



ORIGINAL RESEARCH PAPER

Ophthalmology

A STUDY OF COLOUR VISION DEFICIENCY (CVD) IN THE MEDICAL STUDENTS

KEY WORDS: Colour vision deficiency (CVD), Colour blind, medical students

Dr. Yuri Kashiv

(M.S) JUNIOR RESIDENT, Department of ophthalmology, Gandhi Medical College and Hamidia Hospital, Bhopal, M.P, India.

Dr. Purvi Baria*

JUNIOR RESIDENT (D.O.M.S), Department of ophthalmology, Gandhi Medical College and Hamidia Hospital, Bhopal, M.P, India. *Corresponding Author

ABSTRACT

PURPOSE- To know the prevalence of colour vision deficiency (CVD) in students of medical college and to assess the problems CVD poses in their medical training. **MATERIAL AND METHODS-** Present study was conducted from July to December of 2018, at Medical college of Bhopal, M.P. This cross sectional study was conducted among the MBBS students in the age group 18 to 25 years. Sample size was 600 students. The colour vision testing was performed by Ishihara chart. Each eye was tested separately. **RESULTS-** In the present study 600 medical students (287 boys & 313 girls) were assessed for CVD. Among them 18 out of 600 were found to be colour blind, in this study of 600 students the prevalence of Deutan & Protan defect was 2.5% and 0.5% respectively. Among 287 boys assessed for CVD, 13 were found to be colour blind & out of 313 girls only 5 were found. None of the CVD students faced any major difficulty in assessing and reading various diagnostic modalities, slides, charts & other clinical signs, which would markedly affect their diagnostic and treatment capabilities. **CONCLUSION-** Screening for CVD in medical students would allow testing for severity, counselling and an informed choice of career.

INTRODUCTION -

Colour vision deficiency or colour blindness is the inability or decreased ability to see colours or perceive colour differences under normal settings(1).

Colour blindness is an abnormal condition characterized by the inability to clearly distinguish different colours of the spectrum. Human colour vision is normally trichromatic i.e. the mixture of red, green and blue lights(2). Most colour vision defects are congenital and permanent. Red-Green defects show the highest prevalence in the general population(3). Being a genetic disorder, the incidence of colour blindness varies from race to race and different in the different geographical regions of the world inhabited by people of different ethnicity(4). Asian males have a prevalence of colour vision defects of 4.9% compared to 0.6% in females(5). Using a literature search, the results indicate the prevalence of CVD in the medical profession & its effect on medical skills, because of certain features of their work, general practitioners may have special problems. Thus, it is concluded that medical students should be screened for the deficiency and advised about it and that there should be more study of effect of CVD on clinical work & decision making in some special branches on medical students. Aim of the study is to evaluate the presence of congenital colour vision deficiencies among the medical students.

AIM-

1. To know the prevalence of colour blindness among the students of the medical college.
2. To assess whether colour blind medical students face any problem in their medical profession.

Materials and method- Present study was conducted from July to December of 2018 at Medical college of Bhopal, M.P. This cross sectional study was conducted among medical students of 1st, 2nd, 3rd & 4th year MBBS students in the age group 18 to 25 years. Sample size was 600 students, both male & female with their best corrected visual acuity were taken into account. Informed consent from the students was obtained.

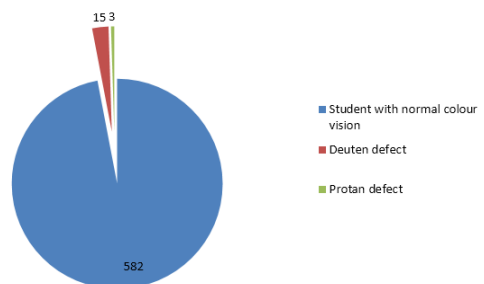
The colour vision testing was performed by Ishihara chart. The subject were seated in a well illuminated room & asked to read the chart, keeping it 75 cm away from the eyes and the time given for telling the number was less than 5 seconds. Each eye was tested separately.

Normality or defectiveness of colour vision was determined by assessment of the readings of plates 1 to 21. If 17 or more plates are read normally, the colour vision was regarded as normal. If only 13 or less than 13 plates were read normal, the colour vision was regarded as red green deficient. However, in references to plates 18, 19, 20, and 21, only those who read the numerals 5, 2, 45, and 73 and read them easier than those on plates 14, 10, 13, and 17, were recorded as red green deficient. Furthermore, the subtypes of red green deficiency i.e. Protan & Deutan is determined by the assessment of plates no. 22, 23, 24, & 25. To know about the difficulty faced by colour blind students, they were asked a series of questionnaire, pertaining to their medical training & the problems if any, they were facing because of colour blindness. Special emphasis was given to specific signs/diagnostic modalities, which a medical student goes through during his medical training like pallor, cyanosis, jaundice, rashes, colourful charts, slides, test strips for blood, urine and faeces, microscopy, impressions on Ishihara charts, tissue identification in surgery etc.

