86	2	2.86
31-40 y.	3	4.29	3	4.29
41-50 y.	6	8.57	8	11.43
51-60 y.	12	17.14	12	17.14
> 60 y.	47	67.14	45	64.29
Total	70	100	70	100

Mann-Whitney U Test Z=0,2528 p=0,06929

Table 3. The structure of examined people according to the place of residence

Age groups	Glaucoma		Diabetic retinopathy	
	N	%	N	%
20-30 y.	2	2.86	2	2.86
31-40 y.	3	4.29	3	4.29
41-50 y.	6	8.57	8	11.43
51-60 y.	12	17.14	12	17.14
> 60 y.	47	67.14	45	64.29
Total	70	100	70	100

Pearson Chi-square= 0,3875, df=1, p=0,06012

Table 4. Occupational status of the examinees

Occupational status		Disease		Total
		Glaucoma	Diabetic retinopathy	
Pupil/Student	N	0	1	1
	%	0%	1,43%	
Employ	N	7	11	18
	%	10%	30%	
Unemploy	N	29	26	55
	%	41,43%	30%	
Pensioner	N	34	32	66
	%	48,57%	38,57%	
Total	N	70	70	140
	%	50%	50%	100%

Pearson Chi-square=10,0833, df=3, p=0,0287

diabetic retinopathy were included and was realized in the period September - October 2015. The examinees were enrolled based on the inclusion criteria, where 70 blind people with glaucoma with an open angle were included, as well as 70 blind people with different stages of proliferative form of diabetic retinopathy from different cities in the RM.

The diagnoses of blindness and clinical forms of glaucoma and diabetic retinopathy were made based on clinical and ophthalmological examinations performed with sophisticated ophthalmological equipment and following the adequate protocols, as well as using other medical documentation and documentation verified by the association of blind people which the examinees belonged to. A damage to the vision was determined using the MKB-10 classification, whereas, the people with the better eye, with the best correction, with sharp vision $<3/60$ (or $<0,05$) were classified as blind people or a visual field to the central part $<10^\circ$, under the condition that the loss of vision is definite and with a medical or surgical and that with another type of therapy it can not be amended (5, 6).

The study involved blind people over the age of 18 for which clinical-demographic parameters of etiology were analysed, gender and age, and their quality of life was accounted for via the analysis of parameters related to their place of living, occupational status, marital status, housing conditions, recognition of the Braille alphabet, social life, comorbid conditions, while the parameters of mobility, self-care, everyday activities, pain/inconvenience and anxiety/depression were examined using the standardized questionnaire EQ-5D-5L, version 2 from 2009, designed by the EuroQol Group.

The statistical elaboration of information was made using the steps from descriptive and comparative statistics, where the program Statistics for Windows 7,0 and SPSS 17,0 was used, for the confirmation of statistical significance with a significance cut-off value set at $p < 0.05$. The obtained results of the research are shown in tables, graphs, and as numeric values.

Results

The study enrolled 140 people with blindness, according to their disease etiology: 70 people with blindness was caused by glaucoma, and the remaining 70 in whom blindness was caused by diabetic retinopathy.

Among the affected people with glaucoma, 62 were diagnosed with glaucoma with an open angle and 8 with glaucoma with a closed angle.

Among the 70 people affected by diabetic retinopathy, 13 were with an advanced phase of pre-proliferative disease form, and the remaining 57 in the proliferative and contractive-cicatricant phase of the proliferative form.

The structure of the studied people by gender is shown in Table 1; 71 people (50,71%)

were male, 69 (49,29%) were female; among the 70 blind people with glaucoma, 36 (51,4%) were male, and 34 (48,6%) were female; among the 70 people with diabetic retinopathy, 35 (50%) were male, and 35 (50%) were female.

For $p > 0.05$, there was not any statistically significant difference between the people with glaucoma and those with diabetic retinopathy regarding the factor of gender (Pearson Chi-square = 0,461, $df = 1$, $p = 0,04974$).

The structure of examined people by age is shown in Table 2. Among all the people affected by glaucoma and diabetic retinopathy, 92 (65,71%) were over 60 years of age. Among those affected with glaucoma, 47 people (67,14%) were over 60 years of age, and among those with diabetic retinopathy, 45 (64,29%) were over 65 years of age. For $p > 0.05$, a statistically significant difference did not exist between the two diseases regarding the factor of age. (Mann-Whitney U Test $Z = 0,2528$ $p = 0,06929$).

The structure of the examinees according to their place of living (urban and rural environment) is shown in Table 3.

Among the 70 blind people with glaucoma, 55 (78,57%) lived in a town, 15 (21,43%) lived in a village; among the people with diabetic retinopathy, 53 (75,71%) lived in a town, 17 (24,29%) lived in a village. For $p > 0.05$, a statistically significant difference between the people affected by the two diseases was not seen regarding the factor of their place of living. (Pearson Chi-square = 0,3875, $df = 1$, $p = 0,06012$).

