NOVATEUR PUBLICATIONS
JournalNX- A Multidisciplinary Peer Reviewed Journal
ISSN No: 2581 - 4230
VOLUME 7, ISSUE 2, Feb. -2021

COLOR BLIND DETECTION AT STUDENTS GORONTALO STATE UNIVERSITY

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ABSTRACT:

One of the disorders that occur in the eye is color blindness. Color blindness is a condition where one can not distinguish a certain color that can be distinguished by a person with a normal eye. The purpose of this study was to find out whether the probandus tested suffered from color blindness. This research uses observation method that is collecting data by performing observation and direct documentation on matters relating to color blind test, so that obtained a clear picture about the object under study. Data analysis is done by using descriptive method. The results show that from 97.5% test probandus can read numbers and colors and 2.5% have color blindness and are included in partial color blindness. Conclusion in this research that some probandus have been tested by ishihara method have normal eye and partial partial blindness probandus.

KEYWORDS: Color blind, Ishihara Test, Partial.

INTRODUCTION:

One of the disorders that occur in the eye is color blindness. Color blindness is a condition in which a person cannot distinguish certain colors that can be distinguished by people with normal eyes. A person suffering from color blindness can be caused by abnormalities from birth or due to excessive use of drugs. Color blindness generally affects men, while women are only a carrier / recessive gene. Currently in europe about 8-12% of men and 0.5-1% of women suffer from color blindness. Another study states that one in 12 men suffer from color blindness, while only 1 in 200 women suffer from color blindness (kurnia, 2009).

The ability of the cones in the retina makes it impossible for the family tree to have color blindness. Given that one of the causes of color blindness is a gene inherited from offspring where the gene that regulates color blindness is linked to sex on the x chromosome. It could be normal women or color blind carriers. The cones and rod cells in the retina have different functions. Stem cells cannot distinguish colors and are more sensitive to light. Cones require more light to stimulate these cells. Color vision results from the presence of three subclasses of cone cells, each of which has its own type of opsin and associated retinal to form the visual pigment photopsin. Photoreceptors as red, green and blue cones. The absorption spectra for these

pigments overlap and the brain's perception of intermediate features depends on the difference in stimulation of two or more cones. For example, when red and green cones are stimulated we may see a yellow or orange color, depending on which cone cells are stimulated the most. Color blindness is more common in men than women because it is generally inherited as a sex-related trait (campbell, 2002).

RESEARCH METHODS:

This research was conducted in Gorontalo City, especially in the UNG campus area. When the research was conducted on April 14-May 1 2018. The research subjects used were 200 probandus. The tools used in this study were the paper color blindness test (Ishihara's test), stationery and Probandus. The research was carried out by writing down the name of the probandus who will be tested for color blindness then guessing the number on the plate with a maximum answer time of 30 seconds and writing what is seen in the color blind test book in the columns that have been provided then matching the results obtained with the numbers / pictures that should be, then calculates what percentage of errors were made in that test. There are several data collection methods to achieve the objectives and benefits of this research, which include: Interviews, Observations, Literature Studies.

DISCUSSION:

Color blindness is a hereditary disease caused by the c recessive gene because the gene is contained in the x chromosome while women have 2 x chromosomes.

Color blindness is divided into two, namely total color blindness and partial color blindness. People who suffer from partial color blindness cannot see some colors, namely red, green, blue and yellow, while people who suffer from total color blindness cannot see all colors except black and white.

In the observation of the color blindness test of 200 probandus that has been done, the Ishihara method is used. According to Guyton in Giarratano et al (2005), the ishihara method is a method that can be used to quickly determine a color blindness disorder in the form of a pseudoisochromatic sheet (plate) composed of dots with different color densities that can be seen with normal eyes, but not. can be seen by the partially color deficient eye.

According to Widianingsih (2010), the Ishihara color blind test application uses 38 image plates, but in our observations we only display 12 plates which are the main images of the Ishihara color blindness test. With these 12 plates, it can be concluded that the condition of the person being tested is whether they have total, partial or normal color blindness. color blindness is done in sequence.

Based on the tests that have been carried out from 200 probandus 195 or 97.5% of the probandus can read numbers and colors, 5 or 2.5% have color blindness and are part of the partial color blindness. Probandus who are included in partial color blindness cannot read the numbers and colors that appear on the test sheet in the Ishihara color blind test book number 3,4,5,6,7,8,9,10,11 and 12. The majority of errors are found in reading numbers 7,8,9,10.

The following are some plates from the Ishihara test book, where most of the probandus experienced errors in reading and the color test of writing was tested on each probandus.

