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Causes Of Vision Impairment Among Adult Patients in Kerbala, Iraq

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Abstract

Background: Currently, there are at least 2.2 billion people worldwide with visual impairment, of whom at least 1 billion have preventable or untreated vision loss. The world faces major challenges in ophthalmology. This includes inequalities in the coverage and quality of prevention, treatment and rehabilitation services. shortage of qualified ophthalmologists; poor integration of eye care services into the health care system, among other problems; Therefore, we conduct this study.

Aim: To identify the causes of visual impairment in Kerbala province, Iraq with view to address the treatment and challenges may face during the action .

Methods: The study was a cross-sectional , 200 patients who attended the ophthalmology outpatient clinic in AL- Hussien Teaching hospital, Kerbala province, Iraq were enrolled, aged 20 and above. Data was collected by interviewing the patients and filling out the questionnaire from July 2019 until June 2020. In addition, we observed visual acuity measurement (VA), intraocular pressure (IOP), and ophthalmological examination of the patients

Results: The main leading cause was a refractive error with 99 individual (51.3%) followed by cataract 26 (13.5%). Refractive errors and cataract together were 24 (12.4%), allergy 14 (7.3), infection 12 (6.2%), age-related macular degeneration 12 (6.23%) and lastly glaucoma was only 6 (3.1%).

According to the age group, 34 (17.6%) were between (17-39), followed by 102 (52.8%) between (40-59) and 57 (29.5%) between (60-89). In all these three groups RE was also the main diagnosis, 24 (70.6%) , 7 (55.9%) and 18 (31.6%) respectively. According to the smoking habit, 159 (82.4%) were nonsmoker, 14 (7.3%) were ex-smokers, 5 (2.6%) were light smokers (reported consumption of ≤5 cigarettes per day), moderate smokers (1 day for smoking 8 (4.1%) reported consuming 11 to 19 cigarettes per day) , heavy smokers (reported smoking more than 20 cigarettes per day) 7 (3.6%) .

As regards systemic disease, we found that 80 (41.5%) of patients have hypertension and 63 (32.6%) were diabetics.

Conclusions: We found that refractive errors were the most common cause of reduced visual acuity followed by cataracts. Cataracts are the most frequent cause of visual impairment in older people.

Keywords: refractive errors, Myopia, Hyperopia, cataract, vision impairment

1-Introduction

Visual acuity (VA) refers to clarity of vision, a measure of the eye's capability to see and discriminate fine details [1]. Visual impairment (VI), including blindness, is a major public health problem among middle-aged and older adults worldwide, and is associated with reduced quality of life and increased risk of falls and death [2] . Visual impairment in adults is a serious global social concern with health, social, psychological and economic aspects[1], impacting academic performance and future employment opportunities, which in turn affects individuals, It can affect family and community quality of life [1.[

The World Health Organization (WHO) estimates that there are approximately 285 million visually impaired people worldwide, 39 million of whom are blind, but most of them live in low-income regions . Blindness due to non-communicable eye diseases remains a major public health problem in Europe [1]. Uncorrected refractive errors account for approximately 79% of VI in the United States, and approximately 50% due to cataracts, which is the most familiar correctable eye disease [3.[

The prevalence of other ocular diseases such as presbyopia, cataracts, glaucoma and age-related macular degeneration increases sharply with age. Genetics play a role in the development of some eye diseases, such as glaucoma, refractive errors, and retinal degenerations such as retinitis pigmentosa [2.[

There are several modifiable risk factors that influence the development of various eye diseases, such as smoking and its influence on the development of age-related macular degeneration and cataracts [4]. Other factors include dietary, such as vitamin A deficiency, and environmental risk factors, such as hygiene, sanitation, and access to water [4]. In addition, using some drugs may predispose you to develop certain eye diseases. For example, long-term steroid use increases the risk of developing cataracts and glaucoma [4]. The causes of many ocular diseases are multifactorial, with many risk factors working together to increase both susceptibilities to disease and disease progression [4]. Behavioral Risk Factor Surveillance System (BRFSS) across age groups (similar to other disability categories), among women more than men, racial/ethnic minorities more than non-Hispanic whites and in low-income individuals were shown to be more common in [3[

Treatment of eye disease aims to cure the disease and control symptoms and progression. Treatment is also aimed at preventing or slowing the progression of vision loss [4]. Cataracts and refractive errors are the two main causes of vision loss. Treatment can treat vision problems and restore vision [2].