The occupational status of the examinees is shown in Table 4. Of the total number of examinees, 66 people (47,14%) were pensioners, 55 people (39,29%) were unemployed, and 18 (17,29%) were employed. Among those affected by glaucoma, 7 people (10%) were employed, and among those with diabetic retinopathy, 11 were employed (15,71%). For $p < 0.05$, a significant difference was detected for those employed who had diabetic retinopathy (Pearson Chi-square = 10,0332, $df = 3$, $p = 0,0287$).

The marital status of the examinees is shown in Table 5. Of the total number of examinees, the majority, 104 people (74,29%), were married, among whom 51 (72,86%) were affected by glaucoma, and 53 (75,71%) had diabetic retinopathy. For $p > 0.05$, a significant difference was not present between the people of both groups regarding their marital status (Pearson Chi-square = 0,356, $df = 1$, $p = 0,078$).

The living conditions of the examinees is shown in Table 6. The majority of examinees, 130 (92,86%) lived in their own house/flat, out of which 66 (94,29%) had glaucoma and 64 (91,43%) diabetic retinopathy. For $p > 0.05$, a significant difference between the examinees of both groups regarding their living conditions did not exist (Fisher exact test: two tailed $p = 0,0787$).

The examinees in the study were also analysed as to their knowledge and use of the Braille alphabet (Table 7). Among these 140 examinees,

Table 5. Marital status of the examinees

Marital status		Disease		Total
		Glaucoma	D.Retinopathy	
Single	N	19	17	36
	%	28,57%	25,71%	
Married	N	51	53	104
	%	71,43%	74,29%	
Total	N	70	70	140
	%	50%	50%	100%

Pearson Chi-square= 0,3569, df=1, p=0,078

Table 6. Housing conditions of the examinees

Housing conditions		Disease		Total
		Glaucoma	Diabetic retinopathy	
Under rent	N	4	6	10
	%	5,71%	8,57%	
Own House/appartment	N	66	64	130
	%	94,29%	91,43%	
Total	N	70	70	140
	%	49,28%	50,72%	100%

Fisher exact test: two tailed p=0,0787

Table 7. The structure of examinees according to recognition of the Braille alphabet

Recognition of the Braille alphabet		Disease		Total
		Glaucoma	Diabetic retinopathy	
Yes	N	8	2	17
	%	11,43%	2,86%	
No	N	62	68	123
	%	88,57%	97,14%	
Total	N	70	70	140
	%	50%	50%	100%

Yates corrected=4,29 p=0,0366

Table 8. The analysis of socialising of the examinees

Socialising with friends		Disease		Total
		Glaucoma	Diabetic retinopathy	
Regular	N	27	30	57
	%	38,57%	42,86%	
Rare	N	43	40	83
	%	61,43%	57,14%	
Total	N	70	70	140
	%	50%	50%	100%

Pearson Chi-square= 10,188 df=3, p=0,06133

Table 9. Comorbid conditions in the examinees

Other chronic diseases		Group		Total
		Glaucoma	Diabetic retinopathy	
Yes	N	16	42	58
	%	22,86%	60%	41,43%
No	N	54	28	82
	%	77,14%	40%	58,57%
Total	N	70	70	140
	%	50%	50%	100%

Pearson Chi-square= 5,39291, df=1, p=0,012

Table 10. EQ-5D-5L dimensions in examinees with diabetic retinopathy

EQ-5D-5L dimension		Males	Females	Total
Mobility	Level 1	1,43%	0,00%	1,43%
	Level 3	28,57%	27,14%	55,71%
	Level 4	20%	21,43%	41,43%
	Level 5	1,43%	0,00%	1,43%
Self care	Level 1	0%	1,43%	1,43%
	Level 2	11,43%	8,57%	20%
	Level 3	38,57%	37,14%	75,71%
	Level 4	1,43%	1,43%	2,86%
Everyday activities	Level 3	20%	22,86%	42,86%
	Level 4	31,43%	25,71%	57,14%
Pain/ Inconvenience	Level 1	37,14%	44,29%	81,43%
	Level 2	7,14%	1,43%	8,57%
	Level 3	7,14%	2,86%	10%
Anxiety/ Depression	Level 1	12,86%	12,86%	25,71%
	Level 2	18,57%	22,86%	41,43%
	Level 3	17,14%	12,86%	30%
	Level 4	2,86%	0,00%	2,86%

Level 1: no problems; Level 2: little problems;

Level 3: moderate problems;

Level 4: difficult problems;

