

EFFECT OF OCULAR DEVIATION ON CONTRAST SENSITIVITY

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Author's contributions

This work was carried out in collaboration between both authors. Author PHC had wrote the full thesis. Author BHS had managed the data collection along with the formatting of the article. Both authors had read and approved the final manuscript.

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ABSTRACT:

Purpose: The present study aims to correlate contrast sensitivity in the presence of ocular deviation.

Methods: A pilot, cross-sectional, observational study was performed at tertiary eye care centers. Subjects with an 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. Contrast sensitivity was recorded with Pelli Robson Contrast Sensitivity chart.

28 **Results:** 30 subjects were included in the study. All the patients were included with informed
29 consent. Out of that, 16 subjects were in the age group of 11-20 years, 12 subjects were in the
30 age group of 21-30 years and 2 subjects were in the age group of 31-40 years. 60% subjects
31 were Female, and 40% subjects were Male. Mean scores of visual parameters were taken.
32 Contrast sensitivity was deteriorated to 1.695 in the presence of ocular deviation.

33 **Conclusions:** In cases of ocular deviation, contrast sensitivity deteriorates significantly.

34 **Keywords:** Ocular Deviation, Contrast Sensitivity

35 **INTRODUCTION:**

36 Human eye is an organ that is capable of receiving visual images, which are then carried to
37 the brain. It shows the major efficiency as the most potent sense organ, i.e. to generate image.
38 An ocular deviation is the sense of eye movements where the key eyeball moves towards the
39 upward as well as, to the opposite direction. As a result, some skew deviation occurs due to
40 pre-nuclear vestibular input to the ocular motor nuclei. This occurs due to brainstem or
41 cerebellar stroke. Variability of this particular issue depends upon the quantification of eye
42 position in strabismus [8]. Visual acuity judges the acuteness of vision, which is determined
43 to quantify the strength of a person to detect an object or maximum place that covers up to a
44 single set of vision. It can be said from the various cross-sectional study that, large horizontal
45 rectus recession can improve visual acuity and decrease nystagmus in sensory and motor
46 types. By revision in surgical planning, strabismus and abnormal head posture can also be
47 corrected. [9] This particular study is aimed to correlate contrast sensitivity in the presence of
48 ocular deviation. [1-7]

49 *Contrast sensitivity* is an essential measure of visual function, especially in situations of low
50 light, fog or glare, when the *contrast* between objects and their background often is reduced.
51 Driving at night is an example of an activity that requires good *contrast sensitivity* for safety.
52 The ocular deviation can be also determined with the help of the pattern of contrast
53 sensitivity.

54 **METHODOLOGY:**

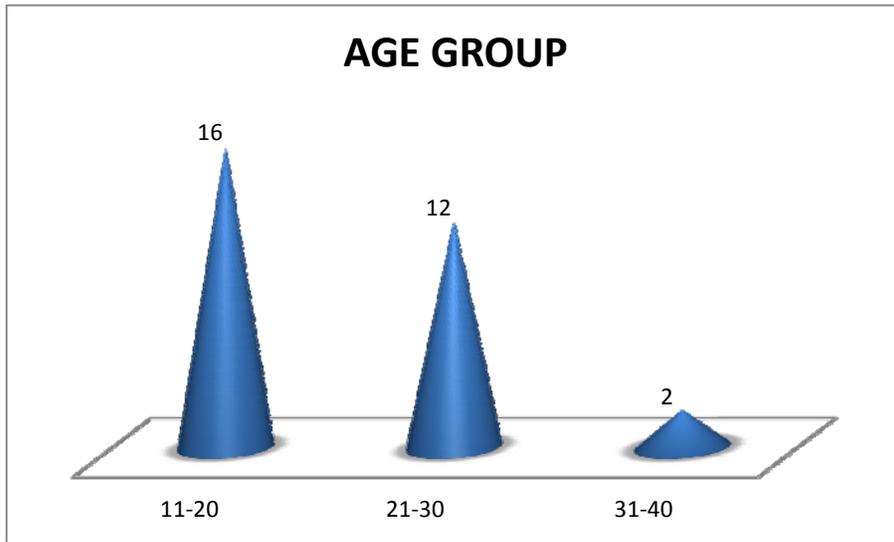
55 ❖ A pilot, cross-sectional, observational study was performed at tertiary eye care
56 centers. Subjects with Ocular deviation between 10 to 40 prism diopters, Corrected
57 distance Visual Acuity should be greater than 6/18 and Age should be between 10 to
58 40 years of age were included in the study. Individuals with any other systemic
59 disease(specially which can affect study), Individuals with any other Ocular
60 Pathology, with any active ocular infection, any ocular anomalies like Corneal Scar
61 etc , ocular deviation if less than 10 degree and Significant amount of amblyopic
62 patient were excluded from the study. Full refractive correction along with detailed
63 fundus evaluation was performed in each and every patient. Contrast sensitivity was
64 assessed with Pelli Robson Contrast Sensitivity Chart. Data was analysed using SPSS
65 software version 20.

