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SOCIALDEMOGRAPHIC AND CLINICAL ASPECTS OF LOW VISION AMONGST ADULT POPULATION

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Low vision in adult population has a multicausal etiology, it interferes with the normal course and quality of living and adaptation in society of people with low vision, and that is why it represents not only a medical, but a social problem. The study was performed with the aim to understand the meaning of social and clinical characteristics of the appearance, evolution and course of low vision among the adults with ophthalmological diseases. The research includes 292 adults with low vision from many urban and rural areas, registered in the associations of people with low vision and blindness in RM with glaucoma, refraction anomalies, diabetic and pigment retinopathy and cataracta. The analysis of the social-demographic parameters of gender, age, place of living, marital status, working status, housing conditions, number of family members, doctor accessibility, type of treatment indicates that there are no significant differences in these parameters between males and females. People over 60 years of age are mostly prone to low vision, which does not represent a decisive handicap for socialisation compared to people with preserved vision, except in the areas of employment and livelihood provision. Glaucoma, diabetic retinopathy, cataracta, refraction anomalies and pigment retinopathy in our research represent the most common ophthalmological diseases which evolve into the most severe form of low vision. The period from diagnosis to the status of severe low vision is variable, long-lasting and in most cases is 15-20 years, which gives the opportunity for a successful prevention of blindness, with a timely diagnosis and treatment of these diseases. *Acta Medica Medianae 2017;56(3):17-24.*

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Introduction

Low vision among adults has a multicausal etiology, it interferes with the normal course and quality of living and the adaptation in society of people with low vision, and that is why it causes not only medical, but also social problems. The study of the role and significance of social factors, together with clinical ones, will contribute to a lower prevalence and prevention of this severe ophthalmological and social problem.

The study involved people with severe low vision, with vision sharpness with the best correction of the better eye 3/60 (or 0.05), but <6/18 (or 0.3) or visual field < 20°, representing a terminal stage of vision damage before the occurrence of blindness (1, 2).

Eye diseases manifested by low vision occur in all age groups, including neonates, in both genders, all professions, in people of different social strata, with a different social and living status; they can be primary, hereditary and secondary, whereas with adults with a severe form of low vision and blindness glaucoma, diabetic retinopathy, refraction anomalies, senile macular degeneration, complicated forms of cataracta and other diseases evolve.

Past researches show that severe form of low vision and blindness dominate in all regions around the world, especially in Asian and African states with multimillion population, low economical and social standard and poorly developed healthcare system, as well as low education (3, 4).

Aim

The paper was written with the aim to understand the meaning of the social and clinical characteristics in the appearance, evolution and

the course of low vision in adults affected with ophthalmological diseases.

Material and methods

The paper represents an analytical study performed in the period September-October 2015, including people with a severe form of low vision from many urban and rural areas from the central part of the Republic of Macedonia. We enrolled 292 people with low vision, glaucoma, refractional anomalies, diabetic retinopathy, cataracta and pigment retinopathy, with preserved vision 0.3-0.05, in whom social and clinical characteristics, evolution and the course of ophthalmological diseases were examined. The study was done aided by social medical history and a survey, clinical examinations with appropriate ophthlamological diagnostic procedures, and the degree of damaged vision was determined according to the MKB -10 classification.

Statistical data processing was done using the procedures of descriptive and comparative statistics, statistical programs Statistics for Windows 7.0 and SPSS 17.0 were used, and the level of statistical significance was set at $p < 0.05$.

The obtained results are shown in tables and numerically.

Results

The study analysed social-demographic and clinical characteristics of 292 people with low vision with preserved vision of 0.3-0.05, with glaucoma, diabetic retinopathy, refraction anomalies, cataracta and pigment retinopathy.

The following social-demographic characteristics were analyzed: gender, age, place of living, working status, marital status, housing conditions, number of family members and healthcare availability, as well as the following clinical factors: etiology, type of treatment, evolution and duration of the disease.