Level 5: extremely difficult problems

Table 11. EQ-5D-5L dimension with examinees with glaucoma

EQ-5D-5L димензија		Males	Females	Total
Mobility	Level 1	2,86%	11,43%	14,29%
	Level 2	40%	25,71%	65,71%
	Level 3	12,86%	5,71%	18,57%
	Level 4	1,43%	0,00%	1,43%
Self care	Level 1	20%	35,71%	55,71%
	Level 2	32,86%	2,86%	35,71%
	Level 3	4,29%	4,29%	8,57%
Everyday activities	Level 1	2,86%	7,14%	10%
	Level 2	40%	28,57%	68,57%
	Level 3	12,86%	7,14%	20%
	Level 4	1,43%	0,00%	1,43%
Pain/ Inconvenience	Level 1	44,29%	37,14%	81,43%
	Level 2	12,86%	4,29%	17,14%
	Level 4	0,00%	1,43%	1,43%
Anxiety/ Depression	Level 1	24,29%	15,71%	40%
	Level 2	24,29%	20%	44,29%
	Level 3	8,57%	7,14%	15,71%

Level1:no problems; Level2: slight problems;Level3: moderate problems;

Level4: difficult problems;

Level5:extremely difficult problems

Table 12. Index values ofEQ-5D-5Lwith people with diabetic retinopathy and glaucoma

EQ - index	Disease	
	Diabetic retinopathy	Glaucoma
Median	2,6	1,6
25th	2,4	1,4
70 th	3	2
Total	70	70

only 10 people (14,29%) could use the Braille alphabet; 62 people (88,57%) affected by glaucoma and 68 (97,14%) affected with diabetic retinopathy could not recognize the Braille alphabet and could not use Braille letters. For $p < 0.05$, a statistically significant difference did exist regarding Braille literacy, where Braille literacy was most common among the blind with glaucoma. (Yates corrected = 4,29 $p = 0,0366$).

The results concerning social life of the examinees in their own homes and out of their homes are shown in Table 8. The majority of the examinees, 83 (59,29%) rarely mingled with friends out of their homes, out of which 27 (38,57%) had glaucoma and 30 (42,86%) diabetic retinopathy. For $p > 0.05$, a statistically significant difference did not exist regarding out-of-home social life among the studied groups (Pearson Chi-square = 10,188, $df = 3$, $p = 0,06133$).

The following comorbid conditions were analyzed in the examinees: hypertension, cardiovascular, osteoarticular, and kidney diseases (Table 9).

Among all the examinees, 58 people (41,43%) were diagnosed with comorbidities, of which 42 (60%) were those with diabetic retinopathy, and 16 (22,86%) with glaucoma. For $p < 0,05$, a statistically significant difference did exist mostly in those affected by comorbid conditions with people with diabetic retinopathy (Pearson Chi-square = 5,393, $df = 1$, $p = 0,12$).

The results of the study regarding personal mobility, self-care, everyday activities, pain/inconvenience and anxiety/depression are shown in Table 10 and Table 11.

The rate of the score for EQ-5D-5L indexes which concern the mentioned parameters in both groups (blind people with diabetic retinopathy and glaucoma) is presented through the analysis of median and the 25th and 70th percentiles are shown in Table 12. The value of the median for blind people with diabetic retinopathy was 2,6, where more than 25% had a median higher than 2,4, and more than 75% had a median higher than 3. In blind people affected by glaucoma, the median amounted to 1,6, where more than 25% had a median over 1,4, and more than 75% had a median over 2.

For $p < 0.05$, the results showed that a significant difference did exist between the blind people with glaucoma compared to the blind with diabetic retinopathy, indicating a better quality of life of people with glaucoma (Mann-Whitney U Test: $Z = 8,706$, $p = 0,0225$). The obtained results showing a better quality of life for the blind people with glaucoma, compared to those with diabetic retinopathy, reflect the fact that people with diabetic retinopathy more commonly had comorbidities, which cumulatively negatively influenced their handicap and quality of life in general.

Discussion

Although gender is not directly associated with blindness, studies in the past have shown

that in Saudi Arabia 60% of all blind people are women; in other Arabic countries males predominate; in Bulgaria in the Pleven region both genders are equally affected, but in developed countries, females dominate in the areas where blindness is caused by senile macular degeneration and cataract (7-11).

The number of blind people around the world is growing with age; 31,7% of blind people are 45-59 years old, and 58% are over 60 years of age (12). Studied done in the USA, Netherlands, Bulgaria and Australia have had similar results (8, 13-17).

Damaged vision and blindness in well educated people is usually the consequence of intellectual work, burden and exposure of the eyes during reading and computer use, whereas with uneducated people, insufficient education plays an important role, as well as the lack of timely diagnosis and treatment of the eye, engagement in strenuous physical work, beside damage to the eyes, by injury, absence of sufficient protection while working, insufficient education, and because of the difficulty of physical activity. Recent research has shown that in people affected by glaucoma and diabetic retinopathy professional exposure does not have a decisive impact on the occurrence of blindness (18-23).

