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To Study the Anemic Status of Girl Students in J.D.P.S. College, Daryapur

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Abstract: ***The main aim of study focuses on experimental survey done to detect anemic status of girl students by measuring their hemoglobin percentage. Detection of total 495 girls Hb % was carried out since last two years. The Hb % of total 495 girls having age between 15-17 years showed increased but as age increases Hb % decreased. It was also noted that the number of girls living in rural areas have high Hb level as compared to girls in urban area. The result of the study is discussed in order to aware the importance of hemoglobin in girls from future point of health.***

Keywords: Age, blood samples, Sahli's hemo meter, Girls.

I. INTRODUCTION

Hemoglobin (Hgb) is the protein in blood that is rich in iron and gives it the red color. Hemoglobin concentration is expressed as g/dl. It is a conjugated chromo protein having heme as its prosthetic group. Men usually have higher level of hemoglobin than women. Hemoglobin in the blood carries oxygen from the lungs or gills to the rest of the body tissues. A healthy individual has 12 to 16 grams of hemoglobin in every 100 ml of blood. The normal adult hemoglobin (Hgb) molecule contains two alpha-globulin chains and two beta-globulin chains. In fetuses and infants, beta chains are not common and the hemoglobin molecule is made up of two alpha chains and two gamma chains. As the infant grows, the gamma chains are gradually replaced by beta chains, forming the adult hemoglobin structure, each globulin chain contains an important central structure called the hememolecule**.** Hemoglobin carries some of the body's respiratory carbon dioxide (about 20-25% of total [1]) as carbamino hemoglobin, in which CO_2 is bound to the heme protein. Normal [Hb] in blood of adults ranges 12–16 g/dL in girls and 14–18 g/dL in males; values <5 g/dL or>20 g/dL are considered critical **[2]**.Women who are menstruating or pregnant may also be at increased risk of developing anemia. The iron needs are high in adolescent girls because of the increased requirements for expansion of blood volume associated with the adolescent growth spurt and the onset of menstruation[3]. May be an indication of chronic blood loss, decreased RBC production, or abnormal destruction of RBCs (hemolysis). Hemolytic anemia may be associated with inherited blood disorders such as sickle cell disease, but can also be autoimmune in origin or result from exposure to certain drugs, toxins, infections, or transfusion of mismatched blood products **[4]**. Patients with chronic anemia and having [Hb] < 5 g/dL may experience more serious complications such as angina, congestive heart failure, heart attack and stroke **[5]**. High hemoglobin can also be caused by dehydration, smoking, or living at high altitudes, or it can be linked to other conditions, such as lung or heart disease. Low hemoglobin levels usually indicate that a person has anemia. Between 60 percent and 70 percent of Indian adolescent girls are anemic (Hemoglobin (Hb) < 12 g/dl) [6]. There are several kinds of anemia: Iron-deficiency anemia, Pregnancy-related anemia, Vitamin-deficiency anemia, Aplastic anemia, Hemolytic anemia, Sickle cell anemia. Five major surveys namely National Family Health Survey (NFHS) 2 and 3, District Level Household Survey 2 (DLHS), Indian Council of Medical Research (ICMR), Micronutrient Survey and Micronutrient Survey conducted by National Nutrition Monitoring Bureau (NNMB) were undertaken to estimate prevalence of anemia in India **[7]**. Results of this survey were dismal. As per NFHS 3 survey, about 55% of Indian women are anemic.

II. MATERIAL AND METHODS

There are seven types of methods used to detect the hemoglobin. i.e. Hemoglobincynide (HiCN) Method, Sahli's Method, Reagent-Less Method, Non- Invasive Method, Hematology Analyzer, Blood Gas Analyzer (BGA), Vanzetti's Azide Methemoglobin.

A. Collection of Sample

For the investigation 495 girls were divided according to their age and Hb %. Collection of 495 blood samples for the detection of hemoglobin was set. Hemoglobin percentage was detected by Sahli's hemometer. The tips of index finger were sterilized and pricked for collection of blood samples.

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B. Hemoglobin Checking Method

Hermann Sahli's (May 23, 1856 – April 28, 1933)[8] was a Swiss internist discovered Sahli's apparatus (1930). This is very cheap method. This method gives more reliable and accurate result.

The apparatus constitutes -Sahli's hemoglobin meter, Two Pasteur pipettes (one for HCland one for distilled water),Glass rod to stir (stirrer), N - Hydrochloric acid, Distilled Water, Comparison tube, Pipette (Hemoglobin pipette with rubber tubing and mouthpiece).

