

Colour vision deficiency in Nepalese Medical and Nursing Students of different ethnicity

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Abstract

Introduction: Colour vision deficiency is a common but unnoticed condition. Medical students must be aware of their congenital colour vision deficiency and its effects on their work, so that color vision deficient student may not choose the discipline such as pathology and radiology, where colour vision is very important.

Methods: This is a cross-sectional study conducted in the Department of Clinical Physiology, Maharajgunj Medical Campus, Institute of Medicine, Kathmandu from February 2013 to January 2016. Total of 556 medical and nursing students selected by convenient sampling, underwent color vision evaluation by using Ishihara chart.

Results: Out of 302 male students, 20 (6.6%) were color vision deficient. Similarly, out of 254 female students, two (0.8%) were colour vision deficient. Among the male students, two (10%) were total colour blind, eight (40%) were suffering from deuteranomaly and 10 (50%) were suffering from deuteranopia. Colour vision deficiencies were observed more in Chhetri (9.5%), followed by Brahmin (7.1%) and Madhesi ethnicity (6.9%).

Conclusion: The prevalence of colour vision deficiency in Nepalese medical students is significant. Therefore, they should be screened for colour vision deficiency, so that the students with colour vision defect can choose appropriate discipline as their future carrier where colour vision defect may not affect their work.

Key words: colour vision deficiency, Ishihara chart, ethnicity

Introduction

Congenital colour vision deficiency is an X-linked recessive disease which affects as many as 8% of males and 0.5% of females. In European Caucasians, about 8% males and 0.4% females are color vision deficient¹. As males contain XY chromosomes in their germ cells, they develop color blindness if the X chromosome contains the defective gene. On the other hand, females develop color blindness only when both the X chromosomes are defective, which is rare. So, color blindness mainly affects males.

The physiological substrate of colour vision is the cone photoreceptor, of which there are three classes-the blue, green and red cones, also known as the short, medium and long wavelength sensitive cones, respectively^{2,3}. Normal color vision depends on the integrity of the three types of cones. Absence or malfunction of one or more than one type of cone cells lead to different forms of color vision deficiencies. About 6% of the affected males are trichromats. These are the individuals with all three cone systems, but one of the cone systems is defective. So their ability to recognize one of the primary colors is decreased. Deuteranomaly is the most

common form of trichromats. About 2% of the affected males are dichromats. These are the individuals with two cone systems and the third cone system is absent. Deuteranopia is the most common form of dichromats. The monochromats cannot appreciate any color because they have only one cone system^{3,4,5,6}.

Medical students must be aware of their congenital color vision deficiency and its effects on their work. So, they become aware of limitations of their power of observations and step down from choosing certain medical disciplines like pathology and radiology where color vision is very important in disease diagnosis.

Methods

It was a cross sectional study conducted in the Department of Clinical Physiology, Maharajgunj Medical Campus, Institute of Medicine, Kathmandu from February 2013 to January 2016. Total 302 male students and 254 female students selected by convenient sampling underwent color vision evaluation by using Ishihara isochromatic color plates. The subjects were asked to sit in a room with sufficient light and read the chart. The types of colour vision deficiency were determined with the help of key provided with the chart. Data was analyzed using IBM SPSS Statistics programme.

Results

Out of 302 male students, 20 (6.6%) were color vision deficient. Among them, two (10%) medical students were total colour blind (could not appreciate any primary color), eight (40%) were suffering from deuteranomaly and 10(50%) were suffering from deuteranopia. Similarly, out of 254 female students, two (0.8%) were colour vision deficient (deuteranomaly). According to ethnic-wise distribution,color vision deficiency was most common in Chhetri (9.5%), followed by Brahmin (7.1%) and Madhesi ethnicity (6.9%).

Table 1. Number of male and female participants and frequency of color deficiency

	Number of participants	Number of color vision deficient participants
Male	302 (54.3 %)	20 (6.6%)
Female	254 (45.7 %)	2 (0.8%)
Total	556 (100.0 %)	22 (4.0%)

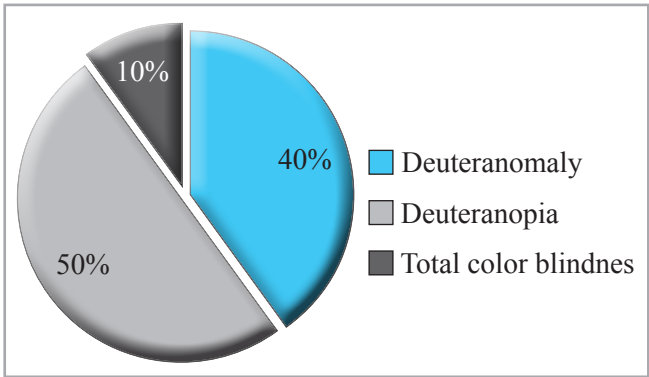


Figure 1. Pie-chart of percentage distribution of various types of color vision deficiencies in males (n=302)

Table 2. Prevalence of color vision deficiency in male participants of different ethnic groups (n=302)