The way of life and place of residence in urban and rural areas as a risk factor is expressed, above all, in geographical regions with a low living standard, with people who live in nursing homes, people living in social institutions and others (24). Frequent serious vision disorders and blindness are more common in rural areas, especially in Africa, Latin America, Asia, India and other undeveloped regions with a low level of health protection (25, 26).

Blind people, because of their handicap, are physically limited in their communication with the environment; on the spiritual level, they are vulnerable and alienated, because of their perception of their living environment upon which they base and create symbols of the surroundings with the help of people in their immediate vicinity, whereas their socializing depends on their social status, ability to be educated, to work and earn to support their existence, to form a family, to use the Braille alphabet, to socialize with friends, etc. (27, 28).

Married life with blind people enables not only their physiological existence, satisfaction of their emotional and sexual needs, reproduction and generational existence, but it also promotes their personal dignity (29-32).

Loh K.Y., Masoume B., and West S.K. with their associates, examining the quality of life of blind people in the studies done in Malaysia and India by the factors of mobility, ability to perform everyday activities, and self care, have stated that these are in correlation with the degree of damage, that is, the impaired vision, and with the help of people from the surroundings, without whom the quality of their life would be limited (27, 28, 33, 34).

In the same study in America, where the psychosocial aspect is analysed in people with seriously damaged vision and blindness from macular degeneration, the results have shown alienation compared to the people with close relationships in their immediate social environment, and an increase in anxiety, depression and a decreased will and interest in the living habits and perspectives (35).

Conclusion

Mobility, self-care, everyday activities, feeling of pain/inconvenience, anxiety/depression

and comorbid conditions represent clinical indicators based on the evaluation of quality of life of the blind, and their analysis in our study indicates a significantly better quality of life of blind people with glaucoma, compared to those with diabetic retinopathy.

The examinees were of both genders, from urban and rural environments, were mostly Braille illiterate, most of them were over the age of 65, married, with homes and a working status as pensioners, and regarding these indicators there was not any significant difference between the examined groups of blind people with different diseases.

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Značaj kliničko-demografskih i socijalnih parametara u proceni kvaliteta života slepih osoba obolelih od glaukoma i dijabetične retinopatije

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Slepoća predstavlja terminalni stadijum u evoluciji i tretmanu mnogih oftalmoloških oboljenja, onemogućava pravilnu orijentaciju u prostoru i sinhronizovano funkcionisanje organizma u celini, normalno obavljanje svakodnevnih funkcija, aktivnosti i radnih obaveza, zbog čega ima suštinski uticaj u socijalizaciji i kvalitetu života ljudi, pri čemu su glaukom i dijabetična retinopatija najčešći uzroci koji mogu dovesti do definitivnog gubitka vida. Cilj rada bio je sagledavanje značaja kliničko-demografskih i socijalnih parametara u proceni kvaliteta života slepih lica obolelih od glaukoma i dijabetične retinopatije i utvrđivanje eventualne razlike u kvalitetu života između njih. Istraživanjem je bilo obuhvaćeno 70 lica obolelih od glaukoma i dijabetične retinopatije, uzrasta iznad 18 godina, kod kojih je oftalmološkim pregledom, urađenim prema adekvatnom protokolu i sa sofisticiranom aparaturom, a u korelaciji sa MKB-klasifikacijom, bila postavljena dijagnoza slepoće. Kod ispitanih lica bili su analizirani sledeći kliničko-demografski i socijalni parametri: etiologija, pol, uzrast, mesto stanovanja, radni status, bračni status, stambeni uslovi, poznavanje Brajove azbuke, druženje sa prijateljima, komorbidna stanja, mobilnost, sposobnost da se brinu sami o sebi, svakodnevne aktivnosti, bol/nelagodnost i anksioznost/depresija. Analiza parametara mobilnosti, sposobnosti da se brinu sami o sebi, svakodnevnih aktivnosti, osećaja bola/nelagodnosti, anksioznosti/depresije i komorbidnih stanja ukazuju na signifikantnost ovih parametara u prilog boljeg kvaliteta života slepih lica obolelih od glaukoma u poređenju sa osobama sa dijabetičkom retinopatijom. Ispitanici su bili oba pola, potiču iz urbanih i ruralnih sredina, najveći broj ne poznaje Brajovu azbuku, starosti su iznad 65 godina, žive u bračnoj zajednici, imaju rešeno stambeno pitanje, sa radnim statusom penzionera, i u odnosu na ove parametre ne postoji značajna razlika u procenjenom kvalitetu života. *Acta Medica Medianae* 2016;55(4):37-45.

Ključne reči: slepoća, glaukom, dijabetična retinopatija