Prevalence of refractive errors of the eye among adults in Iraq

Adnan. A. Own, Fadia W. Alazawi[a], Ali H. ALI, Yasir A. Shakor, Shahad K. Rashid and Zainab H. Hasan[b]
Email- fadaiiraq@yahoo.com
07711176231

Abstract

Epidemiological studies indicated that uncorrected refractive errors are accounted to be among the important risk factors for visual impairments in the world for this reason this was chosen to achieve this study. This study was carried out in Ibn Al Haythim hospital in Iraq to estimate and determine the prevalence of the refractive errors (myopia, hypermetropia, and astigmatism) in Iraqi adults.

Introduction

The function of the eye is to see clearly the objects around us. The inability of the eye to accurately focus the rays of light coming from distance on the retina is called refractive error. This condition may be either because the eye is too short or long in length, or because the cornea or lens does not have the required refractive power. There are three types of refractive errors are as follows:

Myopia (near-sight): this is the condition in which the eye is too long and the light is focused in front of the retina. Distant objects are blurred but the near objects are seen clearly. The eye has too much optical power and to correct it the optical power is reduced by either minus glasses or contact lenses, or by surgery.
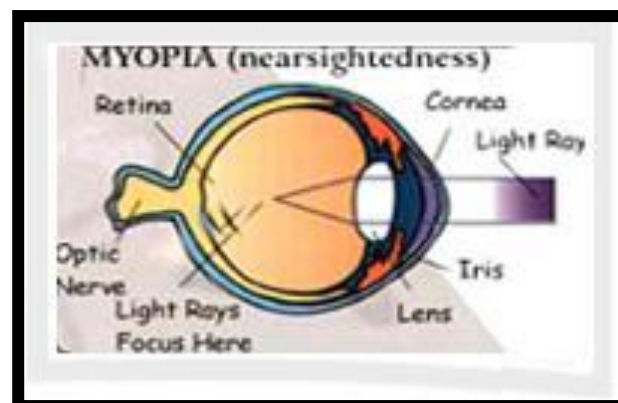

Figure (1): The light rays focus in front of the retina in the myopic eye

Hypermetropia (long-sight): this is the condition in which the eye is too short and the light is focused behind the retina. The eye has less optical power than is needed. When young the eye can use the lens within the eye to compensate, but reading glasses are needed at

a relatively early age. Later, distance glasses (plus) are needed as well, such that glasses for distance and near are required.
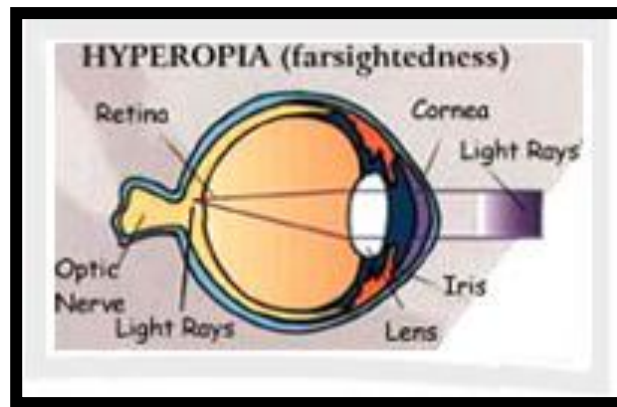

Figure (2): The light rays focus in front of the retina in the hypermetropic eye

Presbyopia: is the normal aging process, where the lens progressively loses its capacity to increase its power for near vision (loss of accommodation). The distance vision may be normal, but the near vision becomes blurred with age greater than about 45 years. This is corrected by wearing reading glasses (plus) for the near work. This condition may occur in itself or may be present alongwith pre-existing myopia, hypermetropia or astigmatism.

