

EFFECT OF COLOUR VISION ON OCULAR DEVIATION

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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 aim of the present study is to correlate the effect of colour vision 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. Colour vision was assessed with Fransworth Munsell D 15 colour vision test.

28 **Results:** 30 subjects were included in the study. Out of that,16 subjects were in
29 the age group of 11-20 years, 12 subjects were in the age group of 21-30 years
30 and 2 subjects were in the age group of 31-40 years. 60% subjects were Female
31 and 40% subjects were Male. Mean scores of visual parameters were taken. In
32 50 % of cases, colour vision was found normal, 33 % were having mild
33 tritanopia and 17% were having moderate tritanopia.

34 **Conclusions:** In cases of ocular deviation, mild to moderate tritanopia can
35 occur.

36 **Keywords:** Ocular Deviation, colour vision

37 **INTRODUCTION:**

38 Colour vision plays an important role in Binocular Single Vision. [1,2]For
39 colour vision, cone cells are precisely responsible. In cases of normal ocular
40 deviation, images of an object fall on the foveal region. [3]Due to anatomical
41 deformity, number of cone cells varied from region to region in the macular
42 area. [4]That's why, in the ocular deviation, there are chances of deterioration of
43 colour vision in the presence of ocular deviation. [5,6]Image of an object will
44 fall on the para foveal region in cases of ocular deviation, so there are chances
45 that colour vision will deteriorate.[7]

46 **METHODOLOGY:**

47 A pilot, cross-sectional, observational study was performed at tertiary eye care
48 centers. Subjects with an Ocular deviation between 10 to 40 prism diopters,
49 Corrected distance Visual Acuity should be greater than 6/18 and Age should be
50 between 10 to 40 years of age were included in the study. Individuals with any
51 other systemic disease(specially which can affect study), Individuals with any
52 other Ocular Pathology, with any active ocular infection, any ocular anomalies
53 like corneal scar etc , ocular deviation if less than 10 degree and Significant
54 amount of amblyopic patient were excluded from the study. Full refractive
55 correction along with detailed fundus evaluation was performed in each and

56 every patient. Colour vision was assessed with Farnsworth Munsell D 15 colour
57 vision test.

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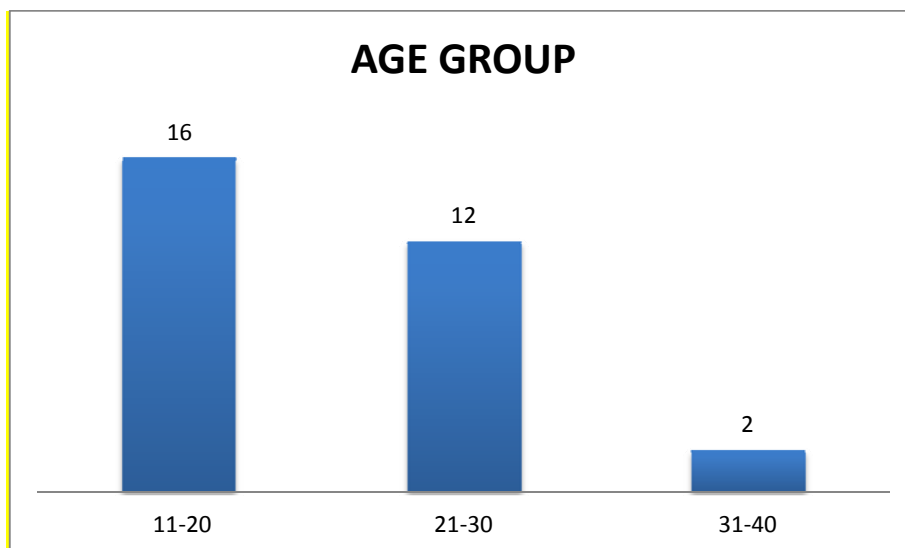
59 RESULTS:

60 30 subjects were included in the study. Graph 1 shows the distribution of
61 subjects in various age groups. 16 subjects were in the age group of 11-20 years,
62 12 subjects were in the age group of 21-30 years and 2 subjects were in the age
63 group of 31-40 years. Graph 2 shows gender-wise distribution of the subjects.
64 60% subjects were Female and 40% subjects were Male. Mean scores of visual
65 parameters were taken using SPSS Software version 20. Graph 3 shows 50 % of
66 cases, colour vision was found normal, 33 % were having mild tritanopia and
67 17% were having moderate tritanopia.