2. Methods: This study was conducted in the ophthalmology outpatient clinic at Al-Hussain Teaching Hospital In Kerbala province, Iraq from July 2019 till June 2020.

This study aimed to identify the causes of visual impairment in people who were attending the ophthalmological clinic. The study was a cross-sectional; two hundred patients aged 20 and above were enrolled.

A questionnaire format was designed which included the patient's name, age, gender, and history of the previous disease. Data was collected by interviewing the patients and filling out the questionnaire. Also, we observed visual acuity measurement (VA), intraocular pressure (IOP), and ophthalmoscopic examination which was performed by the ophthalmologist.

Visual acuity was measured using a Snellen chart at a distance of twenty feet (six meters). VA or VA is not corrected for the originally measured diopter of each eye [5].

We defined sight impairment as visual acuity less than 6/18 based on criteria established by the World Health Organization [6]. The average spherical equivalent refraction error is used in the calculation. Myopia is defined as a spherical equivalent ≥-0.50 Diopter (D). Hyperopia is defined as a spherical equivalent of +0.50 diopter or greater. Data were collected and analyzed using SPSS for Windows 2010. Tables and graphs were edited in Word 2010.

3. Results

One hundred ninety-three questionnaires were completed giving a response of 100 percent. There were 87 males (45.1%) and 106 females (54.9%). 100% were found to have a visual impairment; None of the cases had bilateral normal eyes, nor had unilateral or bilateral blindness. The severity of the impairment varies from mild, to moderate to severe.

According to smoking habits, 159 (82.4%) were non-smokers, 14 (7.3%) were former smokers, 5 (2.6%) were light smokers (reported consumption of five cigarettes or less per day), moderate smokers (reported consumption of 11 to 19 cigarettes per day) 8 (4.1%), heavy smokers (reported consumption of 20 or more cigarettes per day) 7 (3.6%).

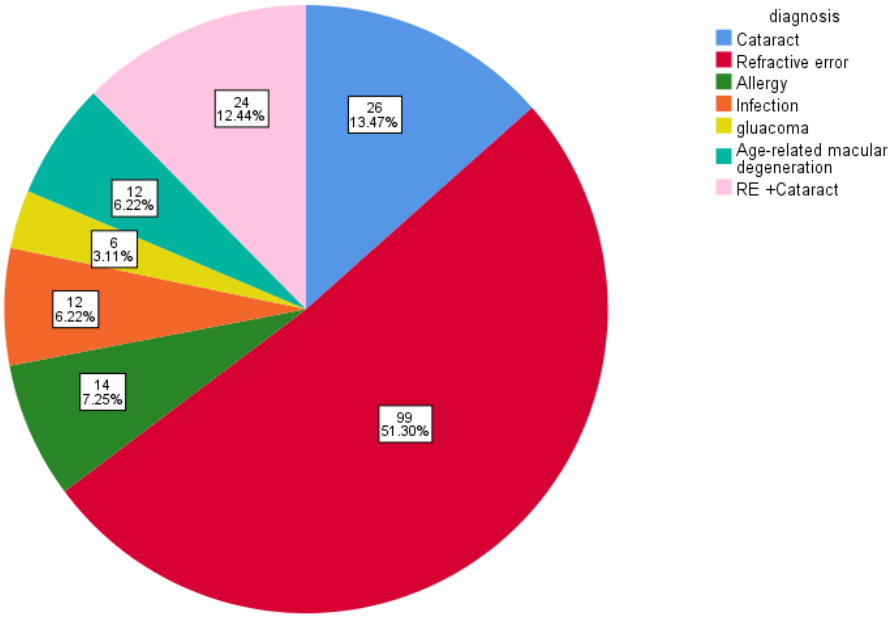
As regards systemic disease, we found that 80 (41.5%) of patients have hypertension and 63 (32.6%) were diabetics (55.4%) of patients taking drugs. Of patients who had trauma to one eye or both eyes only 14 (7.3%), 45 (23.3%) with previous operations, and lastly only 16 (8.3%) of patients have a family history of vision impairment.