Astigmatism: this is the condition where the eye does not focus the light evenly, usually due to the cornea of the eye being more curved in one direction than the other. It may occur on its own or may be associated with myopia or hypermetropia.
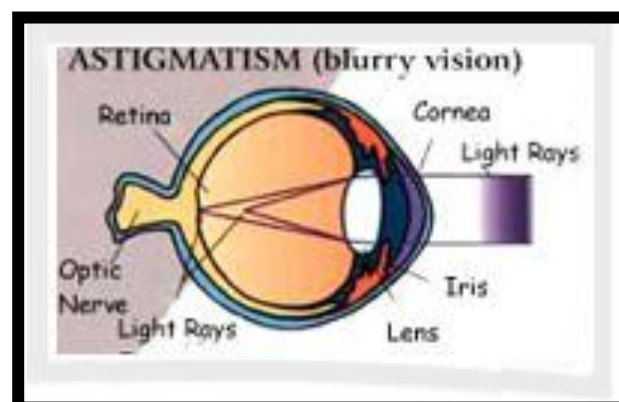

Figure (3): The light rays focus in front of the retina in the astigmatic eye

Materials & Methods

One hundred patients (200 eyes) were collected from Ibn-Alhaitham hospital. The frequencies of the patients according to sex as in the following table (1) and figure (4).

Table (1): Distribution of samples according to the sex.

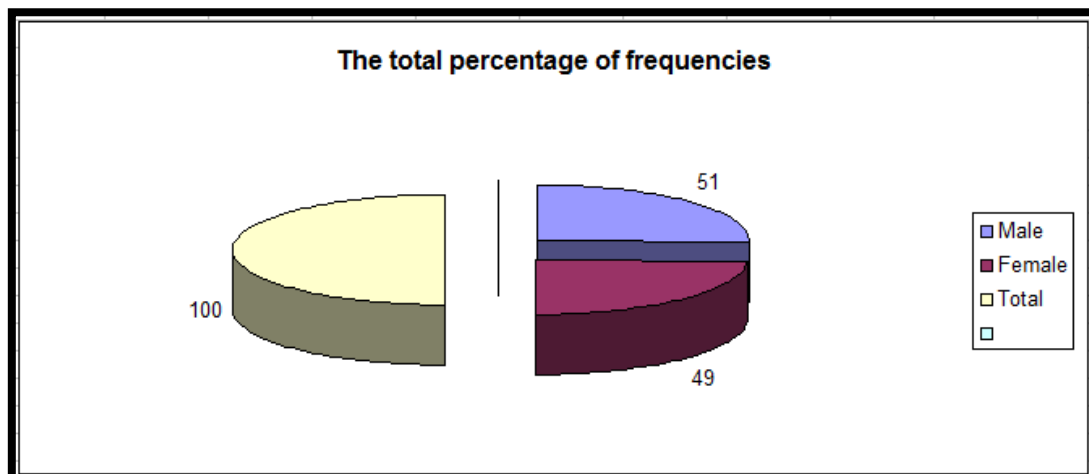| Sex	Frequency	Percentage %
Male	51	49
Female	49	51
Total	100	100

Figure (4): The total percentage of the frequencies for the selected cases.

Results & Discussion

Statistical study was achieved to estimate and determined the refractive errors in Iraqi adults as in the following figures and tables.

Table (2): The relation between sex and age

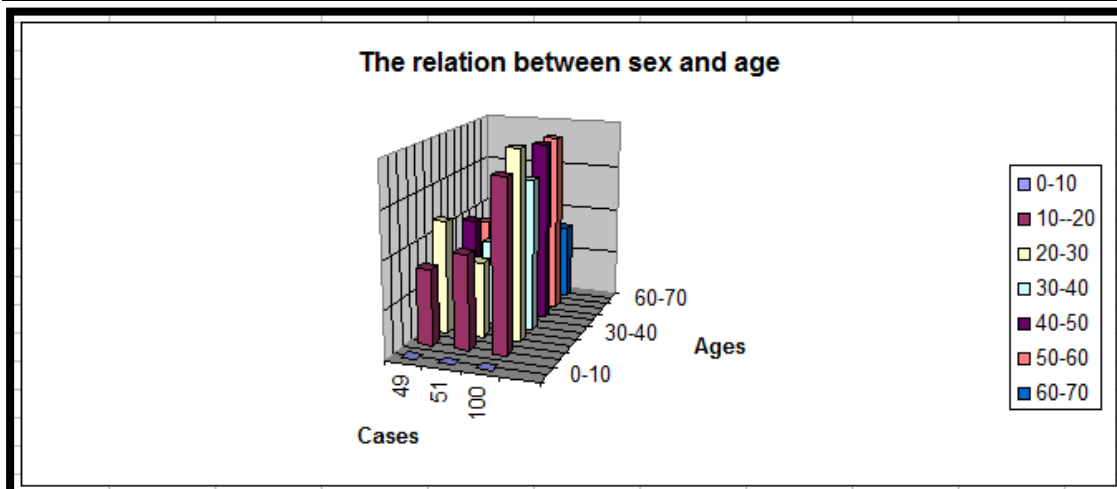| Sex	Ages							Total
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	
Female	0	8	12	7	10	9	3	49
Male	0	10	8	9	9	10	5	51
Total	0	18	20	16	19	19	8	100