First we have added 0.1N.Hydrochloric acid (1: 10 diluted) to the hemometer tube (comparison tube) up to lowest graduation (0.02gramme). Then the fingertip was sterilized and was allowed to dry. By using sterile lancet the blood was taken out by puncturing the sterilized finger. First few drop of blood were wiped off and oozed- out blood up to 20 cu.mm (avoid air bubbles coming into a tube).Outside of the pipette was wiped off. After that the blood was transferred immediately to the comparison tube containing 2ml of 0.1N HCl. Then it was stirred. Then place the hemometer tube in the stand and allow for 5-10 minutes. A few drops of distilled water was added to the Hb tube and the mixture was stirred until the solution matches with the standard and the reading was noted. The experiment was repeated for three times.

III. RESULT AND DISCUSSION

The aim of the present study was to detect the Hb% in girls aged between 15-21 years. The number of girls, their age and hemoglobin % is shown below in the following table.

AGE / Hb %	7-8%	9-10 %	11-12 %	13-14 %
15	14	15	8	-
16	21	37	27	6
17	48	54	27	6
18	33	45	25	11
19	23	20	16	15
20	9	12	9	10
21	1	2	-	1

Table: Percentages of Hemoglobin

The highest number of girls having17 years of age found in a range of 9-10% Hb level.15 girls having 19 years of age are found in 13 to 14 % Hb level.10 girls having 20 year of age are found in 13-14 % Hb level and only 1 girl having 21 year of age was found in 13-14% Hb level. Number of girls having 13-14 % Hb level was very few.

From the above table the graph was given below.

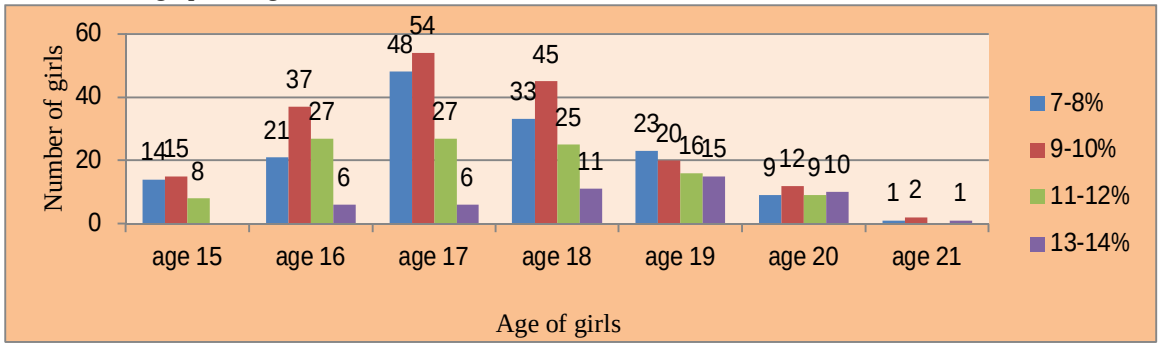


Figure: Graph showing number of girls having hemoglobin percentage according to the age

It is observed from the table that very few number of girls between 19-21 year possess 13-14% of Hb level. And girls having age between 17-18 shows 9-10 % of Hb as shown in the table. Hence it can be said that as age increases Hb level decreases in girls. And the Hb of very few girls ranges between 13 -14 Hb %. The prevalence of severe anemia was similar to that reported by Kaur S et al [9].

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The result of the study was compared with the (Comparison of the NBM 200 non-invasive hemoglobin sensor with Sahli'shemometer among adolescent girls in rural India) from the study of this research paper we observed that , In India, IDA prevalence among adolescent girls was about 56%,[10]. Which is likely to affect physical growth, psychological development, school performance and later reproductive health outcomes, particularly during pregnancy [11]. And the reference method (Sahli'shemometer) showed a high prevalence of anemia (84%) while, the NBM 200 diagnosed only 26% of participants (out of 766) as anemic. From this research papers we observed that the adolescent girls aged 13–17 years from rural India found that the non-invasive sensor NBM 200 overestimated Hb when compared with Sahli's hemometer. The sensor underestimated anemia prevalence (sensitivity 23.6%), and failed to detect severe anemia cases in their study population. From the later findings the data of 495 girls can be compared with the hemoglobin level in rural and urban areas, which is also the finding of the experimental work. In 1997, WHO convened a regional consultation of experts to address malnutrition issues among adolescent girls in South-East Asia [12].

