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Albinistic Refractive Challenges: a Case Study of People Living with Albinism Resident in Owerri Metropolis in Nigeria.

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ABSTRACT

The study which focused on the refractive errors associated with albinism sourced for biometric refractive status and visual acuity data of eighty albino individuals resident in Owerri metropolis who visited the Imo State University Optometry department clinics and some private owned eye clinics in the city. Observations and investigations made in the eleven month long study revealed that sixty seven of the individuals were oculocutaneous; ten were ocular, and three were albinoids. The subjects who were aged between eleven and sixty years exhibited varying degrees of refractive errors. Results showed that myopia was most prevalent '(78.75%), followed by the far distantly placed hyperopia with 11.25% incidence. Astigmatism (which could be associated with myopia or Hyperopia), posed a challenge to only 10% of the study population. The lowest myope was found to be -0.75 OS, while the highest was -5.25 OS. Similarly, the highest hyperope in the study was +3.50 DS, while the lowest was +0.75 Ds. The study also revealed that forty three members of the study population who were myopes had varying degrees of astigmatism as opposed to only four hypropes with identified varying degrees of astigmatism.

Keywords: Albinism, Refractive errors, Visual status.

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INTRODUCTION

Hair colour, skin colour and eye colour are among some physical parameters by which individuals can be identified. The genes account for physical traits as well as cellular chemical reaction which direct the production and direction of the body system[1] Every genetic information that may account for hair colour, skin or eye colour is contained in the deoxyribonucleic acid (DNA) and packed in specific structural unit called Chromosomes. As a matter of fact, most congenital abnormalities are as a result of what may be referred to as genetic miscoding: Any form of DNA mutation, chromosomal dysfunction or DNA deletion leads to congenital error of metabolism which often results in pathological consequences. Albinism is one of such genetically determined abnormalities in which the normal pigmentation of the body is disturbed. Albinism refers to a heterogeneous group of conditions having in common, a hereditary error of medium metabolism resulting in misrouting of optic nerve fibers during embryogenesis, underdevelopment of the neuroretinas and in varying degrees of hypopigmentation of the eyes, skin and hair [2] Melanin being the dark photo-protective pigment synthesized in the body is responsible for skin, hair and eye colouration: therefore, any hereditary disturbance of the blueprints coding for melanin synthesis and distribution leads to albinism. Albinism presents clinically as a pigmentation deficiency of the skin, hair and eyes. It has been shown that cutaneous and ocular melanin pigment can range from complete absence throughout the life time of the individual to the development of nearly normal levels including the ability to tan [3]. The visual symptoms of albinism include photophobia, varying degrees of nystagmus, reduction in visual acuity and varying moderate to high amount of corneal astigmatism [4.] Refractive errors are almost a persistent feature of albinism with myopia being the most prevalent and high degree of astigmatism [5]. Astigmatism in albinism is predominantly of corneal origin [6]. Refractive errors associated with albinism include myopia, hyperopia, or a combination of either with astigmatism. There are usually moderate to high refractive errors in the different types of albinism [7]. Near objects are often seen as blurred by persons with albinism. This is more pronounced in older children. But adults and aging people have been shown to have the capacity to overcome hyperopia by accommodation. This however, is aided by the use of glasses which tend to act in two ways by making the object to become clearer thereby allowing the individual to put in less effort to see clearly. In addition, the glasses enlarge the seen image.

MATERIALS AND METHOD

This work was designed to determine the prevalent refractive errors associated with albinism in

albino patients resident in Owerri metropolis in Nigeria. A sample population size of eighty (80) people living with albinism (both males and females) between the ages of eleven years and sixty years was used for the study conducted in the Optometry Department of Imo State University, Owerri and some private owned eye clinics in Owerri (Imo State Capital). Direct observations, examinations and tests of the subjects constituted the research instruments. The study population was drawn from primary schools, secondary schools and high institutions in the metropolis. Albino patients who visited the Imo State University Optometry clinic and some private owned eye clinics in the study areas to receive medical attention were also part of the part population. With the aid of the basic examination sheet, the case history, unaided distance acuity, aided distance visual acuity and unaided near visual acuity of the subjects were investigated. Furthermore, the subjects' aided near visual acuity, objective refraction and subjective refraction were also determined and for the purpose of thoroughness of investigation, the subjects' anterior and posterior segments were also examined. Objective refraction test was carried out on each subject to access objectively, the refractive state of the individual. The subjective refraction test followed the objective refraction investigation. For the purposes of accuracy and reliability of results of investigations, subjects presenting with multiple impairments or pathological impairments were excluded from the study.

RESULTS AND DISCUSSION

The eighty (80) subjects living with albinism used for the study comprised of both males and females with age range of eleven to sixty years. The age distribution of the subjects is shown in table 1

Table 1: Age Distribution of subjects

Age Range (years)	Frequency	Percentage(%)
11-20	25	31.25
21-30	22	27.50
31-40	19	23.75
41-50	9	11.25
51-60	5	6.25
Total	80	100

Table 2: Sex Distribution of subjects

Age Range (years)	Frequency	Percentage(%)
Males	49	61.25
Females	31	38.75
Total	80	100

Table 3: Distribution of subjects based on type of albinism suffered

Type	Frequency	Percentage (%)
Oculocutaneous Albinism	67	83.75
Ocular Albinism	10	12.50
Albinoidism	3	3.75
Total	80	100

Table 4: Distribution of refractive errors in subjects

Age Range (years)	Frequency	Percentage (%)
Myopia	63	78.75
Hyperopia	9	11.50
Astigmatism	8	10.00
Total	80	100

The refractive data of the eighty (80) subjects living with one form of albinism or the other were analyzed. Observations and investigations conducted on the subjects which comprised of forty nine (49) males and thirty one (31) females unveiled that there was no uniformity in the distribution of the three common types of albinism identified in the subjects, a result that was similar to the distribution of refractive errors among the subjects. Oculocutaneous albinism, ocular albinism, and albinoidism were all found to be associated with one type of refractive error or the other. For knowing sake, it is worth reporting that the majority (83.75%) of the individuals investigated for some common refractive errors associated with albinism suffered from oculocutaneous form of albinism. This was followed by a far distant placed ocular albinism suffered by only 12.50% of the subjects surveyed. As revealed by the study, the most prevalent refractive error associated with albinism among people living with the condition in Owerri metropolis was myopia a condition in which the visual images come to a focus in front of the retina of the eye resulting especially in defective vision of distant objects. About 79 percent of the subjects suffered from the defect. The second refractive error identified was hyperopia (also called farsightedness), a condition characterized by the visual images coming to a focus behind the retina of the eye and vision is better for distant than far near objects. Only 11.5 percent of the subjects investigated had hyperopia. A relatively lower percentage (10.0%) of the population studied suffered a defect of vision called astigmatism, a condition in which rays from a point fail to meet in focal point resulting in a blurred and imperfect image. From the findings of the investigations made, not less than forty three (43) subjects who were myopes had varying degrees of astigmatism as opposed to only four hyperopes who had varying degrees of astigmatism. Furthermore, investigations revealed that the lowest myope in the study population was -0.75 OS, while the highest was -5.25 05. Likewise, the lowest hyperope was +0.75 OS

while the highest was +3.50 DS. Interestingly, results of the study showed that as high as fourteen (14) of the eighty (80) subjects (albinos) used for the study were presbyopes.

CONCLUSION

Refractive problems appear to be the most challenging of all the ocular related issues confronting albino patients resident in Owerri metropolis. The visual status of people living with albinism should therefore be accessed early enough with a view to correcting identified refractive errors to avoid amblyopia (lazy eye).

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