The structure of people with low vision

Table 1. The structure of people with low vision according to gender/etiology

Disease	Gender					
	Males		Females		Total	
	Number	%	Number	%	Number	%
Glaucoma	50	34,01	39	26,9	89	30,48
Retinopathia diabetica	30	20,41	33	22,76	63	19.81
Refraction anomalies	29	19,73	27	18,62	56	21,57
Cataracta	19	12,93	25	13,1	44	15,07
Retinopathia pigmentosa	19	12,93	21	13,1	40	13,7
Total	147	100	145	100	292	100

Pearson Chi-square = 4.1789, df = 7, p = 0.073872

Table 2. The structure of people with low vision according to age groups

Age groups	People with low vision	
	Number	%
20-30	11	3.77
31-40	15	5.14
41-50	33	11.3
51-60	79	27.05
> 60	154	52.74
Total	292	100

Table 3. Age structure of people with low vision according to etiology

Age groups	Glaucoma		Retinopathia diabetica		Refraction anomalies		Cataracta		Retinopathia pigmentosa	
	N	%	N	%	N	%	N	%	N	%
20-30	4	4.49	3	4.76	2	3.57	2	4.55	/	/
31-40	3	3.37	6	9.52	4	7.14	2	4.55	/	/
41-50	7	7.86	8	12.7	4	7.14	5	11.4	9	22.5
51-60	20	22.5	17	27	8	14.3	11	25	23	57.5
> 60	55	61.8	29	46	38	67.9	24	54.5	8	20
Total	89	100	63	100	56	100	44	100	40	100

Table 4. The structure of examinees according to their place of living

Gender		Place of living		Total
		Urban area	Rural area	
Males	Number	115	32	147
	%	78.23%	21.76%	
Females	Number	108	37	145
	%	74,48%	25.52%	
Total	Number	223	69	292
	%	76,37%	23.63%	100%

Pearson Chi-square =3.18485, df=1, p=0.0636572

Table 5. Working status of the examinee

Working status		Gender		Total
		Males	Females	
Employed	Number	7	9	16
	%	4.76%	6.2%	5.48%
Unemployed	Number	35	42	77
	%	23.81%	28.96%	26.37%
Pensioners	Number	105	94	199
	%	71.43%	64.83%	68.15%
Total	Number	147	145	292
	%	50.34%	49.66%	100%

Pearson Chi-square =17.6660, df=3, p=0.004138

Table 6. Marital status of the examinees

Marital status		Gender		Total
		males	females	
Single	Number	52	49	101
	%	35.37%	33.8%	34.59%
Married	Number	95	96	191
	%	64.63%	66.2%	65.41%
Total	Number	147	145	292
	%	100%	100%	100%

Pearson Chi-square= 5.24943, df=2, p=0.06795

Table 7. The number of family members of the examinees

Group	N	Means	Standard deviation	Standard error	Median	Mini-mum	Maxi-mum
Male	147	3.764	1.824	0.145	4	1	10
Females	145	3.490	2.156	0.276	3	1	12
Total	292	3.661	1.956	0.118	4	1	12

Mann-Whitney U Test Z = 1.850678, p = 0.06553

Table 8. The structure of examinees according to housing conditions

Gender		housing conditions		Total
		under rent	own house	
Males	Number	9	138	147
	%	6.12%	93.88%	100%
Females	Number	7	138	145
	%	4.83%	95.17%	100%
Total	Number	16	276	292
	%	5.48%	94.52%	100%

Pearson Chi-square = 0.631474, df = 1, p = 0.0626817

according to gender is shown in Table 1.

Out of the total of 292 examined people, 147 (50.34%) were males, and 145 (49.66%) females. For p >0.05, a statistically significant difference did not exist among the people with low vision according to gender (Pearson Chi-square =4.1789, df=7, p=0.073872).

Of the people with low vision with glaucoma, 50 were males and 39 females; with refraction anomalies, 29 were males and 27 were females; with cataracta, 19 were males and 25 females; with diabetic retinopathy, 30 were males and 33 females; and with pigment retinopathy, 19 were males and 21 females.

In the studied people, their age group according to etiology was also analyzed (Tables 2 and 3).

Out of the total of 292 examined people, 79 (27.05%) were the age group 50-60, and 154 (52.74%) were over 60 years old, 33 people (11.3%) were of the age group 40-50, 15 people (5.14%) were of the age group 30-40, and 11 people (3.77%) were of 20-30 years of age.

