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RESEARCH

CAUSES OF DISABILITY, LOW VISION AND BLINDNESS IN OLD AGE

ABSTRACT

Introduction: The purpose of this study was to evaluate the causes of disability, blindness and low vision according to ages in patients who applied to our hospital between January 2011 and December 2012 and had at least 40% disability.

Materials and Method: The files of the patients who had at least 40 % disability were analyzed retrospectively and divided into two groups according to age: less than 65 years (Group 1) and ≥65 years (Group 2). The data was evaluated and compared by using SPSS v.15 software.

Results: Two-thousand-eight-hundred and six patients with 40% or more disability were included in to this study. The most three frequent causes of disability according to medical specialty were belonged to psychiatry (16.5%), physical medicine and rehabilitation (15.9%) and ophthalmology (9.7%) in Group 1, and neurology (23.0%), ophthalmology (20.5%) and cardiology (14.4%) in Group 2. The frequencies of amblyopia, degenerative myopia, and hereditary retinal dystrophy in Group 1, and cataract, AMD and glaucoma in Group 2 were higher, respectively.

Conclusion: This study, which determines the frequency and epidemiology of disability, low vision and blindness in elderly patients in the region of Eastern Anatolia, especially in the neighborhood of the city of Erzurum, might give suggestions for possible preventions.

Key Words: Blindness; Vision, Low; Disability Evaluation.

ARAŞTIRMA

YAŞLILIK ÇAĞINDA ÖZÜRLÜLÜK, AZ GÖRME VE KÖRLÜK NEDENLERİ

ÖZ

Giriş: Bu çalışmanın amacı Ocak 2011 ve Aralık 2012 tarihleri arasında hastanemize özürlülük oranının belirlenmesi için başvuran, %40 ve üzeri özürlü kabul edilen hastaların yaşlarına uygun olarak özürlülük nedenlerini, az görme ve körlük nedenlerini araştırmaktı.

Gereç ve Yöntem: Özürlülük sıklığı en az %40 ve üzeri olan hastaların dosyaları geriye dönük incelendi. Hastalar 65 yaş altı (Grup 1) ile 65 yaş ve üzeri (Grup 2) olmak üzere iki gruba ayrıldı. Elde edilen veriler SPSS 15.0 programı kullanılarak karşılaştırılıp değerlendirildi.

Bulgular: Çalışmaya % 40 ve üzeri bir oranda özürlü olduğu belirlenen 2806 hasta dahil edildi. Grup 1'de bölümlere göre en sık görülen üç özürlülük sebebi psikiyatri (%16,5), fizik tedavi ve rehabilitasyon (%15,9), göz hastalıkları (%9,7) ile ilgiliydi. Grup 2'de ise en sık görülen üç özürlülük sebebi nöroloji (%23,0), göz hastalıkları (%20,5) ve kardiyoloji (%14,4) ile ilgiliydi. Grup 1'de ambliyopi, dejeneratif miyopi ve herediter retina hastalıkları; Grup 2'de ise katarakt, yaşa bağlı makula dejenerasyonu ve glokom daha sık idi.

Sonuç: Bu çalışma yaşlılık çağında Doğu Anadolu Bölgesinde özellikle Erzurum çevresinde özür nedenlerinin bölümlere göre dağılımını ve sık görülen az görme ve körlük nedenlerini saptayarak olası önlemlere ışık tutabilir.

Anahtar Sözcükler: Körlük; Az Görme; Özürlülük Değerlendirme.

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Introduction

The average expected life span for humans was 47 years at the beginning of the 20th century, while it had risen to 77.8 years by the beginning of the 21st century (1). Populations are increasingly aging in most of the industrialized countries. The high prevalence of chronic diseases during aging increases rates of morbidity and mortality (2). About 15% of the world's population is estimated to live with some form of disability (3). Reduced vision is a very important public health problem, since 161 million individuals were estimated to have reduced vision in the world, of whom about 37 million were blind (4).

An international, comprehensive classification system has been developed by the World Health Organization (WHO) to define health and health related conditions, and functionality and limits of humans, in a standard language and setting. This system, called the International Classification of Functioning, Disability and Health, has been used as a classification system in studies of disabled individuals. In general, a disability rate determined by a board including physicians specialized in related diseases such as internal medicine, ophthalmology, ear-nose-throat, general surgery, orthopedics, neurology, and psychiatry. These measures are used along with the Balthazar formula when identifying a total disability level of an individual (5).