TABLE 1: CHARACTERISTIC OF THE VISION IMPAIRMENT PATIENTS

VARIABLES		FREQUENCY	PERCENT %
GENDER	MALE	87	45.1%
	FEMALE	106	54.9%
AGE	17-39y	34	17.6%
	40-59y	102	52.8%
	60-89y	57	29.5%
DIAGNOSIS OF VISION IMPAIRMENT	Cataract	26	13.5%
	Refractive error	99	51.3%
	Allergy	14	7.3%
	Infection	12	6.2%
	Glaucoma	6	3.1%
	Age related macular degeneration	12	6.2%
	RE +Cataract	24	12.4%
SMOKING HABIT	Not smoker	159	82.4%
	Ex smoker	14	7.3%
	Light smoker	5	2.6%
	Moderate smoker	8	4.1%
	Heavy smoker	7	3.6%
HYPERTENSION	YES	80	41.5%
	NO	113	58.5%
DIABETES MELLITUS	YES	63	32.6%
	NO	130	67.4%
DRUG HISTORY	YES	107	55.4%
	NO	86	44.6%
TRAUMA	YES	14	7.3%
	NO	179	92.7%
PREVIOUS OPERATION	YES	45	23.3%
	NO	148	76.7%
FAMILY HISTORY	YES	16	8.3%
	NO	177	91.7%

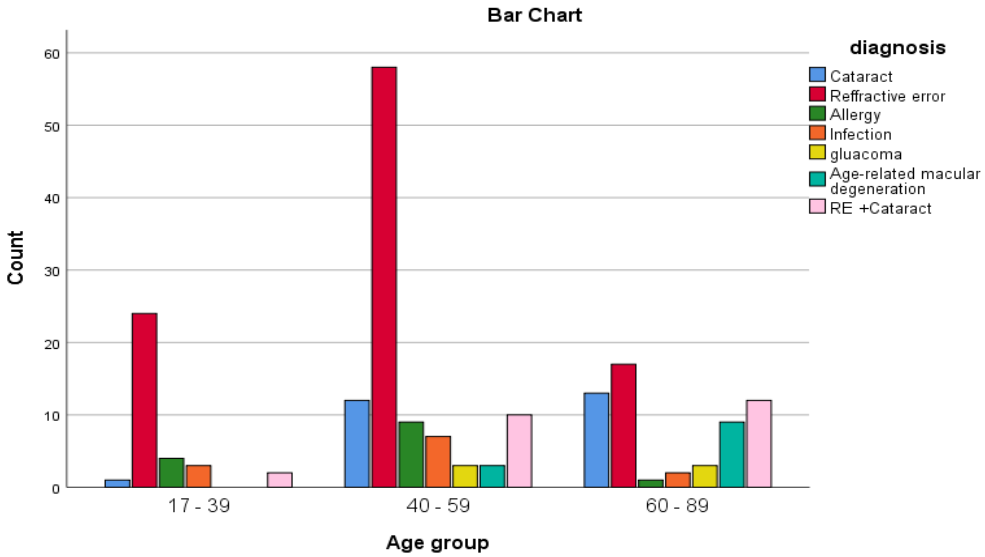
The main cause of visual impairment was a refractive error with 99 (51.3%) followed by cataracts at 26 (13.5). RE and cataract together contributed 24 (12.4%), allergy 14 (7.3), infection 12 (6.2%), age-related macular degeneration 12 (6.23%) and lastly glaucoma was only 6 (3.1%).

Figure 1: Displays the diagnostic distribution of visual impairment.