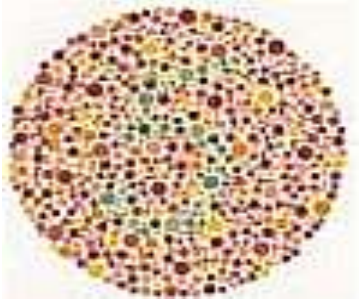

Figure 1. Plate number 7

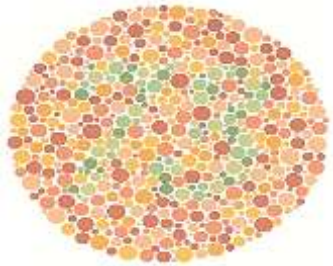

Figure 2.Plate number 8

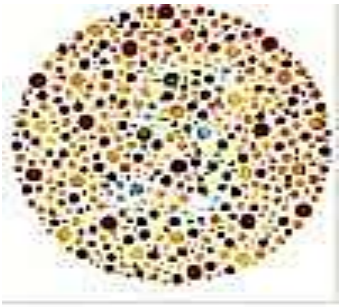

Figure 3. Plate number 9

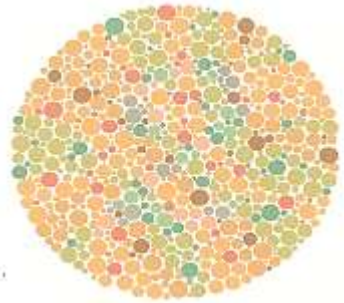

Figure 4. Plate number 10

Based on the observations made, the error in number 7 is because the actual number should be 5 but read 7. Then for error number 8, 73 should read 72. error number 9 should be number 2 but read 3. Error number 10 should be number 2 probandus cannot read and when one reads almost everything wrong. Errors made by Probandus in reading Ishihara test plates can also be caused by several things, namely heredity, lack of observations, haste and doubts in reading the plates, especially on plates number 9 and 10 and can also be caused by the printed results of the Ishihara plates. . In the writing color test, some of the probandus found it difficult to distinguish between brown and orange and some only mentioned writing not color. The number and color error values were not too large so that the result showed that 97.5% of the probandus did not suffer from color blindness. If the percent error is still below 50%, it is still normal. And if the percent error is more than 50%, it is stated to have color blindness.

From the results of the color blindness test carried out, it can be stated that 97.5% of the probandus who have been tested have normal eyes, this shows that they are able to distinguish various kinds of colors, plates and letters used as the test material, while 2.5% of the probandus have normal eyes. color blindness, but is only included in people with partial color blindness due to incorrectly mentioning some colors on the Ishihara test. Many things can cause partial color blindness, the most important factor being genetic factors passed down by parents. In the testing process it can also be a factor in determining color blindness, because many of the assistants who are tested are hasty in answering the tests carried out because they are only given 30 seconds to think about or see the plate and the color shown. Some of the probandus mispronounced the numbers on the plate and mispronounced the colors shown, many probandus only read the letters shown. Of the 2.5% probandus who stated as partial color blindness could not know the color red, and green where they called red as brown and green as blue.

In general, color blindness is caused by genes or heredity which is passed on by crossing. Where the nature of the father will be passed on to all daughters (both carriers or sufferers), and the nature of the mother will be passed on to all boys. Men are usually prone to color blindness because genes that function or are recessive color blindness are carried by the X chromosome, where men only have one X chromosome. Men also cannot be carriers because men only have one X chromosome. , whereas women are rarely color blind because women have two X chromosomes. If one X chromosome carries the c recessive gene, then the woman is only a carrier or normal carrier

(XCXc). If two X chromosomes in a woman are linked to the recessive c gene, it is called color blindness (XcXc) (Suryo, 2008).

According to Kurniadi, (2016) Color blindness is divided into 2 parts, namely total color blindness and partial color blindness, where in total color blindness a person only sees all colors as black and white, while in partial color blindness, someone has difficulty distinguishing colors. red, green and blue.PlateIshihara which is used has a dominant color between red and green so that it can only be used to determine partial color blindness to red-green. Partial color blindness to blue-yellow color will be difficult to detect from this test because Ishihara plates use very little blue and yellow.

Color blindness can occur due to hereditary factors, or because there is an abnormality in the retina, optics, and there may be disorders of the brain. The inheritance is X linked recessive. This means, it is passed down through the X chromosome. In males there is one X chromosome, so if there is an abnormality on one X chromosome it can result in color blindness. In contrast to women, who only get a recessive color blind gene from either their father or mother alone do not experience symptoms of color blindness. Color blindness in women occurs when the recessive gene is homozygous, meaning that it inherits from both the father and the mother. This explains that color blindness is almost always found in men, while women function as careers (character carriers, but not affected). In other words, the Y chromosome does not carry a color blind factor.

Color blindness occurs when the light receptor nerves in the retina of the eye undergo changes, especially the cone cells. Retinal nerve cells consist of rod cells and cones (Hilman, 2015).

CONCLUSION:

Based on the results of the discussion above, it can be concluded that most of the probandus who had been tested by the Ishihara method had normal eyes and a small proportion of prostitutes had partial color blindness.

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