Determine Magnetic of Visual Impairment Cussed by Corrected and Uncorrected Refractive Error

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Abstract

Visual impairment has a significant impact on the patient's life. It can affect the ability to read, watch TV, work, even while driving, performing daily activities and practicing normal life.

Aim of study: As people age, the number of patients with visual impairment increases. They also need to be properly diagnosed and improved by visual specialists, as well as to describe drug interaction and health care. Through these steps, vision can be improved in people with visual impairment.

We study 85 cases, including 44 males and 36 females, were collected from Ibn al-Haytham Hospital from November 2018 to March 2019.

From the results obtained we observed that 58% with no disease, 21% (had cataract disease), 3% (had retinal detachment), and 1% (squint) of the participants had improved vision after a pinhole. We noted that in 3% (n=80) of the study population, vision did not improve with the pinhole in their left eye which indicated that refractive correction would not be successful.

Keywords: *Visual impairment, Pin holl and Retinal detachment*.

تحديد المغناطيسية للضعف البصري الناتج عن الخطأ الانكساري المصحح وغير المصحح

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الخلاصة

لضـــعف البصـــر تأثير كبير على حياة المريض. يمكن أن يؤثر على القدرة على القراءة ومشـــاهدة التلفزيون والعمل ، حتى أثناء القيادة وأداء الأنشطة اليومية وممارسة الحياة الطبيعية.

الهدف من الدراســة: مع تقدم الناس في الســن ، يزداد عدد المرضــى الذين يعانون من ضــعف البصــر. كما يحتاجون أيضًـا إلى تشـخيصـهم وتحسـينهم بشـكل صـحيح من قبل المتخصـصـين البصـريين ، وكذلك لوصـف التفاعل الدوائي والرعاية الصحية. من خلال هذه الخطوات ، يمكن تحسين الرؤية لدى الأشخاص الذين يعانون من إعاقة بصرية.

قمنا بدراســة 85 حالة منها 44 ذكور و 36 اناث تم جمعها من مســتشــفى ابن الهيثم من نوفمبر 2018 حتى مارس 2019.

من النتائج التي تم الحصـول عليها ، لاحظنا أن 58 ٪ بدون مرض ، و 21 ٪ (يعانون من مرض السـاد) ، و 3 ٪ (لديهم انفصـــال في الشـــبكية) ، و 1 ٪ (حول الحول) من المشـــاركين لديهم تحســـن في الرؤية بعد ثقب. لاحظنا أنه في 3 ٪ (ن = 80) من مجتمع الدراسة ، لم تتحسن الرؤية مع الثقب في عينهم اليسرى مما يشير إلى أن التصحيح الانكساري لن يكون ناجحًا.

الكلمات المفتاحية: *ضعف البصر ، ثقب الدبوس وانفصال الشبكية.*

1-Introductoin

Visual impairment is defined as a functional limitation of the eyes or visual system and can manifest as reduced visual acuity(VA) or contrast sensitivity, visual field loss, photophobia, diplopia, visual distortion, visual perceptual difficulties. The National Eye Institute defines low vision more loosely, as a visual impairment not correctable by glasses, contact lenses, medication or surgery, that interferes with the ability to perform activities of daily living. [1].

The term includes both partial sight and blindness. This impairment refers to abnormality of the eyes, the optic nerve or the visual center for the brain resulting in

decreased VA [1]. Visually impaired adults are concerned with securing and maintaining employment, productivity, and independence, as well as maintaining a home and fulfilling family and social obligations. Older adults who have new visual impairments face a significant challenge at a time when they may also be experiencing other major life changes, such as general health limitations. Loss of independence and the ability to enjoy leisure activities are predominant concerns of the older adult with a visual impairment. [2]. The classification of visual impairment varies worldwide. [3] according the WHO classifies levels of visual impairment based on visual acuity and/or visual field (FOV)limitation, and defines blindness as profound impairment (this can refer to blindness of one eye or blindness of the individual). [4] The WHO definition of blindness specifies visual acuity less than 20/400 and/ or remaining visual field less than 10 degrees in the better seeing eye. Visual acuity of 6//18 to 6/60 (inclusive) is considered moderate visual impairment (low vision) [4].

The term "visual impairment" refers to a functional limitation of the eyes or visual system1 due to a disorder or disease that can result in a visual disability or a visual handicap. For example, macular degeneration can result in reduced visual acuity (an impairment in vision). A visual disability is a limitation of the ability of the individual (in this example, the inability to read small print), and a visual handicap refers to a limitation of personal and socioeconomic independence. Simply put, a visual impairment may be considered as vision inadequate for an individual's needs.

1-2 Epidemiology of Visual Impairment

1-2-1- Ocular Examination

Examination of the visually impaired patient generally includes all areas of a comprehensive adult or pediatric eye and vision examination, as the clinician deems necessary or appropriate, with additional evaluation to specifically assess the visual impairment and its impact on functioning.

