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# STUDY OF HAEMOGLOBIN LEVEL IN POPULATION WITH RESPECT TO THEIR AGE AND SEX FROM PUNE (M.S), INDIA

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## ABSTRACT

The hemoglobin concentration of blood is widely used in the assessment of health state. The percentage of Hb is varies depending upon the age, sex, body build and social, nutritional and environmental factors. Anemia is a condition where there is decrease in the level of Hb the the cut-off levels of Hb, which is given by WHO. In the present study haemoglobin level is estimated in different age groups in human living in urban area. The total individuals of 445 (270 male and 175 female) 60.67% and 39.32% respectively are used as sampling in this study.

The present findings reveals that the mean of heamoglobin level in different age groups in male and female as 0-19 (M,12. 9, F 13.1) 20-40 (M,15.35 F,10.9) 41-60 (M,12.45, F 10.25) 61-80 (M,10.95 F,10.25).

**KEYWORDS:** Haemoglobin level, Age groups, Human population, Pune

## INTRODUCTION

Anemia is a widespread public health problem that increases morbidity and mortality, especially among women and children (Balarajan, Ramakrishnan, Ozaltin, Shankar, and Subramanian 2011; Stevens et al. 2013). Anemia, which is defined by a hemoglobin concentration below a certain threshold, is caused by factors that affect the morphology, production, turnover, loss, or destruction of red blood cells (Balarajan et al. 2011). Although iron deficiency is considered the most common cause of anemia around the globe (Engle-Stone et al. 2017; Wirth et al. 2017), there is an growing recognition that iron deficiency is not the driving cause of anemia in all settings (Petry et al. 2016). Other major contributors include mineral and vitamin deficiencies other than iron deficiency, acute and chronic inflammation, parasitic infections, and acquired or inherited disorders (Kassebaum et al. 2014).

The multifactorial nature of anemia and the challenges in implementing interventions to address these factors have resulted in few countries being able to successfully curb the high prevalence of anemia (International Food Policy Research Institute 2016). As a result, anemia has been prioritized as one of seven nutrition indicators selected for inclusion in the World Health Assembly targets (WHO and 1000 Days 2014). Anemia data are important for monitoring progress toward meeting international goals and advocating for appropriate action in populations at greatest risk. Thus, precise, accurate, and reliable measurement is critical to inform the prevention and control of anemia.

Any person whose haemoglobin level is below 12mg / 100mL blood is considered anaemic with expectation of pregnant women. About 80% of the total anaemic cases are due to iron deficiency, and the rest are due to deficiency of nutrient like folate and vitamin B12. Folic acid and vitamin B12 are important for the production of blood cells. Man rarely suffers from iron deficiency due to poor diet. However, when new blood has to be made, the iron requirement is greatly increased. An adult woman requires 35-45 mg of iron per kg body weight or a total of 250 mg of iron. It plays a major role in the formation of hemoglobin and myoglobin. Most of the iron in the body is located in the hemoglobin of circulating red blood cells. Whereas in many normal menstruating women, almost all of the iron is in red blood cells because of their limited iron stores (Nair, 1990).

## MATERIALAND METHODS

In the present study the data of Hb (g/dl) were collected from Nidan Pathology Laboratory Pune. The total 445 (270 males and 175 females) with respect to their different age groups were selected for the study and data analysis was carried out with suitable statistical method.

## RESULT AND DISCUSSION

In the present study the quantity of Hb (g/dl) was determined. The subjects were divided into different age groups and sex. On the basis of obtained data the comparative analysis was carried out about percentage of haemoglobin between the different age groups and different sex such as male and female. The different age groups were divided in four groups. i.e., 0- 19 (159 subjects), 20 - 40 (231 subjects), 41 - 60 (41 subjects) and 61 - 80 (14subjects).Based on the sex, two groups male (270 subjects) and female (175 subjects).

| Age groups (years) | No. of investigation (n=445) | | Percentage (%) | |
|---|---|---|---|---|
| | Male | Female | Male (n= 270) | Female (n=175) |
| 0-19 | 115 | 44 | 42.59 | 25.14 |
| 20-40 | 124 | 107 | 45.92 | 61.14 |
| 41-60 | 24 | 17 | 8.88 | 9.71 |
| 61-80 | 07 | 07 | 2.59 | 4.00 |