Figure (5): The relation between sex and age

Table (3): The prevalence of the refractive errors according to age for the selected cases (Female)

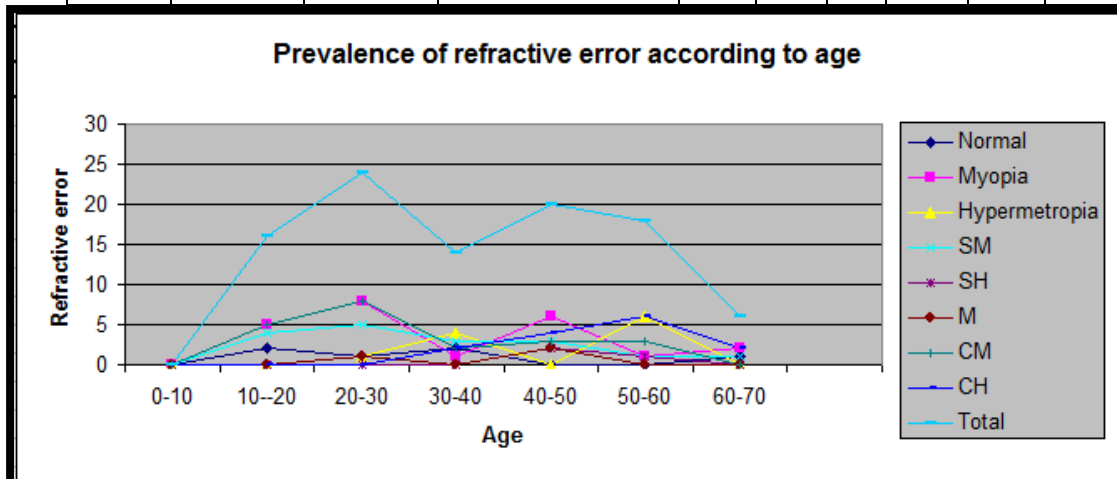| Age	Normal	Myopia	Hypermetropia	Astigmatism					Total
				SM	SH	M	CM	CH	
0-10	0	0	0	0	0	0	0	0	0
10-20	2	5	-	4	-	-	5	-	16
20-30	1	8	1	5	-	1	8	-	24
30-40	2	1	4	3	-	-	2	2	14
40-50	-	6	-	3	2	2	3	4	20
50-60	-	1	6	1	1	-	3	6	18
60-70	1	2	-	1	-	-	-	2	6

Figure (6): The prevalence of the refractive errors according to age for the selected cases (Female)

The spherical equivalent was calculated, the results for this calculations as shown in the following   tables   and   figures   for   females   and   males   respectively.

Table (4): SE cases number according to age for female.