There were 55 people (61.8%) with low vision with glaucoma with over 60 years of age; with refraction anomalies 38 (67.86%); with cataracta 24 (53.54%); with diabetic retinopathy 29 (46.03%); and with pigment retinopathy, 23 people (57.5%) were 50-60 years old.

The structure of the studied people according to their place of living is shown in Table 4.

Of 292 examinees, 223 (76.73%) lived in urban areas, whereas 69 (23.27%) lived in rural areas. There were 115 (78.23%) males living in urban areas and 32 (21.76%) in rural areas; there were 108 (74.48%) women living in urban areas and 37 (25.52%) in rural areas. For p >0.05, a statistically significant difference did not exist between genders according to the place of living (Pearson Chi-square = 3.18489, df = 1, p = 0.063672).

Working status of the examinees is shown in Table 5.

There were 16 employed people (5.48%), 77 (26.37%) were unemployed, and 199 (68.15 %) were pensioners. Of the male examinees, 7 (4.76%) were employed, 35 (23.81 %) were unemployed, and 105 (71.43%) were pensioners; of the female examinees, 9 (6.2%) were employed, 42 (28.96%) were unemployed, and 94 (64.83%) were pensioners. For p <0.05, a significant difference existed between the genders according to the working status (Pearson Chi-square =17.666, df=3, p=0.004138).

Marital status of the examinees is shown in Table 6.

Of 292 examined people, 191 (65.41%) were married, and 101 (34.59%) were single. Of males, 95 (64.63%) were married, and 52 (35.37%) were single; of females, 96 (66.2%) were married, and 49 (33.8%) single. For p >0.05, a significant difference did not exist between the genders according to the marital status (Pearson Chi-square =5.24943, df=2, p=0.06795).

The number of family members was also analyzed (Table 7).

With male examinees, the number of family members ranged from a minimum of one to a maximum of 10 members, with a mean of 3.76±1.82, whereas with females the number of family members was from a minimum of one member to a maximum of 12 members, with a mean of 3.49±2.76; 50% of males and females live with over 4, that is over 3 members in the family. For p >0.05, a significant difference did not exist between the genders according to the number of family members (Mann-Whitney U Test Z=1.850678, p=0.06553).

The analysis of the parameter of living conditions showed the following results (Table 8).

There were 276 people (94.52%) with adequate living conditions, whereas 16 (5.48%) had no adequate living conditions. There were 138 (93.88%) males with settled living conditions, whereas 9 (6.12%) did not settle their living conditions. There were 138 (95.17%) females with settled living conditions and 7 (4.83%) who did not settle their living conditions. For p >0.05, a statistical significance did not exist between the genders whether they lived in their own houses or under rent (Pearson Chi-square =0.631474, df=1, p=0.0626817).

Doctor/healthcare availability, the possibility to use healthcare and type of treatment of the examinees is shown in Table 9.

All 292 examinees had their doctor available and could use healthcare services. There were 208 (71.23%) treated conservatively and 84 (28.77%) surgically. For p <0.05, a statistically significant difference existed between the type of treatment of the examinees, with a large number of those treated conservatively (Pearson-Chi square =14.247, p=0.0112).

Of those with glaucoma, 68 (76.4%) were treated conservatively and 21 (23.6%) surgically; of those with refraction anomalies, 49 people (87.5%) were treated conservatively and 7 (12.5%) surgically, and with cataracta 3 people (6.82%) were treated conservatively and 41 people (93.18%) surgically; with diabetic retinopathy, 48 people (76.19%) were treated conservatively and 15 (23.8%) surgically; and of those with pigment retinopathy, 40 people (100%) were treated conservatively.

The period of evolution of damage to the vision to diagnosis, up to the onset of severe form of low vision according to etiology is shown in Table 10.

Of 292 examined people, in 12 (3.77%) a severe form of low vision occured in the period of 5-10 years, in 52 (17.8%) in the period of 10-15 years, in 93 (31.85%) in the period of 15-20 years, and in 135 (46.23%) in the period of over 20 years of diagnosis of ophthalmological diseases which caused damage to the vision.