Study and the investigations in this paper emphasizes on health awareness of hemoglobin in girls of Daryapur region in Maharashtra.

IV. CONCLUSION

The project study confirms that as the age increases, there is decrease in Hb level of girls. Very few numbers of girls possess highlevel of hemoglobin and large number of girls possessesmoderate level of Hb. Secondly it can be concluded that girls living in rural areas possess high percentage of hemoglobin than that of urban areas. The girls were made aware of complications of low Hb value in future and they were advised for the expert's opinion.

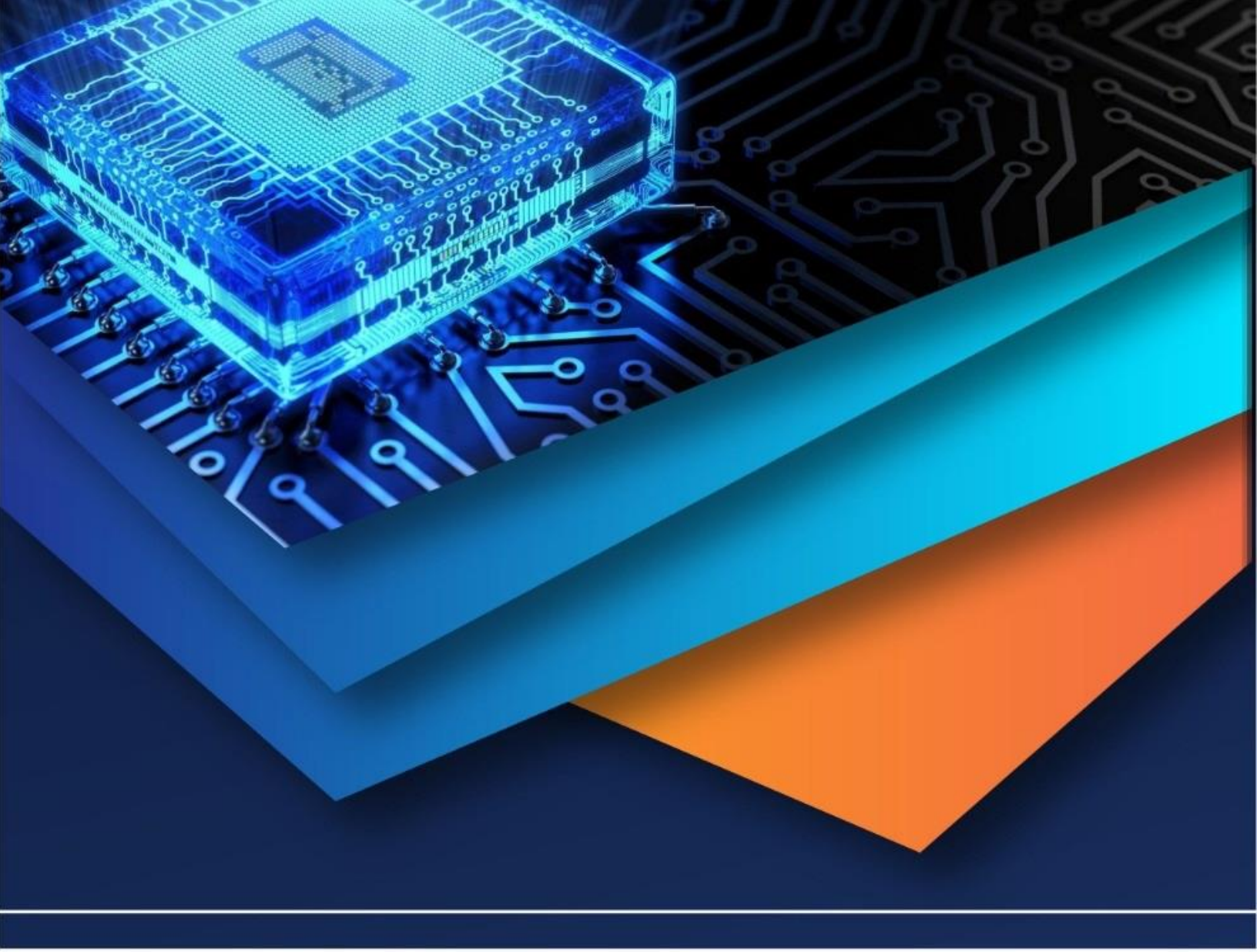
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