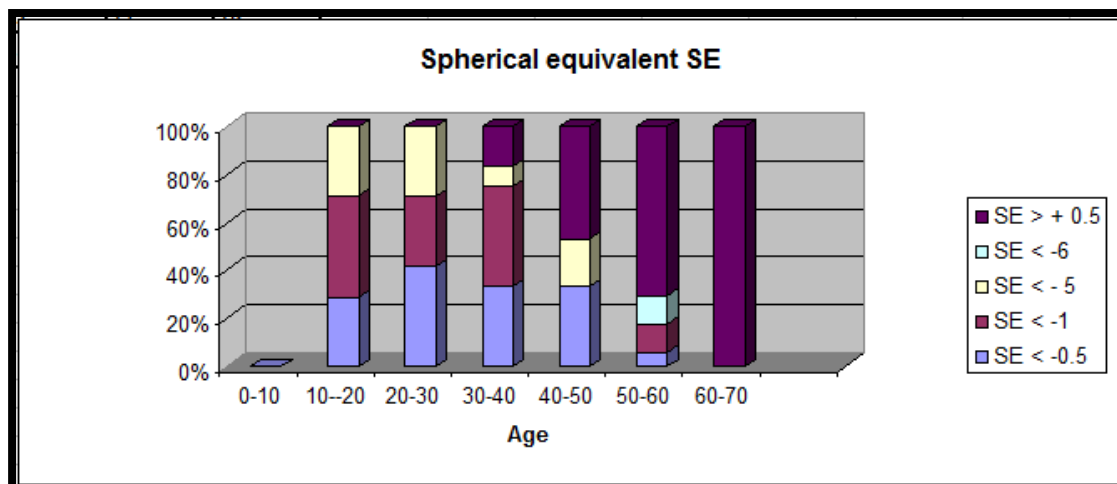| Age	SE < -0.5	SE < -1	SE < - 5	SE < -6	SE > + 0.5	n	N
0-10	0	0	0	0	0	0	0
10-20	4	6	4	-	-	14	16
20-30	10	7	7	-	-	24	24
30-40	4	5	1	-	2	12	14
40-50	5	-	3	-	7	15	20
50-60	1	2	-	2	12	17	18
60-70	-	-	-	-	4	4	6

Figure (7): SE cases number according to age for female.
Table (5): SE cases number according to age for male

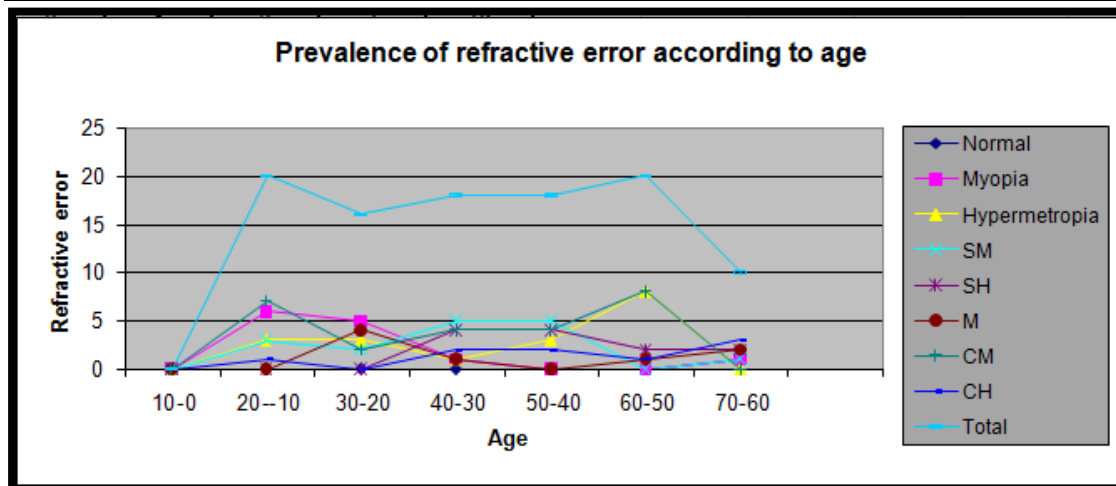| Age	Normal	Myopia	Hypermetropia	Astigmatism					Total
				SM	SH	M	CM	CH	
0-10	0	0	0	0	0	0	0	0	0
10-20	-	6	3	3	-	-	7	1	20
20-30	-	5	3	2	-	4	2	-	16
30-40	-	1	1	5	4	1	4	2	18
40-50	-	-	3	5	4	-	4	2	18
50-60	-	-	8	-	2	1	8	1	20
60-70	1	1	-	1	2	2	-	3	10

