REFRACTIVE ERRORS, VISUAL IMPAIRMENT AND THE USE OF LOW VISION DEVICES FOR ALBINISM IN SOMALIA

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ABSTRACT

PURPOSE: *The objective of this study was to evaluate the most common type of refractive error in albinism patients and to find out the appropriate devices that they use.*

METHOD: *A cross sectional study was conducted on the albinism patients in Somalia from September 2021 till December 2021. All patients were aged between 7 to 45 years. Consent was taken from all the patients. Self designed proformas were filled online due to covid restrictions. Data was analyzed by SPSS 25.*

RESULTS: *A total of 68 forms were filled by the participants. The age groups was divided into 7-20 years (54%), 21-30years (40%) and 31-45(6%) years. The ratio of male and female was 68% and 32% respectively. Mainly hypermetropia (47%) and astigmatism (38%) were the refractive errors, 78% of the patients had refractive problem by birth. Among those, 99% were sensitive to sunlight. Most patients were using optical devices which are (75%) and non-optical devices was less used (18%).*

CONCLUSION: *Hypermetropia was the main refractive problem of albinism patients in Somalia. Most albinos preferred filtered spectacles and other optical devices over non-optical devices.*

KEY WORDS: *Refractive error, Visual impairment, Albinism, Low vision.*

INTRODUCTION

Refractive Error (Myopia, Hyperopia, and Astigmatism) is a common visual problem and it occurs when parallel rays of light are not focused on the retina. These errors affect huge number of world population regardless of age, sex and ethnicity.[1]

Myopia (the near sightedness) is a condition where the light comes from infinity does not reach to the sensitive layer of retina, being accommodation at rest. It is a worldwide medical condition leading to visual impairment and blindness complications.[2] Spectacles, contact lens are advised for its treatment and surgical correction of refractive error is become endorsed choice of treatment.

Hyperopia (the far sightedness) is a condition in which the rays come from infinity point focus behind the retina, which makes near object blur, while far object appears clear. Children with Hyperopia greater than +3.50 diopter have a risk of developing strabismus.[3]

Astigmatism is a condition of refractive error in which each meridian has different point of focus, the light rays going into the eye cannot be converge at the point of focus in the retina, and result in blurred vision due to dispersed focal lines. Common treatmentfor astigmatism is cylindrical spectacles.[4]

After visual pathway become faulty or some changes occur upon it then vision can be said impaiedr. In order to decide level of impaired

vision and blindness, an examining task of visual acuity is taken. The report of WHO expresses that VA greater than 6/18 is standard grades of vision, and 6/60 is referred as impaired vision, and 3/60 is severe) impaired vision.[5] Best visual acuity of stronger eye less than 3/60 is said to be blindness.[6]

Blindness because of refractive error can ruin education, character progression, and professional career, however causing a financial consequence on society. Despite that there are no data available on the economic loss as a result of blindness due refractive errors; it would not be unreasonable to assume that it is probably significant since a large proportion of those affected are in the economically productive age group.[7]

Continent of Africa has socio-demographic, socio-finance and geographical factors nevertheless survey expedition from Sub-Saharan African in indicated nation like western Africans and east Africans.[8] There is Co-relation between poverty and blindness and there is periodic link between them.[9]Albinism is a condition affects production of melanin, (pigment that colors skin, hair and eyes). It is a long-lasting condition, but it doesn't get worse over time. Individuals with albinism have a reduced amount of melanin, or no melanin at all. This can affect their vision.[10]

All kinds of ocular albinism, Ocular Albinism and Oculocutaneous Albinism, have comparable visual conditions, including different levels of congenital Nystagmus, reduced pigmentation of the retinal pigment epithelium, hypo pigmentation of iris leading to iris translucency foveae hypoplasia, reduced visual acuity usually in the range 20/60 to 20/400 and refractive errors, and sometimes a degree of color vision impairment.

Vision impairment is a key feature of all kinds of albinism. Eye problems may include sensitivity to the sunlight and extreme near or far sightedness. Nystagmus(the involuntary movements of the eye) is one of the common physical problems in albinism patients.[11]

Low vision aids enable people with low vision, such as albinos to join their everyday activities, enhance their residual visual function. Thereare mainly two types of low vision devices used for low vision people.[12]

The most common type is optical devices which are also used for distance and near vision. Telescopic devices are those devices which help for distance sometimes intermediate, while spectacle magnifiers, hand held magnifiers and stand magnifiers are used for near purpose. The second useful type of LVD devices is non- optical device which is cheaper than the optical ones and easily available for usage.[13]

As compare to other aids the reading glasses allow widest field of view for near reading. Hand held and stand magnifier used to magnify the near objects, providing the user to see small image and prints large. Various style and size of magnifiers are available for albinism.[14]

MATERIALS AND METHODS

A cross sectional study was conducted on the albinos in Somalia. All patients were between 7 to 45 years of age. Consent was taken from all the patients before the filling forms. The study was conducted from September to December

RESULTS

A total of 68 forms were filled by the participants. The age groups were divided into three groups (7-20 years (54%), 21-30years (40%) and 31-45(6%) years). The ratio of male and female was 68% and 32% respectively. Mainly hypermetropia (47%) and astigmatism (38%) were the refractive

errors (table 1), 78% of the patients had refractive problem by birth. Among those 99% were sensitive to sunlight. Most patients were using optical devices which were 75% and non-optical devices were18% (table 2).

TABLE 1: Response to questions 1 to 3 (n=68).