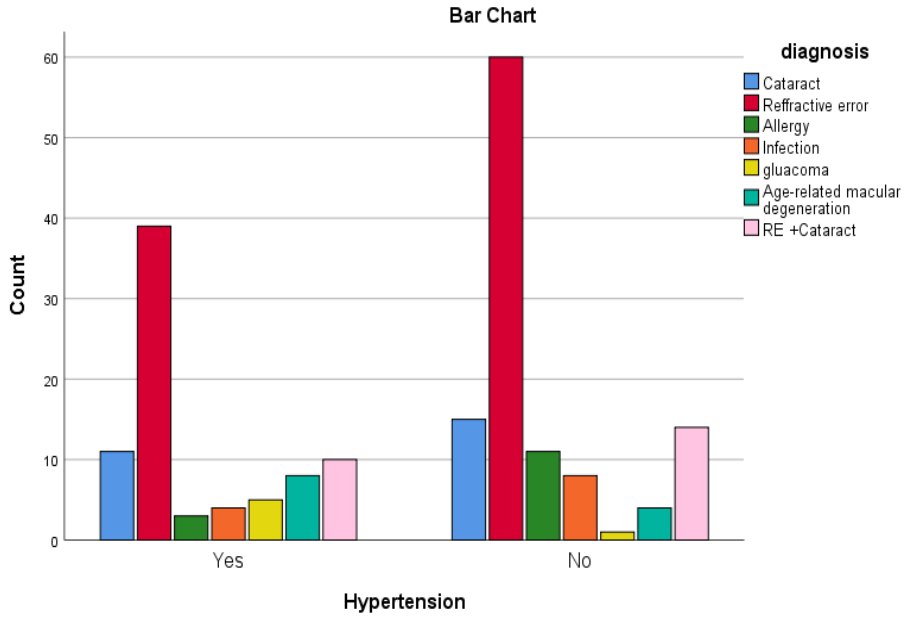
According to the age group, 34 (17.6%) were between (17-39), followed by 102 (52.8%) between (40-59) and 57 (29.5%) between (60-89). In all these three groups refractive error (RE) was also the main diagnosis, with 24 (70.6%) in the first group followed by 7 (55.9%) in the second group and 18 (31.6%) in the third. The right eye was normal (6/6) in 45 (23.3%) while the left eye was 42 (21.8%) of all age groups.

Figure 2: Distribution of age groups according to diagnosis of visually impaired patients



In hypertensive patients, we found that the most common causes of visual disturbances were refractive errors and cataract. In addition, the rates of glaucoma and age-related macular degeneration had increased.

Figure 3: Distribution of diagnosis according to the history of hypertension of visually impaired patients



1. THE RELATION BETWEEN VARIABLES WITH GENDER BY CHI-SQUARE TEST

The association between the gender , age ,diagnosis of vision impairment , smoking habits ,hypertension ,diabetes mellitus ,drug history, trauma ,previous operation ,and family history of vision impairment

- Chi –square test was performed to examine the association between the gender and these variables
- The relation between gender and smoking habits, hypertension , previous operation was significant ($p\_value \leq 0.05$) ranging from the strongest (smoking habits) fisher's exact test = 18.169 to the minimum relation with (previous operation) chi –square = 5.278
- While it showed that there was no significant association between gender and the age, diagnosis, diabetes mellitus, drug history, trauma, family history. ($p\_value \geq 0.05$)

TABLE. 2.THE Chi-Square Test

VARIABLE		MALE		FEMALE		STATISTICAL TEST	P_value
		N	%	N	%		
AGE GROUP	17-39y	15	17.2%	19	17.9%	X^2=2.989 df =2	**0.243**
	40-59y	41	47.1%	61	57.5%		
	60-89y	31	35.6%	26	24.5%		
DIAGNOSIS OF VISION IMPAIRMENT	Cataract	12	13.8%	14	13.2%	Fisher's Exact Test =6.753 df=6	**0.344**
	Refractive error	39	44.8%	60	56.6%		
	Allergy	5	5.7%	9	8.5%		
	Infection	5	5.7%	7	6.6%		
	Glaucoma	4	4.6%	2	1.9%		
	Age-related macular degeneration	7	8%	5	4.7%		
	RA +Cataract	25	17.2%	9	8.5%		
SMOKING-HABIT	Non-smoker	62	71.3%	97	91.5%	Fisher's Exact Test =18.169 Df = 4	**<0.001**
	Ex-smoker	8	9.2%	6	5.7%		
	Light smoker	3	3.4%	2	1.9%		
	Moderate smoker	7	8%	1	0.9%		
	Heavy smoker	7	8%	0	0%		
HYPERTENSION	YES	27	31%	53	50%	X^2 = 7.082 Df =1	**0.009**
	NO	60	69%	53	50%		
DIABETES MELLITUS	YES	32	36.8%	31	29.2%	X^2= 1.234 Df=1	**0.284**
	NO	55	63.2%	75	70.8%		
DRUG HISTORY	YES	47	54%	60	43.4%	X^2 =0.129 Df=1	**0.772**
	NO	40	46%	46	56.6%		
TRAUMA	YES	7	8%	7	6.6%	X^2 = 0.148 DF=1	**0.784**
	NO	80	92%	99	93.4%		
PREVIOUS OPERATION	YES	27	31%	18	17%	X^2= 5.278 Df=1	**0.026**
	NO	60	69%	88	83%		
FAMILY HISTORY	YES	6	6.9%	10	9.4%	X^2=0.405 Df=1	**0.606**
	NO	81	93.1%	96	90.6%		