Figure (8): SE cases number according to age for male

Table (6): SE cases number according to age for male

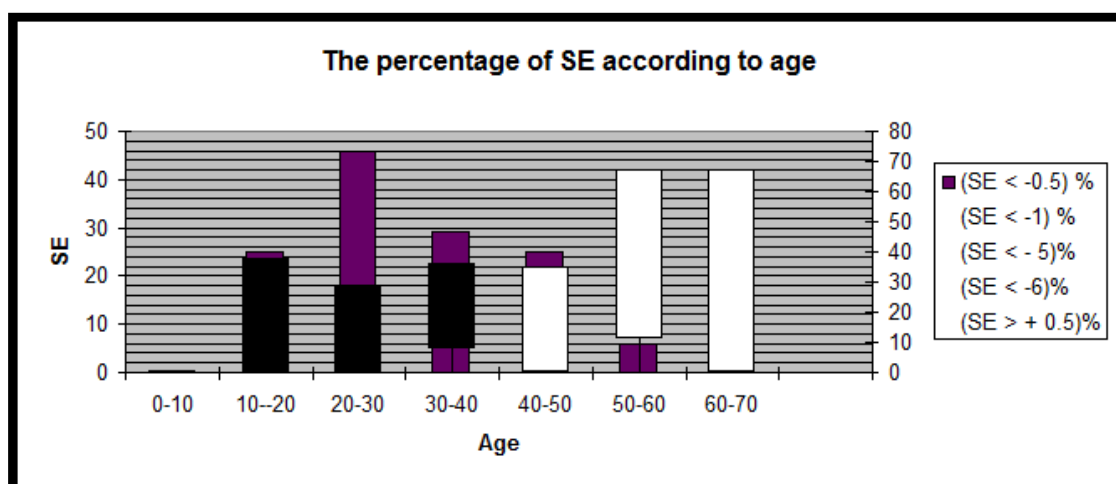| Age	SE < -0.5	SE < -1	SE < - 5	SE < -6	SE > + 0.5	n	N
0-10	0	0	0	0	0	0	0
10-20	2	3	11	-	4	20	20
20-30	2	6	4	-	-	2	14
30-40	1	4	3	2	1	11	18
40-50	2	1	6	-	4	13	18
50-60	2	4	4	-	12	22	22
60-70	-	1	1	-	4	6	10

Figure (9): SE cases number according to age for male

Table (7): SE cases number according to age for male

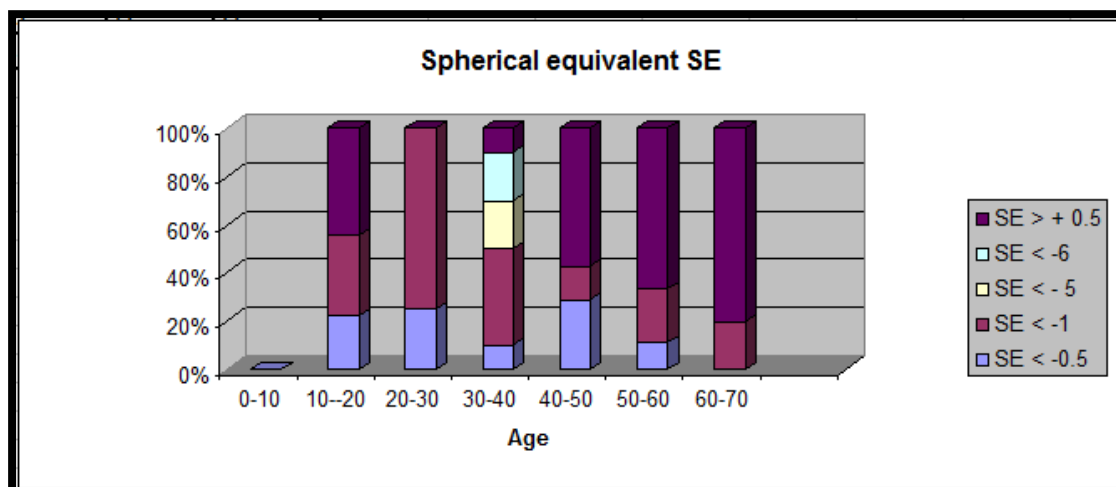| Age	(SE < -0.5) %	(SE < -1) %	(SE < - 5)%	(SE < -6)%	(SE > + 0.5)%
0-10	0	0	0	0	0
10-20	25	38	25	-	-
20-30	46	29	29	-	-
30-40	29	36	7	-	8
40-50	25	-	15	-	35
50-60	6	11	-	11	67
60-70	-	-	-	-	67

