

Effect of Visual Acuity and Stereopsis on Ocular Deviation

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Abstract

Purpose: The aim of the present study is to correlate Visual acuity and Stereopsis in the presence of ocular deviation.

Methods: A pilot, cross sectional, observational study was performed at tertiary eye care centers. Subjects with Ocular deviation between 10 to 40 prism diopters, Corrected distance Visual Acuity should be greater than 6/18 and Age should be between 10 to 40 years of age were included in the study. Visual acuity was assessed with Log Mar chart and recorded in log units and Stereopsis was assessed with Titmus fly test.

Results: 30 subjects were included in the study. Out of that, 16 subjects were in the age group of 11-20 years, 12 subjects were in the age group of 21-30 years and 2 subjects were in the age group of 31-40 years. 60% subjects were Female and 40% subjects were Male. Mean scores of visual parameters were taken. Visual acuity was deteriorated to 0.193 log units. Stereopsis was deteriorated to 80 sec of arc in the presence of ocular deviation

Conclusions: Visual acuity and Stereopsis decreases significantly with increase in ocular deviation.

Keywords: Ocular Deviation; Visual Acuity; Stereopsis

Introduction

In case of Ocular deviation, images of an object fall on the para foveal region and deteriorate the visual performance. Among of the parameters of the visual performance Stereoacuity is also being hampered with increase ocular deviation [1]. Ocular deviation is also a very important factor for the Visual Acuity and 3rd grade of the Binocular Vision also it means Stereopsis also [2]. It mainly occurs due to Anatomical factor [3]. In the macular region it is seen that cone cell density is high in the foveal region compare to para foveal region. Cone cell is usually responsible for the Visual acuity. In case of Esodeviation

images of an object is fall on the nasal para foveal region and due to the deformity of the number of cone cell density and spacing between cone cells also can create deterioration of the Visual acuity [4,5]. In case of Exodeviation images of an object is fall on the temporal para foveal region and due to the deformity of the number of cone cell density and spacing between cone cells also can create deterioration of the Visual acuity [6].

Eso deviation is much more dangerous compare to Exo deviation because in case of Eso deviation intermittent time is very less compare to Exo deviation [7]. In case of Ocular deviation abnormality Stereo acuity is also be chances of hampered. If it is being explained in aspect of

Horopter we can recapitulate that centrally it is thin compare to periphery. So in case of eso deviation images are fall on the nasal part of the macula it means nasal peripheral part of the Horopter and due to its there may be chances of deterioration of Stereopsis compare to central part of the Horopter or fovea. So in case of exo deviation images are fall on the temporal part of the macula it means temporal peripheral part of the Horopter and due to its there may be chances of deterioration of Stereopsis compare to central part of the Horopter or fovea. Horopter is the certain area where highest visual acuity is achieved and it is deteriorated towards periphery and same things is being continued for 3rd grade of the BSV and mainly due to number of cone cell deformity. So, it is being fact that ocular deviation is very considerable factor for these parameters.

Methodology

A pilot, cross sectional, observational study was performed at tertiary eye care centers. Subjects with Ocular deviation between 10 to 40 prism diopters, Corrected distance Visual Acuity should be greater than 6/18 and Age should be between 10 to 40 years of age were included in the study. Individuals with any other systemic disease(specially which can affect study), Individuals with any other Ocular Pathology, with any active ocular infection, any ocular anomalies like Corneal Scar etc ,ocular deviation if less than 10 degree and Significant amount of amblyopic patient were excluded from the study. Full refractive correction along with detailed fundus evaluation was performed in each and every patient. Visual acuity was assessed with Log Mar chart and recorded in log units. Stereopsis was measured with Titmus Fly Test. Data was analyzed using SPSS software version 20.

Results

30 subjects were included in the study. Figure 1 shows distribution of subjects in various age groups. 16 subjects were in the age group of 11-20 years, 12 subjects were in the age group of 21-30 years and 2 subjects were in the age group of 31-40 years. Figure 2 shows gender wise distribution of the subjects. 60% subjects were Female and 40% subjects were Male. Mean scores of visual parameters were taken using SPSS Software version 20. Figure 3 shows Visual acuity was deteriorated to 0.193 log units. Figure 4 shows mean Stereopsis was deteriorated to 80 sec of arc.

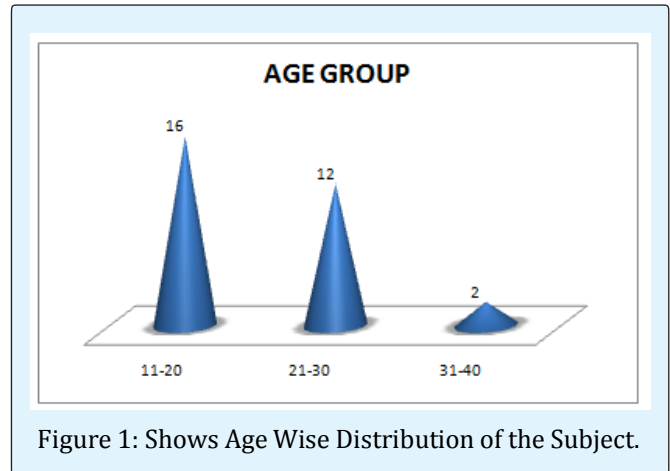


Figure 1: Shows Age Wise Distribution of the Subject.