Ethnicity	Number of male participants	Number of color vision deficient participants
Brahmin	170	12 (7.1%)
Chhetri	42	4 (9.5%)
Madhesi	58	4 (6.9%)
Newar	26	0 (0.0%)
Magar	2	0 (0.0%)
Tharu	4	0 (0.0%)
Total	302	20 (6.6%)

Discussion

The prevalence of congenital colour vision defects was 6.6 % in male students and 0.8% in female students. This finding was quite similar to the study done by Birch J. where colour vision defect was 8% in European Caucasian men and 0.4% in women¹.A study done in Croatia showed quite similar results i.e.8.5% colour vision defects in Mediterranean Croatia⁷. But the prevalence of colour vision defects in school children in Pokhara city, Nepal came out to be 3.8% only, out of which nine, six and three boys were suffering from deuteranopia, deuteranomaly and protanomaly respectively. The highest percentage of prevalence was found in Darji (14.3%), followed by Newar (9.1%), Brahmin (5%), Gurung (5.1%), Chhetri (2.8%) and Magar (2.1%)⁸. According to the study done in Manipal College of Medical Sciences, Pokhara city, the prevalence of congenital colour vision defects was 10.97% in males (n=501) and 2.97% in females (n=470)

and it was most common in Chhetri (14.38%), followed by Brahmin (10.16%) and Magar (9.89%).⁹ In our study, ten subjects were affected from deuteranopia, eight from deuteranomaly and two were total colour blind. So the prevalence of deuteranopia and deuteranomaly is more common than other types of colour vision defects. According to our study, the highest prevalence of colour vision deficiency was found in Chhetri (9.5%), followed by Brahmin (7.1%) and Madhesi ethnicity (6.9%). Another study conducted in school going children in Kathmandu valley showed little less prevalence of colour vision defects which is only 3.9% in male students (n=1050) and zero in female students (n=951).¹⁰ But as expected, the prevalence of colour vision defects was only 0.35% in Saudi females (n=7,467).¹¹ A study conducted in Nepal Medical College, Jorpati, Kathmandu showed 5.58% colour vision defects, out of them, one was suffering from total colour blindness, one was protanomaly, three were deuteranomaly and seven were deuteranopia.¹²

The different results in ethnic-wise distribution of colour vision defects might be because of the different ethnic sample size in different studies. Regarding the prevalence of various types of colour vision deficiency, significant number of deuteranomaly and deuteranopia were noted in this study which is comparable to the findings of some other studies. The percentage distributions of colour vision deficiency are different in different studies in Nepalese community. So, a further study in a large sample size is necessary to find out the accurate prevalence of colour vision deficiency among different ethnic groups of Nepal.

Conclusion

Colour vision deficiency is one of the common disorders of vision in Nepalese population. Medical students should be screened for colour vision deficiency so that the students with colour vision deficiency can choose appropriate discipline as a future carrier where colour vision defect may not affect their work and they can take special care while practicing medicine.

Conflicts of interest: None declared.

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Original Article

Depression in survivors of female trafficking in shelter homes of Kathmandu Valley

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Abstract

Introduction: Human trafficking is the recruitment and movement of individuals most often by force, coercion, or deception for the purpose of exploitation. There is very limited evidence on the health consequences of human trafficking. This study were to find out the prevalence of depression among survivors of female trafficking in the shelter homes of Kathmandu valley and also to find out severity of depression (mild, moderate and severe) among the survivors of female trafficking.

Methods: A cross- sectional design was implemented. A total of 67 participants was collected from 4 different NGOs working in the field by using probability proportion to size method and from each NGOs the participants were taken using purposive sampling. The consent was taken and strict inclusion and exclusion criteria were applied during participant's selection. The semi- structured proforma was filled with adequate information. Clinical diagnosis of depression was made according to ICD-10 classification of Mental and Behavioral Disorders-Diagnostic Criteria for Research (WHO-1992) in patients and Hamilton Rating Scale for Depression (HAM-D) was used to assess the severity of depression (mild, moderate and severe). Finally, information obtained from demographic profile, clinical features, and rating scale was analyzed by using suitable statistical tools.

Results: The study showed out of all 67 female human trafficking victims interviewed from 4 major shelter homes in Kathmandu valley a majority were found to be from the 16 to 20 years age group during the time of interview. Most victims were found to be trafficked at a young age, 11-15 years. A majority of them were lured with job proposals mostly by their own family members. Victims were mostly lead to India for trafficking as sex workers. Based on ICD 10 DCR 61.2% of the victims were found to be suffering from depression among which according to HDRS 16.4% had severe and 4.5% had very severe depression.

Conclusion: Despite a dramatic increase in the profile of human trafficking over the past decade, the evidence on trafficked people's experiences of violence and of depression and other mental health problems is extremely limited. Depression is quite common and more information is needed on trafficked people's health needs and experiences, including evidence on interventions to mitigate the physical and psychological damage associated with this global crime.

Introduction

Human trafficking is a human rights violation and modern form of slavery that occurs in and between most countries around the world.¹ Although this phenomenon is not new and the initiatives to combat the problem

have been enormous in volume and coverage, the numbers of trafficked persons specially girls and women are rising. According to a conservative estimate by the International Labor Organization, around 2.4 million people—overwhelmingly women and girls—are currently in forced labor as a result of trafficking, creating