In order to have a right to receive a benefit in Turkey, the disability level of the individual should be at least 40% and documented in details by an established reference hospital like ours. In this study, we aimed to identify the frequency and epidemiology of disability and ophthalmologic diseases that may cause decreases vision or blindness in the patients who had at least 40% disability according to our hospital records.

Materials and Method

The files of patients with at least 40% disability who had applied to the Health Board of the Erzurum Region Education and Research Hospital between January 2011 and December 2012 were included and analyzed retrospectively, following the approval of the Ethics Board of Erzurum Region Education and Research Hospital. The study was conducted in accordance with the Declaration of Helsinki. Age, gender, whole body functional disability rate, medical branch of disability, ophthalmologic functional disability rate, best corrected visual acuity (BCVA), anterior and posterior segment examinations of the patients were recorded.

The patients were evaluated for physical and psychological impairments and given a score of functional loss in a medical branch according to the severity of the disease. A total body disability rate (TBDR) was defined according the WHO criteria. The patients who had disability related to two or more medical branches were assigned a TBDR that was calculated by using the Baltazard formula. The patients who had 50% or greater TBDR with difficulty or inability to perform basic activities such as eating, dressing, bathing, using the toilet, or had problems with mobility or communication were assigned to have a major disability rate (MDR).

In addition, the best corrected visual acuity (BCVA) of the patients was classified according to the WHO criteria; low vision as 20/400 ≤BCVA<20/60 and blindness as BCVA<20/400. The patients were divided into two groups according to age: less than 65 years (Group 1) and ≥65 years (Group 2). The gathered data was evaluated by using SPSS v.15 software.

Results

The medical files of 2806 patients were included in to this study. The female/male ratio was 0.54 (640 female, 1180 male) and 1.53 (596 female, 333 male) in Group 1 and Group 2, respectively. The mean age of the patients was 32.6±18.9 years in Group 1 and 77.8±7.3 years in Group 2. The mean TBDR was 65.4±18.1 in Group 1 and 76.3±15.8 in Group 2. The mean MDR was 86.7±10.8 in Group 1 and 88.6±7.9 in Group 2 (Table 1). The most frequent disabilities according to medical specialty, in descending order, were belonged to psychiatry (16.5%), physical therapy and rehabilitation (15.9%), internal medicine (12.0%) and ophthalmology (9.7%) in Group 1, and neurology (23%) and ophthalmology (20.5%) in Group 2 (Table 2). The most frequent ophthalmologic disabilities were cataract (32.6%), AMD (24.1%) and glaucoma (10%) in the Group 2, and amblyopia (20.1%), degenerative myopia (13.9%) and hereditary retinal dystrophy (11,5%) in Group 2. The mean ophthalmologic disability rates were 90.0±0.0 for hereditary retinal dystrophy and 62.5±25.6 for glaucoma in the Group 2, and 79.5±12.6 for retinal detachment and 73.5±18.6 for hereditary retinal dystrophy in Group 1 (Table 3).

The causes of bilateral blindness in descending order were glaucoma, cataract, and AMD in Group 2, and hereditary retinal diseases, phthisis bulbi and degenerative myopia in Group 1. The causes of unilateral blindness were AMD, cataract and glaucoma in Group 2, and phthisis bulbi, optic

Table 1— Disability Rates According to Age Groups.

		Mean±Standard Deviation	Number of Individuals	Age±Standard Deviation
All patients	Total Body Disability Rate	69.2±18.1	2806	48.4±26.8
	Rate of patients with major disability	87.7±9.2	422	55.6±27.4
Group 1	Total Body Disability Rate	65.4±18.1	1822	32.5±18.9
	TBDR in patients with major disability	86.7±10.8	212	32.4±19.2
Group 2	Total Body Disability Rate	**76.3±15.8**	984	77.8±7.3
	TBDR in patients with major disability	88.6±7.9	210	79.1±6.8

Table 2— Degree of Disability According to the Medical Specialty.