Figure (8): SE cases number according to age for male

Table (8): SE cases number according to age for male

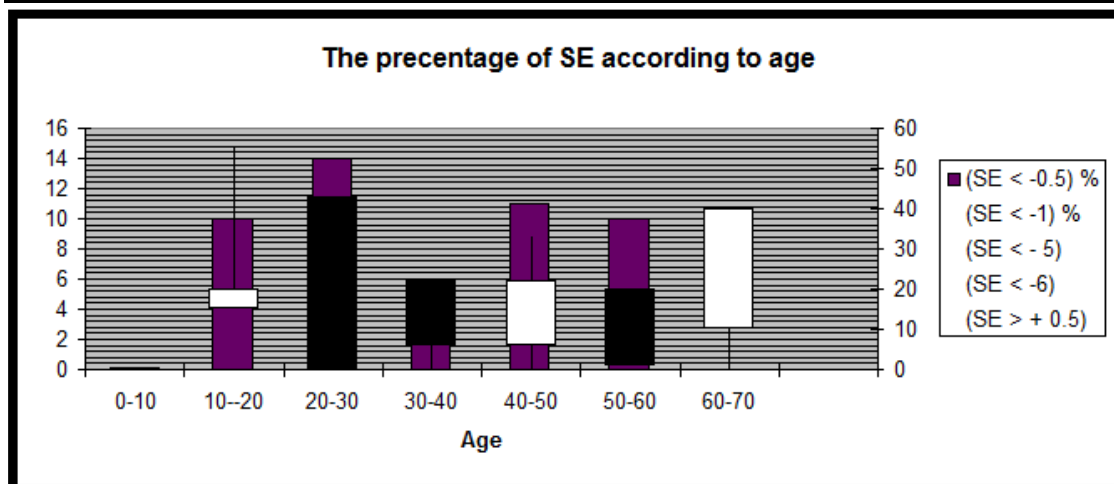| Age	(SE < -0.5) %	(SE < -1) %	(SE < - 5) %	(SE < -6) %	(SE > + 0.5) %
0-10	0	0	0	0	0
10-20	10	15	55		20
20-30	14	43	29	-	-
30-40	6	22	17	-	6
40-50	11	6	33	-	22
50-60	10	20	20	10	1
60-70	-	10	10	-	40

Figure (11): SE cases number according to age for male

Conclusion

Results obtained in this research led us to several important conclusions, including:

(1) Refractive errors were found more frequently in the males than females.

(2) The prevalence of each type of the refractive error (myopia, hypermetropia, and astigmatism) was increase with older patients. The results from the selected cases show that refractive error prevalence more in the period of age (40-50 and 50-60) which were 20 and 18 respectively.

(3) Myopia has more effect on peripheral refraction in adult eyes along the horizontal than along the vertical visual field. In particular, a peripheral myopic shift in *M* for emmetropes changes to relative hypermetropic shift in myopes for the horizontal visual field, but this change is not found for the vertical visual field. The differences in peripheral refraction between the two visual fields are consistent with what is known about the shapes of emmetropic and myopic eyes.

(4) Visual acuity after correction is better in patient who were wearing glasses before.

References

1. Dandona L, Dandona R. Estimation of global visual impairment due to uncorrected refractive error. Bull World Health Organ 2008; 86(8).

2. Bar-Sela, S.; Glovinsky, Y.; Wygnanski-Jaffe, T. & Spierer, A. (2009). The relationship between patient age and astigmatism magnitude after congenital cataract surgery. *Eur J Ophthalmol*, Vol. 19, No. 3 (March 2009), pp. 376–379.

3. Legras, R.; Chateau, N. & Charman, W. N. (2004). Assessment of just-noticeable differences for refractive errors and spherical aberration using visual simulation. *Optom Vis Sci,* Vol. 81, No. 9 (September 2004), pp. 718–728.