The examination is conducted to determine the physical causes of the impairment and to quantify the remaining visual abilities for the purpose of determining a rehabilitation plan [5].The optometric examination of the patient with a visual impairment, which is tailored for each patient, depends not only on the disease process responsible for the visual impairment but also on the chronological and developmental age of the patient, the patient's specific visual abilities and identified needs, and the optometrist's clinical judgment. The examination may include, but is not limited to, the following procedures:

1-2-2-Visual Acuity (VA)

Measurement of visual acuity is one component of the evaluation that allows the optometrist to quantify the degree of high-contrast vision loss and, in many cases, clearly identifies the patient's visual impairment as it relates to the chief complaint. Measuring visual acuity also allows the clinician to: Monitor stability or progression of disease and changes in visual abilities as rehabilitation progresses.

• Assess eccentric viewing postures and skills.
• Assess scanning ability (for patients with restricted fields).
• Teach basic concepts and skills relevant to the rehabilitation process.

Furthermore, the results of visual acuity testing are the basis for determining initial magnification requirements and the potential for specific rehabilitation strategies. The methods of assessing distance and near visual acuity in visually impaired patients may be modified to address specific concerns [5].

1-2-3 Refraction

Uncorrected refractive error is a significant cause of reduced visual acuity. Even in the presence of ocular disease or a visual disorder, refraction and use of conventional spectacles can be beneficial. Conversely, it has been shown that in visually impaired patients, use of a pinhole is not a reliable predictor of acuity

improvement with refraction; refraction should be done even if there is no improvement on the pinhole test.

All visually impaired patients should undergo refraction to ensure optimal correction for best visual acuity and to determine the amount of magnification needed for certain tasks. The presence of uncorrected presbyopia or significant uncorrected refractive error could affect success with low vision devices, while the use of certain optical and electronic devices (e.g., stand magnifiers, closed-circuit television systems, computers) may require patients to accommodate or to use a multifocal correction [6]. When the correction of refractive error significantly improves visual acuity, or when it is subjectively appreciated, as may be the case with moderate to high amounts of cylinder correction, the refractive correction should be incorporated into spectacle-mounted optical devices [7].

3-1 Statistical study of the selected cases

Estimates of the prevalence of visual impairment caused by uncorrected refractive errors for people aged 14 years and over. Statistical study of the selected cases (80 case) was performed according to distribution of age, gender, and the relation between age, genetic disease, eye disease and distribution according to family history as the following tables and figures.

3-1-1 Distribution according to age and gender

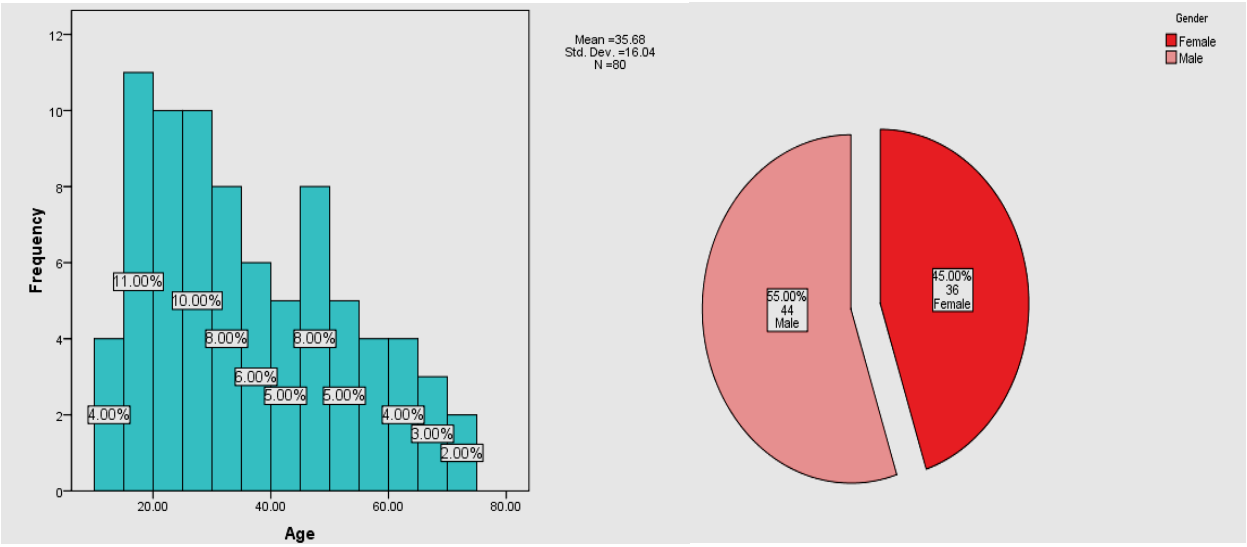

Fig. (3-1): Distribution according to age and gender

3-1-2- Relation between age and gender

Table (3-1): Relation between age and gender

		Gender			
No.	**Age**	**Male**	**Female**	**Percentage (%)**	
1	5-15	2	5	4.5	13.8
2	16-25	14	8	31.8	22.2
3	26-35	9	6	20.4	16.6
4	36-45	5	9	11.3	25
5	46-55	5	5	11.3	13.8
6	56-65	6	3	13.6	8.3
7	66-75	3	-	6.8	-

