

## Effect of Colour Vision in Different Amount of Deviation of Esotropia

Partha Haradhan Chowdhury<sup>1\*</sup> and Brinda Haren Shah<sup>2</sup>

<sup>1</sup>M.Optom, Department of Optometry, Shree Satchandi Jankalyan Samiti Netra Prasikshan Sansthan, Pauri, Affiliated to Uttarakhand State Medical Faculty, Dehradun, India

<sup>2</sup>B.Optom, Department of Optometry, Gujarat University, Gujarat, India

**\*Corresponding Author:** Partha Haradhan Chowdhury, Department of Optometry, Shree Satchandi Jankalyan Samiti Netra Prasikshan Sansthan, Pauri, Affiliated to Uttarakhand State Medical Faculty, Dehradun, India.

**Received:** March 16, 2018; **Published:** May 10, 2018

### Abstract

**Purpose:** The aim of the present study is to compare the effect of colour vision in different amount of deviations in Esotropia.

**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. Colour vision was assessed with Fransworth D 15 colour vision 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. The mean colour vision was considered in each amount of deviation. It shows that colour vision will be deteriorated more as ocular deviation increases in cases of Esotropia.

**Conclusions:** In ocular deviation of Esotropia, as amount of deviation increases, Colour vision decreases gradually. Mild to Moderate Tritanopia occurs in increased amount of deviation.

**Keywords:** Esotropia; Amount of Deviation; Colour Vision

Volume 2 Issue 1 May 2018

© All Copy Rights Reserved by Partha Haradhan Chowdhury and Brinda Haren Shah.

### Introduction

In case of ocular deviation images of an object are falling on parafoveal region and due to inequality of the number of the cone cells in the macular region there may be chances of the Colour vision deterioration with increasing ocular deviation. In case of Esodeviation the images of an object is placed at the nasal retinal side and due to its intermittent stages is very low compare to Exodeviation. Thus there may be strong reason with increasing ocular deviation Colour vision deterioration is also being deteriorated.

### Methodology

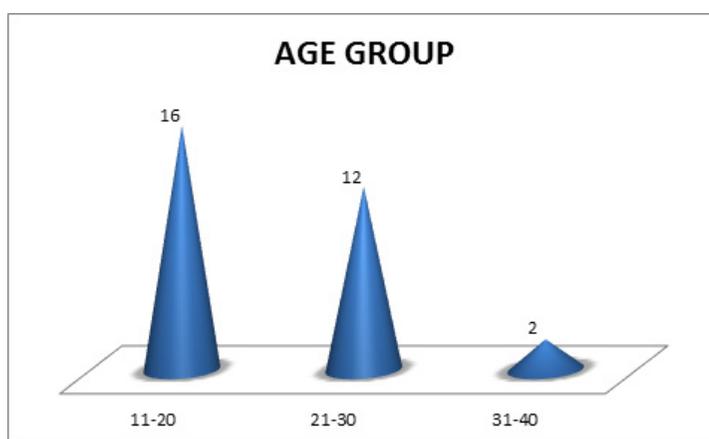
A pilot, cross sectional, observational study was performed at tertiary eye care centers. Subjects with Ocular deviation between 10 to 40 prism diopters, Corrected distance Visual Acuity should be greater than 6/18 and Age should be between 10 to 40 years of age

**Citation:** Partha Haradhan Chowdhury and Brinda Haren Shah. "Effect of Colour Vision in Different Amount of Deviation of Esotropia". *Ophthalmology and Vision Science* 2.1 (2018): 214-217.

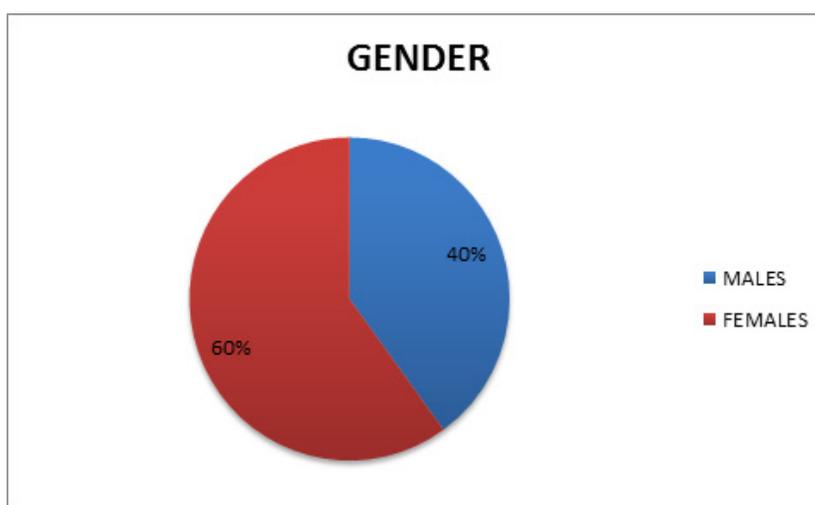
were included in the study. Individuals with any other systemic disease (specially which can affect study), Individuals with any other Ocular Pathology, with any active ocular infection, any ocular anomalies like Corneal Scar etc, ocular deviation if less than 10 degree and Significant amount of amblyopic patient were excluded from the study. Full refractive correction along with detailed fundus evaluation was performed in each and every patient. Colour vision was assessed with Frans worth D 15 colour vision test in different amounts of deviation in Esotropia.