	Questions	Frequency	Percent
1.Type of refractive error	Myopia	10	14.70%
	Hyperopia	32	47.10%
	Astigmatism	26	38.20%
2. Onset of refractive error	By birth	53	77.90%
	With age	15	22.10%
3. Low vision device used	Optical	51	75.00%
	Non-optical	12	17.60%
	Both	5	7.40%

Table 2: Responses to questions 4 to 10 (n=68).

No	Questions:	Yes	No	Uncertain
1.	Are you satisfied with prescribed devices?	75.0%	10.3%	14.7%
2.	Is your vision improved with prescribed devices?	76.5%	11.8%	11.8%
3.	Comfortablein reading or writing with near devices?	57.4%	11.8%	30.9%
4.	Using distant devices for distance routine work?	54.4%	17.6%	27.9%
5.	Are you sensitive to the sun light?	98.5%	1.5%	
6.	Using filters for management of photophobia?	73.5%	10.3%	16.2%
7.	Do you face bad comments from the society?	63.2%	22.1%	14.7%

DISCUSSION

Albinism is an issue that influences people and both medically, socially and mentally. Epidemiological and general health information on albinism in Africa given this absence of information, a commonest range for everyone from 1/5,000 – 1/15,000 appears to be conceivable, showing that huge numbers of individuals in southern Africa are influenced.[15] Despite the fact that low in correlation with other significant medical issues, these figures and the considerably bigger quantities of by implication influenced people; qualify albinism as a general medical problem meriting further consideration.

In my study, 68 patients of Albinism coming from different regions of Somalia were addressed. All were having problems with their vision and required some aids which can help them to have better vision. their age groups were dived into three parts, the first group were between 7-20 years which is (54.4%) in the study and the second group were between 21-30 years (39.7%) and the third group were between 31-45 years which is the smallest number in the study (5.9%). The ratio of male was (68%) while 32% was female respectively. The most common type of refractive error in Albinism patient was hypermetropia which is (47%) and astigmatism was accounted (38%). 78% of patients had refractive problem by birth and rest (22%) had developed with the age. Among those patients, 99% were sensitive to sunlight. Most of the patients were using were using optical devices which is (75%) and non-optical devices were less used (18%). Facing bad comments from the community was one of the worst experience albinism patients seen.

In this study, 77.9% of the patients had developed refractive errors by birth and 22.1% of the patients had developed the refractive error with age. A descriptive cross sectional study was conducted in Nepal aimed to describe the visual functions in the OCA. Most of the eyes (n= 30, 60%) have developed the refractive error by birth. While, 34% of the patients had developmental myopia and 7% of the patients had developed with the rule astigmatism.[16]

Albino patients usually have visual impairment. According to present study, 75% of the albino patients were using optical low vision devices. 14.6% were using non-optical devices. 7.4% of the patients were those who were using both optical and non-optical low vision devices.

A study was conducted in Malawi to describe the refractive implications of albinism and use of low

vision devices by the OCA patients. One hundred and twenty albino subjects were examined, ranging in age from 4 to 25 years (median 12 years), 71% of the patients were using low vision devices and 31% of the total 71% were using optical low vision devices. 29% of the patients were using non-optical low vision devices.[17]

In current study, albino patients were evaluated whether they were satisfied with prescribed low vision devices or not. 75% of the patients responded that they were satisfied with the prescribed devices. 10.3% of the patients were not satisfied with the devices. 14.7% of the total evaluated population was not certain about the devices.

A retrospective study was performed of 15 pediatric patients with albinism for whom glasses and low vision devices had been prescribed to determine their satisfaction level about the devices in South Korea. The study showed that significant proportion of the population (70%) were surely satisfied with the devices they were using as they responded that their comfort level is increased with the devices which they had been prescribed. While 30% of the population expressed no satisfactory response towards the devices.[18]Most of the albinos patients frequently have complain of reduced comfort level while reading or studying. According to results of the present study, 57.4% of the patients can read or study comfortably with their respective devices. 11.8% do not feel comfort with their devices while performing educational tasks. 30.9% were not completely sure about the comfort level.

The main hindrance which they feel while looking at the distance targets or performing distance works because they can perform near tasks with hand held o stand magnifier easier than distance tasks while using telescopes because of their reduced visual fields. In the present study, 54.4% of the patients feel no trouble while performing distance work. 17.6% of the patients were not able to perform distance tasks easily. 27.9% were not sure about the ease or trouble they face while doing distance work.Albino patients are sensitive to sunlight because they are deficient of melanin in their iris. In this study, 98.5% of the patients were sensitive to sun light and only 1.5% of the patients responded that they are not sensitive to sunlight. To reduce this sensitivity, albino patients have to use glasses with tinted lenses and filters.

Photophobia is an abnormal intolerance to light and associated with a number of ophthalmicconditions.[19]Use of sunglasses and antireflective coating helps to reduce photophobia.[20] In this study 73.2% of the participants were using sunglasses or filter to reduce the photophobia. 10.3% responded that they did not use filters for management of photophobia.

Albino patients feel difficulty in communicating with other people. The fight against negative beliefs and attitudes towards albinism requires properly designed albinism awareness creation programme.[21] 63.2% of the patients responded that they face negative comments from the society. This study analyzes whether patients with albinism have benefit from refraction and whether low vision devices are helpful for albinism.

CONCLUSION

Hypermetropia was the main refractive problem of patients with albinism in Somalia. Most of them preferred filter spectacles alongwith optical devices over non-optical devices.

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