RESULTS-

In the present study 600 medical students (287 boys & 313 girls, Age 18 – 25 years) from medical college of Bhopal, M.P. was assessed for CVD. Among them 18 out of 600 were found to be colour blind i.e 3%.

Only 18 (3%) students out of 600 were found to be red green deficient. Out of those 18 students, 15 (83.3%) & 3 (16.6%) students were found to have Deutan & Protan defect respectively. Thus the prevalence of Deutan & Protan defect was 2.5% and 0.5% respectively. (fig 1)



Among 287 boys assessed for colour vision deficiency 13 were found to be colour blind & out of 313 girls only 5 were

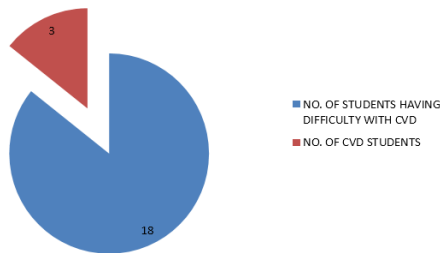
found colour blind, none of the boys or girls were found to be totally colour blind.

Table 1- Gender Difference

Gender difference	Total number of students assessed	Colour vision deficient	%
Boys	287	13	4.52
Girls	313	5	1.62

Regarding problems faced by medical students in their medical training due to CVD, we found out that among all students, none of the CVD students faced any major difficulty in assessing and reading various diagnostic modalities, slides, charts & other clinical signs, which would markedly affect their diagnostic and treatment capabilities.

Although in our study, we found that 3 out of 18 CVD students faced some minor problems because of their defect , for which they needed some professional help & training. Rest of the CVD students managed their medical curriculum easily or similar to normal colour vision students. (fig.2)



DISCUSSION-

The present study was undertaken to determine the prevalence of colour vision deficiency in medical students and to assess the problem they poses in their medical training. Regarding the Prevalence of colour blindness, in our observation of 600 students 18 (3%) had colour vision deficiency, none of them was total colour blind.

Liaquat ali(6), Department of anatomy, university medical & dental college, Faisalabad , worked on "colour vision deficiency (CVD) in the medical & allied occupations" and found Prevalence of CVD among students was 2.4%. Rawlison , 1993 (7), in England. Prevalence of CVD was evaluated in a population of 235 dental undergraduates , and found prevalence of colour blindness was 3%, which is same as our study.

Regarding the prevalence of Deutan & Protan defect , O Matthew oriowo and Abdullah Z Alotaibi,(8) found that the prevalence of Deutan defect was 4.3% & Protan defect was 1.55%. In our study prevalence of Deutan & Protan defect was found to be 2.5% & 0.5% respectively, which is lower than the prevalence found in above written study.

In an another study held at COLOMBO,(9) the prevalence of Deutan defect was 55.55% . In our study we found the prevalence of Deutan defect was 83.3% which shows Deutan defect is higher in our study.

Regarding Sex Prevalence, colour vision deficiency among boys was 4.52% and among girls 1.62%. Prevalence is higher among boys. O Matthew oriowo and Abdullah Z Alotaibi,(8) worked on "colour vision screening among Saudi arabian children" & found Prevalence of CVD was 3.3%. Prevalence among girls was 0.75% & among boys was 5.85%.

The Study of R Balasundaram, Sagili chandrasekhara reddy(10) shown the prevalence of CVD in male students was 5.2% & in female students was 0.3%.

In our study, Pattern of distribution of prevalence rates among

males & females are not significantly different from that found among above mentioned studies. However, prevalence for females in the present study is higher than the previous studies.

With regards to problems if any, faced by medical students due to CVD in their medical training, previous studies and research are rare. In our study, we found that colour blind students faced no major difficulty and only 3 out of 18 students (16.66%) faced some minor problems in their medical training curriculum. Those CVD students, who found difficulty in their training, may need special attention from medical faculty. Special training modalities should be developed to assist these students to compensate in the areas where they are lacking. They should be taught to identify various colours, according to contrast variations and a protocol should be set for it. This is important because these students would be future doctors & surgeons who need to perform efficiently & perfectly for betterment of the patients. For those students who managed to cope up with their CVD and did not face any more difficulty in their training as compared to normal colour vision students , no special training would be required still they could be watched carefully by faculties and should be counselled to take specialized branches of medicine & surgery keeping in view of their CVD and the problems it may pose to them.

CONCLUSION-

Screening for CVD in medical students would allow testing for severity, counselling and an informed choice of career. A more detailed examination of effects of CVD on decision making is necessary for general practice and also in a number of specialities; for eg, ophthalmology, paediatrics, gastroenterology and pathology.

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