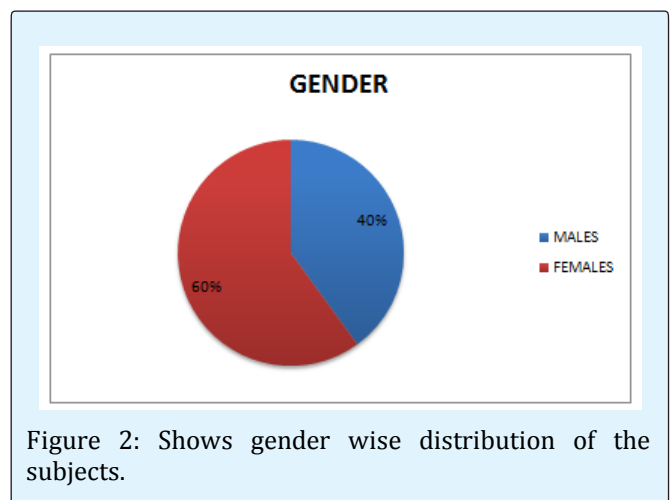


Figure 2: Shows gender wise distribution of the subjects.

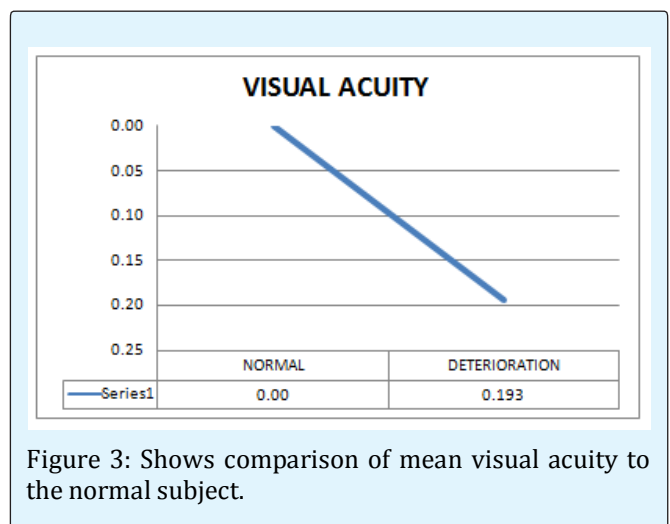


Figure 3: Shows comparison of mean visual acuity to the normal subject.

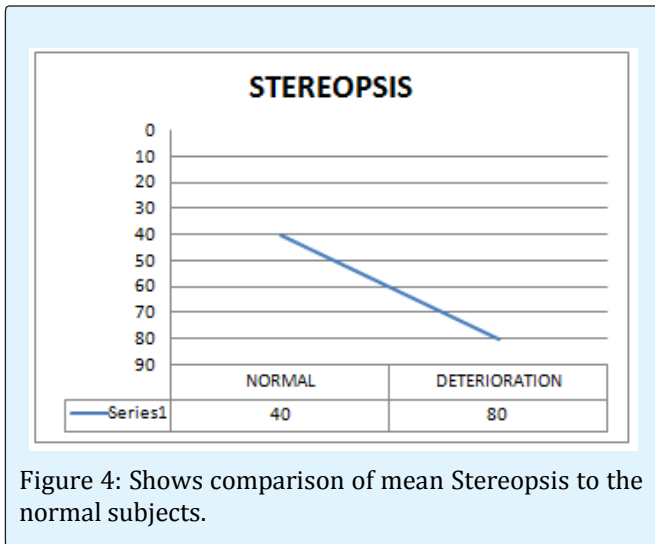


Figure 4: Shows comparison of mean Stereopsis to the normal subjects.

Discussion

With increase in ocular deviation images are shifted from the foveal region to para foveal region and due to this there are chances of deterioration of visual acuity and stereo acuity. Normal values of Visual acuity and Stereopsis are 0.00 log unit and 40 sec. of arc respectively. It mainly occurs due to cone cells deformity in the macular region. Thus, statistically mean visual acuity has dropped to 0.193 with deterioration of Stereopsis to 80 seconds of arc. It has been proved that with increasing ocular deviation visual acuity and stereo acuity has been deteriorated proportionately.

Conclusion

Visual acuity and Stereopsis decreases significantly with increase in ocular deviation.

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