## Results

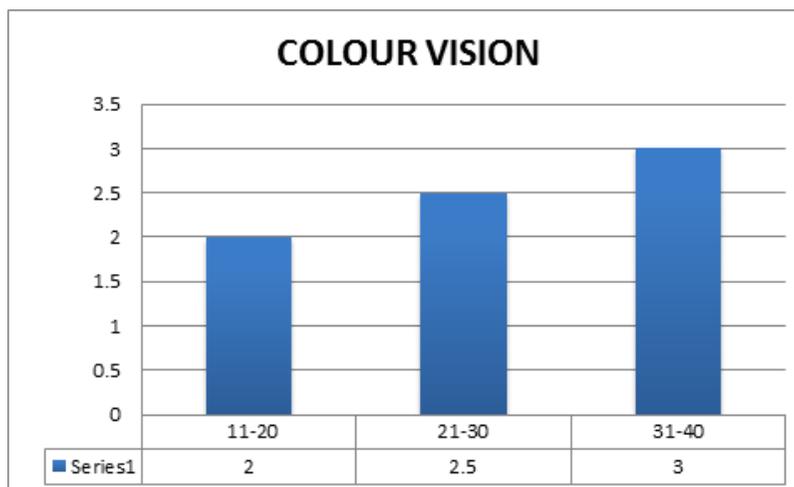
30 subjects were included in the study. Graph 1 shows distribution of subjects in various age groups. Graph 2 shows gender wise distribution of the subjects. Out of 30 subjects, 18 subjects were female and 12 subjects were male. Graph 3 shows comparison of Colour vision for different amount of deviation for Esotropia. 1 is indicated for normal colour vision, 2 is indicated for mild tritanopia, 3 is indicated for moderate tritanopia and 4 is indicated for severe tritanopia.



**Graph 1:** Shows Age Wise Distribution of the Subject.



**Graph 2:** Shows Gender Wise Distribution of the Subjects.



**Graph 3:** Shows comparison of Colour vision for different amount of deviation for Esotropia.

## Discussion

In this study, as per statistical analysis it shows that there is mild tritanopia in the ocular deviation of 11-20 prism diopters, mild to moderate tritanopia in 21-30 prism diopters and moderate tritanopia in 31-40 prism diopters. According to the present study, it has been showed that in cases of ocular deviation, images of an object fall on the Parafoveal region and deteriorates the colour vision. Esodeviation is more harmful as compared to Exodeviation, because intermittent timings are very less in Esodeviation as compared to Exodeviation. In case of Esodeviation mages of an object is fall on the nasal parafoveal region and according to the deformity of the anatomical arrangement of the photoreceptor cells in the macula that's why in the parafoveal region number of cone cells is less compare to foveal region. Just for this reason in case of Esodeviation images is shifted towards parafoveal region and due to less number of cone cells and according to the statistics it has been proved that with increasing Esodeviation color vision is been deteriorated

## Conclusion

In ocular deviation of Esotropia, as amount of deviation increases, colour vision decreases gradually. Mild to Moderate Tritanopia occurs in increased amount of deviation.

## References

1. Kenneth W., et al. "HANDBOOK OF PEDIATRIC STRABISMUS AND AMBLYOPIA". (2006):
2. Hui Zhu., et al. "Association between Childhood Strabismus and Refractive Error in Chinese Preschool Children". *Journal of Plos One* (2015):
3. Zhale Rajavi., et al. "Prevalence of Colour Vision Deficiency and its Correlation with Amblyopia and Refractive Errors among Primary School Children". *Journal of Ophthalmic and Vision Research* 10.2 (2015): 130-138.
4. Anika K Tandon., et al. "Binocular Inhibition in Strabismic Patients is Associated with Diminished Quality of Life". *Journal of American Association for Pediatric Ophthalmology and Strabismus* 18.5 (2014): 423-426.
5. Ye., et al. "Strabismus genetics across a spectrum of eye misalignment disorders". *Journal of clinical genetics* 86.2 (2014): 103-111.
6. AG KOCAK-ALTINTAS., et al. "Visual Acuity and Colour Vision deficiency in Amblyopia". *European Journal of Ophthalmology* 10.1 (2000): 77-81.
7. Alan W Freeman., et al. "Components of Visual Acuity Loss in Strabismus". *Journal of vision research* 36.5 (1996): 765-774.

**Submit your next manuscript to Scientia Ricerca Open Access and benefit from:**

- Prompt and fair double blinded peer review from experts
- Fast and efficient online submission
- Timely updates about your manuscript status
- Sharing Option: Social Networking Enabled
- Open access: articles available free online
- Global attainment for your research

Submit your manuscript at:

<https://scientiaricerca.com/submit-manuscript.php>