2. THE CORRELATION BETWEEN VARIABLES WITH AGE BY RUNNING ANALYSES

The association between age with gender ,diagnosis of vision impairment , smoking habits ,hypertension ,diabetes mellitus ,drug history, trauma ,previous operation ,and family history of vision impairment patients.

- Running analyses was performed to examine the association between the age and these variables

- The relation between age and hypertension , diabetes mellitus ,drug history and diagnosis of visual impairment was significant ranging from the strongest (Hypertension) R = 0.390 to the minimum relation with (diagnosis of vision impairment) R = 0.255
- While it showed that there was a weak association with gender and smoking habit to moderate association between age and the previous operation, trauma, family history.

TABLE. 3 .The relationship between variables with age by running analyses(correlation)

VARIABLE		**Running analyses(correlation)**
DIAGNOSIS OF VISION IMPAIRMENT	Cataract	**R =0.255**
	Refractive error	
	Allergy	
	Infection	
	Glaucoma	
	Age-related macular degeneration	
	RA +Cataract	
GENDER	MALE / FEMALE	**R =0.039**
SMOKING-HABIT	Non-smoker	**R =0.085**
	Ex-smoker	
	Light smoker	
	Moderate smoker	
	Heavy smoker	
HYPERTENSION	YES	**R =0.390**
	NO	
DIABETES MELLITUS	YES	**R =0.311**
	NO	
DRUG HISTORY	YES	**R =0.384**
	NO	
TRAUMA	YES	**R =0.128**
	NO	
PREVIOUS OPERATION	YES	**R =0.217**
	NO	
FAMILY HISTORY	YES	**R =0.175**
	NO	

4. Discussion

Studies in Latin America, Central India, and East Asia have also shown that the majority of people with visual impairments are due to uncorrected refractive error (URE) [7].

Our findings were in agreement with those studies, we found that the predominant cause of vision impairment is URE followed by cataract .

URE was also the leading cause of moderate and severe visual impairment [MSVI] in all regions with the proportion ranging between 43.2% and 48.1%[7] .

The frequent cause of visual impairment in the elderly and the leading cause of blindness worldwide is cataract [8]. Cataract surgery is readily available, effective, and safe in the United States, greatly reducing the chance of blindness from cataracts in older people. The incidence of cataracts increases with age, with less than 5% in those under the age of 65, but about 50% in those over the age of 75 [8]. Exposure to UV light may contribute to the development of cataract formation [8]. Our study found 26 cases (13.5%) of cataracts, a secondary cause of visual impairment. Cataracts and ERUs together contributed to 55% of blindness and 77% of visual impairment in adults over the age of 50 in the United States in 2015 [9]. Preventable vision loss from cataracts (reversible with surgery) and refractive errors (reversible with corrective lenses) continues to cause most blindness and moderate to severe visual impairment in adults over the age of 50 [10]. . In our study, RE and cataracts contributed to her 24 cases (12.4%).