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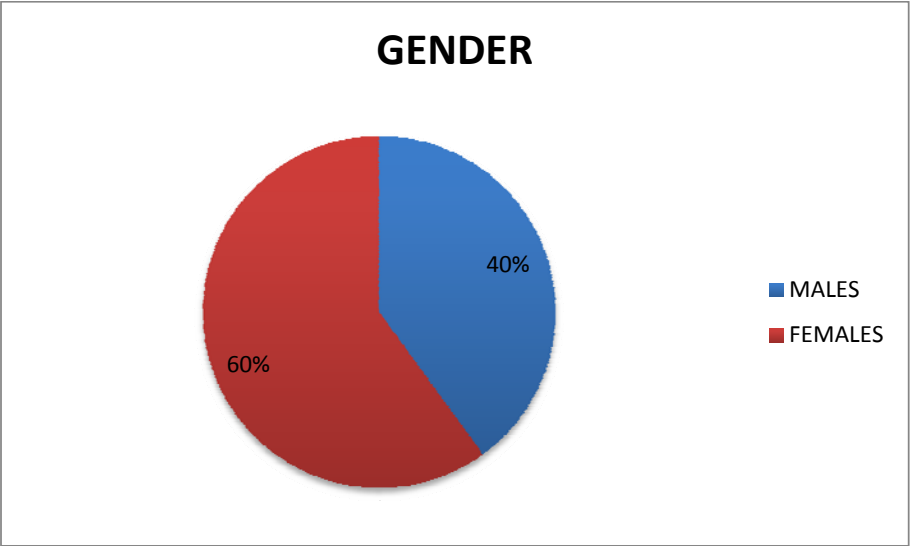
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70 GRAPH 1: shows age wise distribution of the subject



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72 GRAPH 2 shows gender wise distribution of the subjects



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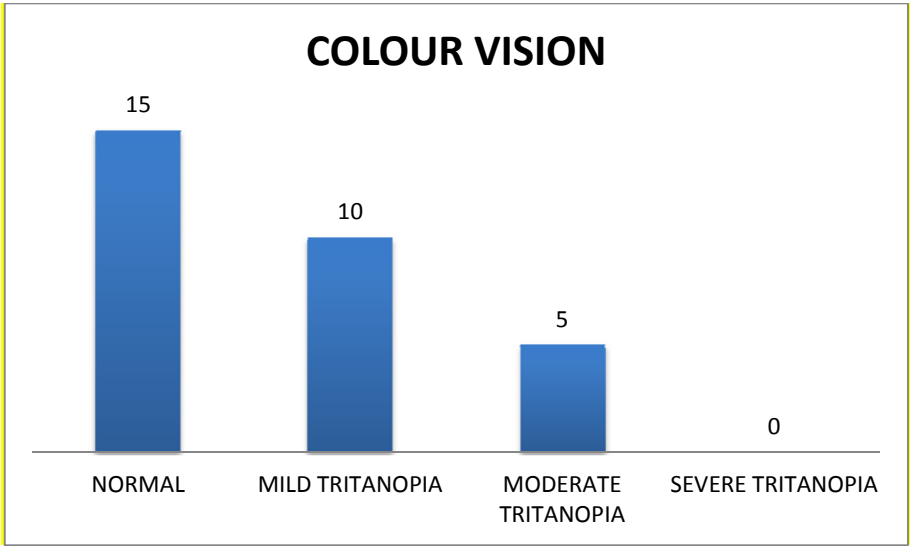
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79 Graph 3: shows effect of colour vision in the presence of ocular deviation.



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82 **Discussion:**

83 Colour vision was tested with Farnsworth Munsell D-15 colour vision test.

84 Here 30 subjects were evaluated. Out of that 15 were having a normal colour
85 vision, 10 were having mild tritanopia and 5 were having moderate tritanopia.
86 Severe tritanopia was not found in any patient. According to statistical analysis,
87 colour vision will deteriorate significantly with increase in ocular deviation. It
88 mainly occurs due to number of cone cell variation in the macular region. The
89 number of cone cells are highest in foveal region compare to parafoveal region.
90 Cone cell is completely responsible for Colour vision, so any anomaly in cone
91 cells will lead to deterioration of colour vision.

92 **Conclusion :**

93 In cases of ocular deviation, mild to moderate tritanopia can occur.

94 **CONSENT :**

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

97 **ETHICAL APPROVAL:**

98 It is not applicable.

99 **References:**

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