**Table 1. Showing number of subject's investigation for Hb g/dl determination in percentage.**

| Age groups (years) | Sex | Mean Hb (g/dl) |
|---|---|---|
| 0-19 | Male | 12.2 |
| | Female | 13.1 |
| 20-40 | Male | 15.35 |
| | Female | 10.9 |
| 41-60 | Male | 12.45 |
| | Female | 10.25 |
| 61-80 | Male | 10.95 |
| | Female | 10.25 |

**Table. 2. Showing Mean Hb (g/dl) based on the Age and Sex in human population.**

**Normal Haemoglobin levels According to the World Health Organization (WHO):**

A healthy hemoglobin level depends on maintaining good nutrition and regular physical exercise. In return, hemoglobin helps you stay active by transporting oxygen through your bloodstream around your body and by removing poisonous carbon dioxide. Normal hemoglobin levels depend on your sex, age and health status.

| Groups (Years) / Sex | Normal Hb level (g/dl) |
|---|---|
| 0.6-4 | 11.0 (g/dl) |
| 5-12 | 11.5 (g/dl) |
| 12-15 | Equal/above 12.0 (g/dl) |
| Adult male | 13.8 -17.2 g/dl |
| Adult female | 12.1-15.1 g/dl |
| Pregnant women | Equal or Above 11 g/dl |

**Table 3: Normal Hb (g/dl) level given by WHO**

| Age/ gender group | Hb threshold g/dl |
|---|---|
| Children (0.5-5.0 yrs) | 11.0 |
| Children (5-12 yrs) | 11.5 |
| Teens (12-15 yrs) | 12.0 |
| Women, non-pregnant (>15yrs) | 12.0 |
| Women, pregnant | 11.0 |
| Men (>15yrs) | 13.0 |

**Table 4: Showing WHO's Haemoglobin thresholds used to define anemia.**

To relate the percentage of Hb, we take the mean Hb (g/dl) of male and female in the four different age groups. The mean Hb of the male was 15.35 g/dl and for the female it is 10.9 g/dl in the age group of 20-40 years. The male subjects have more amount of Hb (15.35 g/dl) than the female subjects (10.9 g/dl). From this findings it is said that Hb percentage is vary as per the sex. The mean Hb (g/dl) of the age group 0 to 19 yrs in male were 12.2 g/dl and in female 13.1 g/dl. The mean Hb (g/dl) of the age group 41 to 60 yrs in male were 12.45 g/dl and in female 10.25 g/dl. The mean Hb (g/dl) of the age group 61 to 80 yrs in male were 10.95 g/dl and in female 10.25 g/dl. With comparison of mean Hb (g/dl) level between these age groups it is find that the age group, 41 to 60 years having the more amount of Hb (12.45 g/dl ) than the other groups. By these observations it is said that the level of Hb (g/dl) varies depending on the age.

Most of the subjects are having the healthy level of Hb (g/dl), which is given by the WHO. But some of the peoples are having very less amount of Hb than the normal healthy Hb levels, so they were anemic patients. The anemic condition of that person are due to the improper diet.

The main reason for having less amount of Hb due to by taking improper diet and some habits, like smoking. The iron is an important component of hemoglobin, consuming iron-rich foods will increase the hemoglobin levels. The Food and Nutrition Board recommended 18 mg of iron for women and 8 mg for men),animal sources (seafood, poultry, eggs and beef),plant sources(red kidney beans, lentils, soybeans, black beans, white beans and cowpeas).

## CONCLUSION

The present study is helpful for the diagnosis that whether the patient is suffering with anemia or not. The present survey conclude that the maximum people are having healthy amount of Hb (g/dl) the limits which is given by the WHO. Some of the peoples are having very less amount of Hb they are considered as an anemic patient. There is a significant difference between the amount of Hb present in the male and female subjects and the different age groups. It is indicated that the amount of Hb is varies with respect to the age and the sex of individuals.

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