Table 9. Type of treatment of people with low vision

Disease	Type of treatment					
	Conservative		Surgical		Total	
	Number	%	Number	%	Number	%
Glaucoma	68	76.4	21	23.6	89	100
Retinopathia diabetica	48	76.19	15	23.8	63	100
Refractive anomalies	49	87.5	7	12.5	56	100
Cataracta	3	6.82	41	93.18	44	100
Retinopathia pigmentosa	40	100	/	/	40	100

Pearson-Chi square = 14,247, p = 0,0112

Table 10. Evolution and duration of ophthlamological diseases

Disease	Period of evolution							
	0-10 years		10-15 years		15-20 years		> 20 years	
	Number	%	Number	%	Number	%	Number	%
Glaucoma	/	/	14	15.73	35	39.32	40	44.94
Retinopathia diabetica	/	/	3	4.76	20	31.75	40	63.49
Refractive anomalies	/	/	10	17.86	15	26.79	31	55.36
Cataracta	12	27.27	20	45.45	8	18.18	4	9.09
Retinopathia pigmentosa	/	/	5	12.5	15	37.5	20	50
Total	12	3.77	52	17.8	93	31.85	135	46.23

In the period when low vision occured, in a part of the examinees, in addition to the primary ophthalmological diseases which were a primary etiological reason for the damage to the vision, secondary ophthalmological diseases, complications, and additional cormobid states and diseases also played a great part.

Discussion

The total number of people with severely damaged vision in the world ranges from 110-180 million people, of which 35-45 million are blind (5-7).

The largest numbers of people with a severe form of damaged vision and blindness are registered in undeveloped geographical regions with poor health care system organization and low education, whereas the sociodemographic parameters of low vision predominated in people with low social and educational levels, poorly developed health system without any defined ophthalmic procedures for eye vision preservation (8, 9).

Recent studies around the world show some different aspects of impact of the social factors in the occurrence of low vision. The frequent severe weakening of vision and blindness are more prevalent in rural areas in comparison to urban areas, especially in Africa, Latin America, Asia, India, where there is a low level of health care and poor social standard (7, 10, 11).

Among the people with higher education, because of their scrupulous behaviour towards their health and care for their vision and because of the burden of reading and exposure to modern computer technology, refractional anomalies dominate as etiological causes of low vision, and with aging they are followed by other degenerative ophthalmological diseases (12, 13). In people with a lower education level, because of their inadequate behavior towards their health and untimely treatment of pathological states af-fecting their eyes, the prevalence of damaged vision is higher (14).

Gender as a demographic parameter is significant with some ophthlamological diseases, such as glaucoma, senile macular degeneration, pigment retinopathy and other. Among the types of glaucoma with an open angle, in both genders, males and females are equally affected, whereas with glaucoma with a closed angle, people of female gender predominate (15-17). Females are most frequently affected with senile macular degeneration and with pigment retinopathy, and individuals over the age of 50 years are at risk, especially those who consume more than 50 ml of alcohol a day (18-22). Prospective studies of cataract with many respondents performed in Ghana and India established most frequent occurrence of cataracta among females (23, 24).

Regarding age, according to the program of WHO 'The Right to Vision 2020', the number of people with low vision and blind people is progressively increasing with age - 31,7% with severe low vision and blind people are 45-59 years old and 58% are those over 60 years old (25, 26).

As the most frequent etiological reasons for the occurrence of severe low vision and blindness in West European countries and India, there are glaucoma, senile macular degeneration, diabetic retinopathy, refraction anomalies and hereditary-

congenital diseases, and in Netherlands, glaucoma and senile macular degeneration (3, 27).

In Netherlands, glaucoma, diabetic retinopathy and senile macular degeneration are the main causes of blindness and low vision in people over 55 years of age (28).

Further, 1-2% of the population is affected by glaucoma, mostly those over 40 years of age, in 20-30% of the affected a severe form of low vision and blindness develops, mostly in people over 60 years of age, dominated by open-angle glaucoma and in 5-6% of the total number, closed angle glaucoma (17, 29, 30).