Medical Specialty	All Patients	Group 1	Group 2
Internal Medicine	345 (12.3%)	220 (12.0%)	125 (12.7%)
Ophthalmology	379 (13.5%)	177 (9.7%)	202 (20.5%)
Physical Therapy and Rehabilitation	424 (15.1%)	291 (15.9%)	133 (13.5%)
Chest Diseases	155 (5.5%)	81 (4.4%)	74 (7.5%)
Cardiology	261 (9.3%)	119 (6.5%)	14 (14.4%)
Ear Nose and Throat Diseases	193 (6.8%)	143 (7.8%)	50 (5.1%)
Neurology	394 (14.0%)	167 (9.1%)	227 (23%)
Psychiatry	315 (11.2%)	301 (16.5%)	14 (1.4%)
Urology	31 (1.1%)	12 (0.6%)	16 (1.6%)

nerve diseases and cataract in Group 1. The causes of bilateral low vision were cataract, AMD and degenerative myopia in Group 2, and degenerative myopia, hereditary retinal diseases and amblyopia in Group 1. The causes of low vision in a single eye were AMD and cataract in Group 2 and amblyopia and degenerative myopia in Group 1 (Table 4).

Discussion

Although aging is a natural process, identification of age-related diseases due to the increased life expectancy nowadays is an important public health issue. According to the World Health Survey, around 785 million (15.6%) people older than 15 years live with a disability (3). There were 153 million people with low vision globally who were 50 or older age worldwide and 32 millions o them are blind. Pascolini et al reported 3000 blind people and 25500 low vision people per 1 million populations in Europe (6).

In a study conducted by the World Health Organization, it was found that cataract and refractive errors account for 7% of years lost due to disability; in low to middle income countries, cataracts and refractive errors are the second and fifth causes of years lost due to disability, respectively (7). Pascolini et al (6) had reviewed studies and concluded that globally uncorrected refractive errors were the most common cause of visual impairment and cataract was the second. On the other hand, cataract (51%) was the most common cause of blindness. In their study, the causes of blindness were cataract (51%), glaucoma (8%), AMD (5%), childhood blindness and corneal opacities (4%), uncorrected refractive errors and trachoma (3%), and diabetic retinopathy (1%). Ramke et al studied patients over 40 years of age and found that cataract was the most common cause of blindness (69.3% at 6/60). It was also found that the prevalence of poor vision (better eye presenting vision of 6/60 or better, but worse than 6/18) in the public was 13.6 percent and this was primarily due to refractive errors and cataract (8). Ceyhan et al, in their study of patients living around the city of Van (in the same region with Erzurum), determined the respective rates as maculopathy (13.9%), phthisis bulbi (12.0%), amblyopia (11.0%), optic nerve diseases (10.6%), myopic degeneration (9.6%), pathologies due to lenses (3.1%) and AMD (1.4%) (9). In this study, cataract was not included in the analysis since they are preventable and treatable disorders. The high frequency of maculopathy is a result of hereditary retinal diseases. On the

Table 3— Number of Individuals, Ophthalmologic Disability Rates and Percentages According to Groups and Diseases.

	Group 1		Group 2	
Disease	Number and Percentage of Individuals	Ophthalmologic Disability Rates Mean and Standard Deviation	Number and Percentage of Individuals	Ophthalmologic Disability Rates Mean and Standard Deviation
Cataract	32 (11.1%)	32 (11.1%)	32 (11.1%)	32 (11.1%)
AMD*	7 (2.4%)	7 (2.4%)	7 (2.4%)	7 (2.4%)
Ambliyopia	58 (20.1%)	58 (20.1%)	58 (20.1%)	58 (20.1%)
Degenerative Myopia	40 (13.9%)	40 (13.9%)	40 (13.9%)	40 (13.9%)
Glaucoma	16 (5.5%)	16 (5.5%)	16 (5.5%)	16 (5.5%)
Hereditary Retinal Dystrophy	33 (11.5%)	33 (11.5%)	33 (11.5%)	33 (11.5%)
Phthisis Bulbi, Evisceration, Enucleated	27 (9.3%)	27 (9.3%)	27 (9.3%)	27 (9.3%)
Diabetic Retinopathy	14 (4.9%)	14 (4.9%)	14 (4.9%)	14 (4.9%)
Optic Nerve Diseases	15 (5.2%)	15 (5.2%)	15 (5.2%)	15 (5.2%)
Acquired Diseases of Cornea	11 (3.8%)	11 (3.8%)	11 (3.8%)	11 (3.8%)
Retinal Detachment	14 (4.8%)	14 (4.8%)	14 (4.8%)	14 (4.8%)
Acquired Diseases of Retina	12 (4.1%)	12 (4.1%)	12 (4.1%)	12 (4.1%)
Hypertensive Retinopathy	3 (1.0%)	3 (1.0%)	3 (1.0%)	3 (1.0%)
Hereditary Corneal Dystrophy	3 (1.0%)	3 (1.0%)	3 (1.0%)	3 (1.0%)
Uveitis	3 (1.0%)	3 (1.0%)	3 (1.0%)	3 (1.0%)