Females had a substantially higher risk of having visual impairment than men in Ecuador and Brazil [11]. These findings are similar to our research, there were 87 males (45.1%) and 106 females (54.9%). The rate of visual impairment was found to be higher with age [11]. Age-related cataracts (ARC) remain one of the leading causes of vision loss worldwide, especially in China, a developing country that accounts for one- one-fifth of the world's population. Blindness was also found to be more common in women [11]. These results are in agreement to those documented in other studies conducted in India and Nepal. [12]. According to this study's findings, patients older than 40 were 159 (82.3%) while patients between (17-39) were only 34(17.6%), so age has a crucial role in increasing vision impairment and vision loss among the elderly which has been considered a major healthcare problem[12]. Increasing age is one of the most commonly associated risk factor for visual impairment, adults age 70 and older more prone to VI in comparison to adults in their fifties [13].

The strong bond between smoking and visual impairment in individuals with age-related macular degeneration AMD, which is similar to the findings from the UK population [14]. After controlling the possible confounding factors, present smokers were double as likely to have vision-impairing AMD as non-smokers in a UK study; while for former smokers, the association was not significant [14]

The Blue Mountains Eye Study found that present smokers have more risk of developing polycythemia vera at a significantly earlier age. [14]. Smoking is also associated with accelerated cataract formation[14].

I n our research the majority of patients were nonsmokers, this may explain the possible cause of a few percent of AMD in this study.

Several studies have revealed the link between hypertension and the increment in the potential risk for developing age-related macular degeneration due to impairment in choroid circulation.[15]. The Beaver Dam Eye Study, showed that Elevated blood

pressure at baseline was not associated with age related macular degeneration in general but raised the 10 year risk in developing the condition .[15]. In this study, our results are consistent with the first study, as we found that most AMD patients had hypertension.

People with vision impairment reported a greater prevalence of chronic conditions such as diabetes compared to people without vision impairment. African-Americans are two times prone to be blind or visually impaired than non-Hispanic whites [16] because diabetes is so common in such ethnic group. Diabetic retinopathy is the main eye complications of diabetes that lead to blindness in working age Americans [17] In our study, we found that one third of the patients had diabetes.

We also found more than half our research population taking medications. More drugs are related to an increased risk of adverse drug reactions [18]. Clinicians should take in consideration the drug side effects rather than just the benefits or risks of individual drugs for specific conditions [18].

Family history has also been shown to have some association with cataracts [19]. A single major gene may account for 58% of the risk of developing cortical cataracts, and another major gene may be responsible for 35% of nuclear cataracts [19]. In fact, in our study, the family history of visually impaired people only accounted for 8.3%.

Most of the eye injuries in rural areas occurred at work, indicating prioritize research into workplace to update their strategies and policies to minimize eye injuries [20]. Eye health promoting programs has a vital role in increase the awareness about traumatic blindness in targeting groups with vision to eliminate this burden [20] . Also, By performing a safe and minimal invasive surgery like Endoscopic optic nerve decompression in patients with post-traumatic visual impairment [21]. It has been documented the severe mid-face trauma causes blindness and visual impairment [22] with 10.8% of them lost vision in one eye. The leading cause of such injuries is traffic accidents and gunshot wounds. The severe impact of this incidents likely result in significant damage to the eyeball leading to immediate and irreversible blindness [22]. In fact, in our study, trauma and family history did not play an important role in VI

5. Conclusion

According to our study, we found that the most common cause of vision loss is uncorrected refractive error followed by cataract. Cataracts are the most common cause of vision loss in the elderly

Age, female gender, smoking, hypertension and diabetes mellitus had a substantial effect in increasing the vision impairment.

There is a strong relation between smoking, high blood pressure and visual impairment in people with age-related macular degeneration [AMD].

6-Limitations

The design of our study has some limitations. First, the number of cases is just one hundred and ninety-three patients. Second, some of the devices used to check for hypertensive retinopathy and diabetic retinopathy (OCT) were not available at AL-Hussein Teaching Hospital, Karbala. Finally, we take no step to clarify the difference between Type | and Type || diabetes

7-Recommendation

We recommend a screening ophthalmological examination for early detection of refractive errors and following the patients up to ensure they get the right treatment.

We can reduce cataract burden by arranging surgery as it is available, effective and safe.

Increase the awareness about the significance of avoiding UV light exposure because it increases the progression of cataract formations.

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