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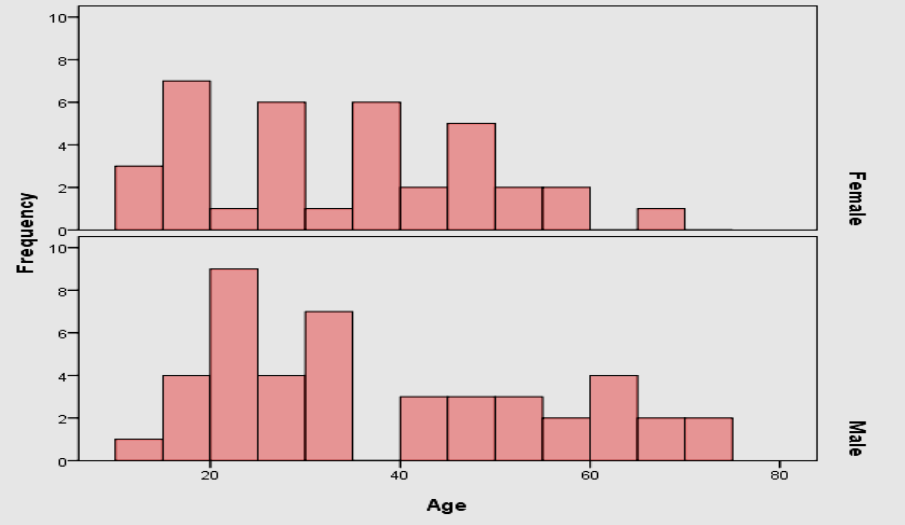

Fig. (3-2): Relation between age and genderfi

3-1-3 Relation between age with genetic disease

Table (3-2): Relation between age with genetic disease

No. of cases	Age	Genetic diseases	
		Yes	No
1	5-15	-	7
2	16-25	2	20
3	26-35	1	14
4	36-45	4	10
5	46-55	5	5
6	56-65	6	3
7	66-75	2	1

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Fig. (3-3): Relation between age and genetic disease

3-1-4 Distribution according to the age with eye diseases

Table (3-3): Relation between age and eye disease

No. of cases	Age	Eye diseases		
		Cataract	Retinal detachment	Squint
1	5-15	-	-	1
2	16-25	-	-	-
3	26-35	-	-	-
4	36-45	4	1	-
5	46-55	4	-	-
6	56-65	6	1	-
7	66-75	3	-	-

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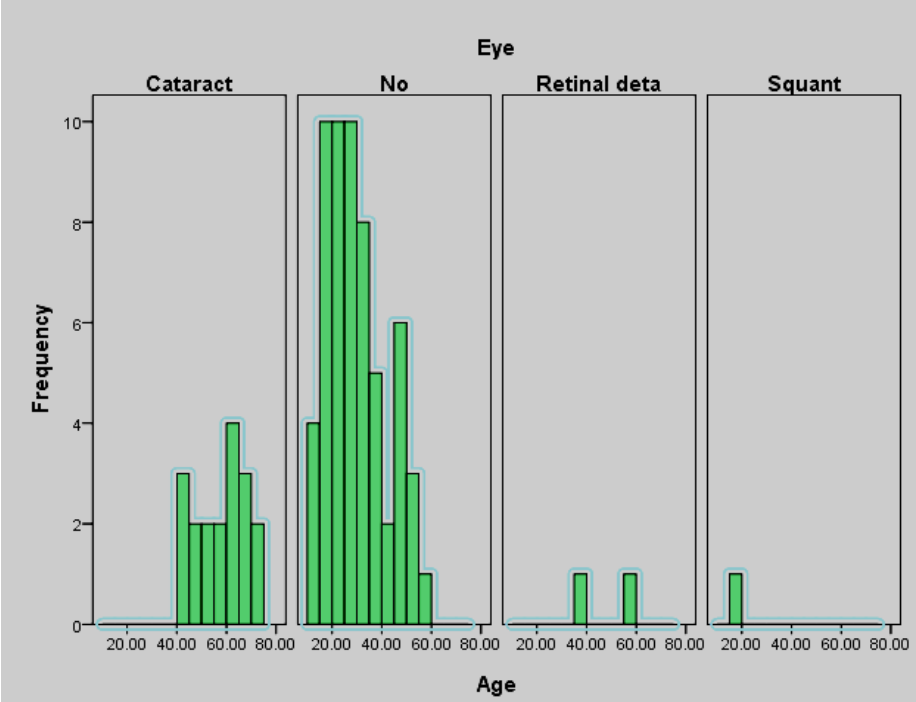