*AMD: Age-related macular degeneration.

other hand, the high frequency of phthisis bulbi was attributed to the high frequency of ophthalmologic trauma and low rate of access to health services. Our study analyzed from an ophthalmologic point of view, in all age groups, the most frequently seen ophthalmologic diseases causing disabilities were, in descending order, cataract (23.7%), AMD (15.2%), amblyopia (11.6%), degenerative myopia (8.1%) and glaucoma (8.1%). Even after the exclusion of cataract and amblyopia from this study, AMD, degenerative myopia and glaucoma were seen more frequently. Glaucoma, cataract and AMD were seen at statistically significantly higher rates among individuals aged 65 or over ($p<0.001$). Degenerative myopia, hereditary retinal disease and amblyopia were seen more frequently in the patients under age 65 years, compared to patients 65 or older; the difference between the groups was statistically significant ($p=0.024$). Mean ophthalmologic disability rates were 90.0±0.0 and 62.5±25.6 for hereditary retinal dystrophy and glaucoma, respectively, among individuals aged 65 or over, while the rates were 79.5±12.6 and 73.5±18.6 for retinal detachment and hereditary retinal dystrophy among individuals under age 65. Expectancy of vision is extremely low in diseases involving the retina, and hence the optic disk and macula.

The main causes of bilateral blindness in our study were glaucoma (27.1%), cataract (16.9%) in Group 2. The causes of the high frequency of glaucoma might be due to delay in consulting an ophthalmologist for economic reasons, low socioeconomic level and high genetic inheritance due to marriages among close relatives. The high frequency of cataracts might be due to the unwillingness of patients to undergo cataract operations because of their systemic diseases, and the higher rate of disability support that they would obtain from the health board due to their cataracts.

The main reason for the high frequency of hereditary retinal diseases in patients Group 1 was retinitis pigmentosa. The incidence of retinitis pigmentosa might be high in the Eastern Anatolia Region due to marriages among close relatives. The high frequency of phthisis bulbi among individuals Group 1 old may be explained by the high prevalence of penetrating trauma. Similarly, in a Singapore study the most common cause of bilateral blindness (60.0%) was reported to be glaucoma (10). In the Barbados eye study (11), the most common causes of bilateral blindness were cataract (58.3%), glaucoma (14.3%), diabetic retinopathy (8.7%), optic atrophy (7.1%) and AMD (2.4%). Negrel et al reported the causes of blindness in their study of 8571 individuals in and

Table 4— Number of Individuals, Ophthalmologic Disability Rates and Percentages According to Groups and Diseases.