Reference studies conducted by various authors in the world examining the evolution of visual impairment in persons with diabetes mellitus indicate that after 7-10 years after the onset of diabetes mellitus type 1, and 15-20 years after the onset of diabetes mellitus type 2, in 20% of the affected with type 1 and 50% affected by type 2 at the ages of 20-65 years, changes occur in the bottom of the eye in the form of diabetic retinopathy. After 25 years with type 1 diabetes, in 50% of the affected the disease progresses into a proliferative form, which within a period of 5-20 years after the diagnosis ends in severe low vision and blindness (20, 31, 32).

With pigment retinopathy, although the first symptoms of the disease in the form of hemeralopia may occur in childhood, pathognomonic clinical symptoms develop in the 2nd and 3rd decade of life and the disease most commonly at the age of 40-50 years ends in a severe form of low vision and blindness (33).

Although there are variations in the incidence of cataract related to gender, age and race in different regions of the world, cataract often appears in the 4th decade of life as a presenile form, and in people over 65 years of age it most commonly turns into a more or less severe protein denaturation, increasing the amount of water in the lens, which is the reason why it bulges, blurs, and this lowers the sharpness of vision; if adequate treatment is not administered in time, it can turn into a severe form of low vision and blindness, which at the same time can be the reason of unsuccessful surgical treatments (19, 20).

Conclusion

Social-demographic characteristics in the adult population with low vision, analysed by the parameters of gender, age, place of living, marital status, working status, housing conditions, number of family members and doctor availability and type of treatment, show that there is no statistical significance related to these parameters between the genders. The people most prone to low vision are those over 60 years of age and it does not represent a decisive handicap for socialisation compared to people with preserved vision, apart from employment and providing livelihoods. The results show a significance related to glaucoma, diabetic retinopathy and refraction anomalies, as predominating ophthlamological diseases which lead to a severe form of low vision.

The period from diagnosis up to the time when a severe form of low vision occurs is variable, long lasting and in a great number of cases in our study amounts to 15-20 years, which offers the opportunity for a successful prevention of blindness with timely diagnosis and treatment of these diseases.

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SOCIJALNO-DEMOGRAFSKI I KLINIČKI ASPEKTI SLABOVIDOSTI KOD ODRASLIH

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Slabovidost kod odraslih osoba ima multikauzalnu etiologiju, sprečava normalni tok i kvalitet života i adaptaciju slabovidih u društvo, zbog čega predstavlja na samo medicinski već i socijalni problem. Cilj rada bio je da sagleda značaj socijalnih i kliničkih karakteristika kod pojave, razvoja i ishoda slabovidosti odraslih obolelih od oftalmoloških oboljenja. Ispitivanjima su obuhvaćena 292 slabovida odrasla lica iz urbanih i ruralnih sredina, registrovanih u udruženjima slabovidih i slepih lica u Republici Makedoniji, obolelih od glaukoma, refrakcionih anomalija, dijabetične i pigmentne retinopatije i katarakte.

Analiza socijalno-demografskih parametara, pol, uzrast, mesto življenja, bračni status, radni status, stambeni uslovi, broj članova u porodici, dostupnost lekara i način lečenja ukazuju da ne postoji statistička značajnost u odnosu na ove parametre između lica muškog i ženskog pola. Najveća predisponiranost za slabovidost postoji kod osoba iznad 60 godina starosti i ona ne predstavlja odlučujući hendikep za socijalizaciju u odnosu na osobe sa očuvanim vidom, osim u delu zaposljenja i obezbeđivanja egzistencije. Glaukom, dijabetesna retinopatija, katarakta, refrakcione anomalije i pigmentna retinopatija u našem ispitivanju predstavljaju najčešća oftalmološka oboljenja, koja evoluiraju sa težim oblikom slabovidosti. Vremenski period od dijagnostikovanja, sve do nastajanja teže forme slabovidosti je varijabilan, dugotrajan i u najvećem broju slučajeva iznosi iznad 15-20 godina, što omogućava pravovremeno dijagnostikovanje i tretman ovih oboljenja i uspešnu prevenciju pojave slepoće. *Acta Medica Medianae 2017;56(3):17-24.*

Ključne reči: *socijalno-demografske karakteristike, oftalmoloska oboljenja, slabovidost*