Fig. (3-4): Relation between age and eye disease

3-1-4 Distribution according to the family history

Table (3-4): Distribution according to the number of patients and family history

Number of patients	Family history (refractive error)		Percentage(%)	
	Yes	No	Yes	No
80	44	36	55	45

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3-1-5 Crosstabulation table between eye disease and visual acuity for right and left eye

Table (3-5): Cross tabulation table between eye disease and visual acuity for right eye

VAR * VAPR * Eye Crosstabulation

Count

Eye			VAPR							Total
			6/12	6/18	6/24	6/36	6/6	6/60	6/9	
Cataract	VAR	6/24	0	1	0	0	2		2	5
		6/36	0	0	1	0	1		1	3
		6/6	0	0	0	0	1		0	1
		6/60	1	0	0	1	1		1	4
		Cf5m	0	0	1	0	0		0	1
		Cf6m	1	0	0	0	0		2	3
	Total		2	1	2	1	5		6	17
N0	VAR	6/36					1			1
	Total						1			1
No	VAR	6/12	0	0	0	0	2	0	0	2
		6/18	0	0	0	0	16	0	0	16
		6/24	0	0	0	0	11	0	3	14
		6/36	0	0	1	0	6	0	4	11
		6/60	0	1	0	0	3	0	3	7
		6/9	0	0	0	0	2	0	0	2
		Cf2m	0	0	0	1	0	0	0	1
		Cf3m	0	0	0	0	0	1	0	1
		Cf4m	0	0	0	0	0	1	0	1
		Cf6m	1	0	0	0	1	0	1	3
	Total		1	1	1	1	41	2	11	58
Retinal deta	VAR	6/24					1			1
		6/9					1			1
	Total						2			2
Squant	VAR	Cf5m				1				1
	Total					1				1
cataract	VAR	6/18					1			1
	Total						1			1

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Table (3-6): Crosstabulation table between eye disease and visual acuity for left eye

Count

			VALP								
Eye			6/12	6/18	6/24	6/6	6/9	Cf2m	Cf3m	H.M	Total
Cataract	VAL	6/18	0	0		2	0			0	2
		6/24	0	0		1	1			0	2
		6/36	0	0		0	4			0	4
		6/6	0	0		1	0			0	1
		6/60	1	0		1	2			0	4
		6/9	0	0		1	0			0	1
		Cf4m	0	1		0	0			0	1
		Cf5m	0	0		0	1			0	1
		H.M	0	0		0	0			1	1
	Total		1	1		6	8			1	17
N0	VAL	6/24				1					1
	Total					1					1
No	VAL	6/18	0	0	0	17	0				17
		6/24	0	0	0	14	3				17
		6/36	0	0	0	4	6				10
		6/6	0	0	0	1	0				1
		6/60	1	1	0	2	2				6
		6/9	0	0	0	2	0				2
		Cf3m	1	0	0	0	0				1
		Cf6m	1	0	1	2	0				4
	Total		3	1	1	42	11				58
Retinal deta	VAL	Cf2m						1	0		1
		Cf3m						0	1		1
	Total							1	1		2
Squant	VAL	6/60		1							1
	Total			1							1
cataract	VAL	6/36				1					1
	Total					1					1

4-1- Discussion

The study enrolled 80 patient totally, all these cases from *Ibn al-Haytham Hospital* Age, gender, genetic and eye diseases of the participants were compared to their VA. We found out that there were no significant differences in VA according to the gender of the participants. The prevalence of the selected cases between 16-25 years old (table 3-1 and fig.3-2) without genetic disease (table 3-2, fig.3-3).

The sample consisted of 44 male and 36 female respectively. For both eyes before using pinhole assessment V.A results (6/6-C. F 6m) and (6/6-H.M) for right and left eyes respectively. While when pinhole assessment used V.A results (6/60-6/6) and (H.M-6/6) for right and left eyes respectively, though significantly important, there were differences in the improvement of VA in the left eye as compared with that of the right eye. We observed that 58% with no disease, 21% (had cataract disease), 3% (had retinal detachment), 1% (cataract) and 1% (squant) of the participants had improved vision after a pinhole assessment in both eyes (table 3-5 and 3-6). We noted that in 3% (n=80) of the study population, vision did not improve with the pinhole in their left eye which indicated that refractive correction would not be successful.

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