	Cause of Bilateral Blindness (VA<20/400)		Cause of Bilateral Low Vision (20/400≥VA<20/60)		Cause of Unilateral Blindness (VA<20/400)		Cause of Unilateral Low Vision (20/400≥VA<20/60)	
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
	n	n	n	n	n	n	n	n
	%	%	%	%	%	%	%	%
Cataract	5	22	4	23	8	15	4	19
	3.8	16.9	6.6	28	14.5	21.7	13.33	32.75
AMD	2	11	2	16	2	19	2	21
	1.52	8.52	3.3	19.5	3.6	27.5	6.66	36.2
Amblyopia	2	–	10	11	7	1	7	1
	1.52	–	16.6	13.4	12.7	1.45	23.3	1.72
Degenerative Myopia	16	10	14	12	4	–	6	4
	12.2	7.75	23.3	14.6	7.28	–	20	6.89
Glaucoma	15	35	2	6	5	13	3	2
	11.5	27.1	3.3	7.3	9.1	18.8	10	3.45
Hereditary Retinal	41	–	11	–	3	–	–	–
Dystrophy	31.3	–	18.3	–	5.45	–	–	–
Phthisis Bulbi, Evisseration,	23	8	–	–	12	7	–	–
Enucleated	17.5	6.2	–	–	21.8	10.1	–	–
Diabetic Retinopathy	–	2	–	6	1	2	4	4
	–	1.55	–	7.3	1.81	2.9	13.33	6.89
Optic Nerve Diseases	5	10	–	4	8	2	2	4
	3.8	7.75	–	4.8	14.5	2.9	6.66	6.89
Acquired Diseases of Cornea	2	5	4	3	3	6	2	1
	1.52	3.87	6.6	3.7	5.45	8.7	6.66	1.72
Retinal Detachment	14	9	2	–	1	3	–	–
	10.1	6.97	3.3	–	1.81	4.34	–	–
Acquired Diseases of Retina	5	2	11	1	1	1	–	2
	3.8	1.55	18.3	1.2	1.81	1.45	–	3.44
Uveitis	3	–	–	–	–	–	–	–
	2.3	–	–	–	–	–	–	–

*Low vision is defined as 20/400≤BCVA<20/60 and blindness as BCVA<20/400 according to the WHO criteria

around the city of Diyarbakir as cataract (50.0%), corneal diseases (15.0%), glaucoma (12.0%), phthisis bulbi (6.0%) and optic atrophy (6.0%), while the causes of low vision were cataract (52.0%), refractive errors (26.0%) and corneal diseases (6.5%) (12). The probable cause of the high incidence of cataract in both blind individuals and people with low vision may be attributed to the difficulties in reaching a physician for cataract surgery. In addition, the high frequency of corneal pathologies can be explained by the high incidence of trauma cases in the Southeast Anatolia Region.

Some studies performed in European countries and United States, where the life expectancy is high, the most common cause of low vision is AMD (13,14). The high incidence of optic nerve diseases in Group 1 was associated with multiple sclerosis in our study. In a study by Helena et al, in individuals between the ages of 65 and 84, causes of unilateral blindness were reported as AMD (57.0%), glaucoma (14.0%) and degenerative myopia (14.0%), while in individuals under 65 the causes were optic nerve diseases (29.0%), retinitis pigmentosa (29.0%) and glaucoma (14.0%) (15). Negrel et al reported the main causes of unilateral blindness, in descending order, as corneal opacity (37.0%), cataract (33.7%), phytisis bulbi (16.0%) and amblyopia (7%). In our study, however, the incidences of AMD and glaucoma were found to be high in Group 2, while the incidences of phytisis bulbi due to trauma and optic nerve diseases due to multiple sclerosis were high among individuals in Group 1.

The causes of bilateral low vision were cataract (28.0%), AMD (19.5%) and degenerative myopia (14.6%) in Group 2. The most common causes of low vision reported by the Bejing ophthalmologic study group were cataract (36.7%), degenerative myopia (32.7%), glaucoma (14.3%), corneal diseases (6.0%) and AMD (2.0%) (16). Cataract was the most common cause of low vision in both studies, while AMD was the most common cause in our study. This can be attributed to the high mean age of the elderly group in our study. Degenerative myopia (23.3%), hereditary retinal diseases (18.3%) and amblyopia (16.6%) caused low vision in Group 1. The incidence of degenerative myopia increases in Asian populations; hence it is reported to be high in the Bejing study (16).

The limitation of this study is that in some cases the medical records are incomplete and in each age group there are some diseases categories there are no patients.

In conclusion, the incidence of cataract, AMD and glaucoma increases after 65 years of age, while amblyopia, degenerative myopia and hereditary retinal diseases are seen more frequently in patients less than 65 years old. In general, the most common causes for blindness at 65 years and older are cataract, AMD and glaucoma, while for people under 65 years old they are phytisis bulbi, degenerative myopia and hereditary retinal diseases.

This study helps to identify the most common causes of ophthalmologic disabilities, low vision and blindness and hence may offer important background information for the prevention of those disorders.

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