66

67 ❖ **RESULTS:**

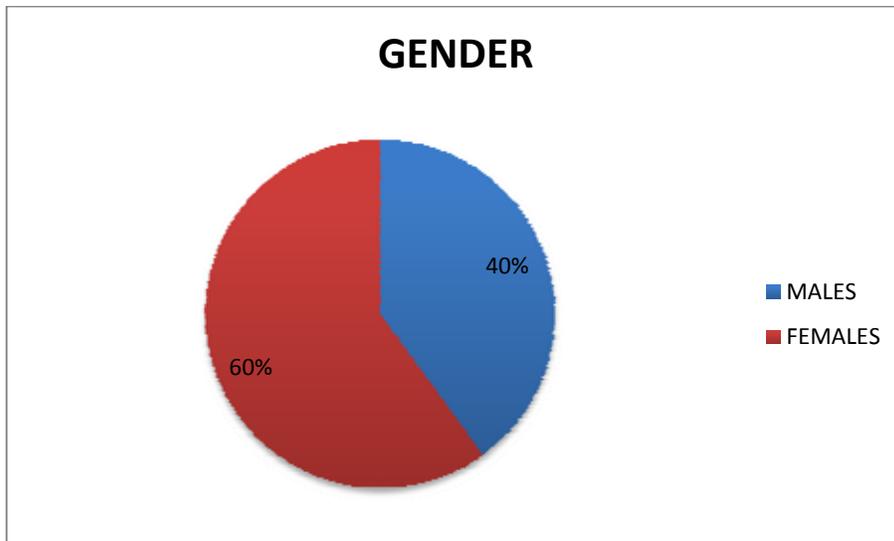
68 30 subjects were included in the study. Graph 1 shows distribution of subjects in various age
69 groups. 16 subjects were in the age group of 11-20 years, 12 subjects were in the age group of
70 21-30 years and 2 subjects were in the age group of 31-40 years. Graph 2 shows gender-wise
71 distribution of the subjects. 60% subjects were Female and 40% subjects were Male. Mean
72 scores of visual parameters were taken using SPSS Software version 20. Graph 3 shows mean
73 contrast sensitivity was deteriorated to 1.695

74 GRAPH 1: SHOWS AGE WISE DISTRIBUTION OF THE SUBJECT



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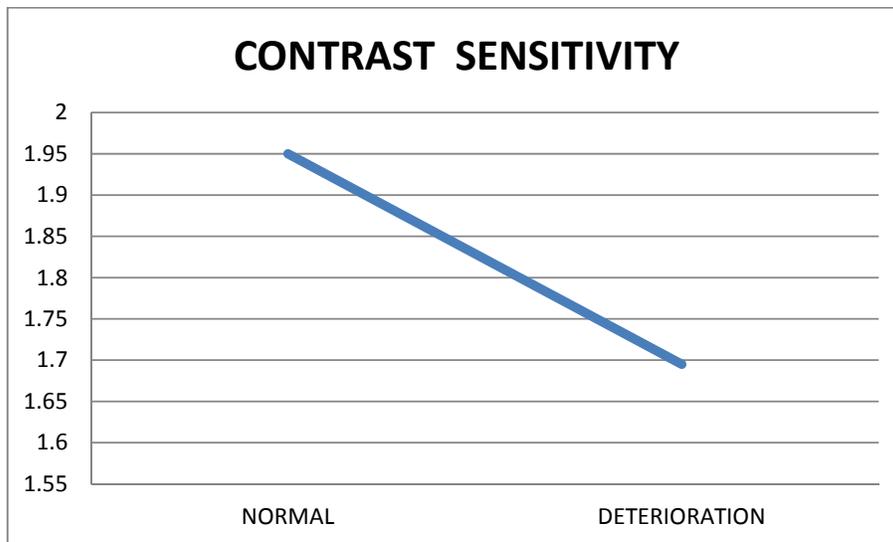
76 GRAPH 2 shows a gender-wise distribution of the subjects



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78

79 Graph 3 : Shows comparison of mean contrast sensitivity to the normal subjects



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81 **Discussion:**

82 Contrast Sensitivity of a healthy individual is 1.95. In cases of ocular deviation, contrast
 83 sensitivity decreases significantly. According to statistical analysis, contrast sensitivity is
 84 deteriorated to 1.695. With an increase in ocular deviation, contrast sensitivity is deteriorated
 85 significantly. It mainly occurs due to cone cell variation in the macular region. The number of
 86 cone cells is highest in the foveal region compare to parafoveal region. Cone cells are
 87 completely responsible for Contrast Sensitivity, so if any anomaly is present in cone cells,
 88 then problem with contrast sensitivity will be enhanced.

89 **Conclusion:**

90 **Contrast sensitivity decreases significantly in cases of ocular deviation.**

91 **CONSENT :**

92 Written consent was obtained from patient as well as from tertiary eye care centres.

93 **ETHICAL APPROVAL:**

94 It is not applicable.

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