

## HEMOGLOBIN STATUS OBSERVED IN WOMEN OF AMRAVATI (MS) INDIA BY USING ANOVA TEST

Tantarpale V T, Raksheskar A. Gracy, Bahadure B. Ramesh, and P S Yenkar

P. G. Deptt.of Zoology and Deptt. of English  
Vidya Bharati Mahavidyalaya Amravati (M.S.) India  
vasudhawankhde@gmail.com

### ABSTRACT

In the present study examined the hemoglobin status in women of Amravati region and its statistical analysis by using ANOVA test. Total 298 women were tested for hemoglobin status. The one way ANOVA test was used to compare population groups, and analyzed hemoglobin %. The normal values of hemoglobin % were not observed in any age groups of total survey of women of Amravati region.

**Keywords:** Hemoglobin, Women, ANOVA test

### INTRODUCTION

Hemoglobin an iron bearing protein molecule containing within red blood cells. It performs major function which is essential to life that is 'tissue oxygen buffer' that means hemoglobin in the blood is mainly responsible for stabilizing the oxygen pressure in the tissues. It picks up oxygen from the lungs and delivers it to the body's tissue to maintain the good condition of cells. Although hemoglobin functions primarily as an oxygen carrier, it is also important in the transport of carbon dioxide and in the maintenance of the acid-base balance of the body tissues. When hemoglobin level decreases that time obesity increases in the patients and obesity decreases when hemoglobin level increases (Yong Zhang *et al.*, 2010).

Now a day a common factor affecting today's girls is the problem of dark circles below the eyes, the patchy type of skin, one of the main reason behind this is the low hemoglobin level. People do not take proper diet; illiteracy may also be the cause. Socially somewhere women are more prone so it because of Indian tradition (about eating habits). Low hemoglobin or anemia is a common condition. Among older adults, with prevalence increasing with age (Buzzle Com, 2010). Anemia is associated with increased mortality (Zakai *et al.*, 2005, Penninx *et al.*, 2006, Culleton *et al.*, 2006, Dong *et al.*, 2008) disability, and poorer physical performance (Penninx *et al.*, 2004) regardless of the underlying cause of the low hemoglobin.

High hemoglobin level is seen in smokers and in people living in high altitudes area (Right

health.com, 2000). Dehydration can also cause high hemoglobin level; it can be corrected as soon as normal proper fluid balance is restored. Other causes include; bone marrow problem and excessive intake of drug erythropoietin (Epogen) by athletes for blood doping purposes. Anemia in pregnancy remains one of the most intractable public health problems in developing countries. It is extremely common and although not always shown to have a causal link, severe anemia contributes to maternal morbidity and mortality (Usanga *et al.*, 1994, Shulman *et al.*, 1996; WHO, 2001; Crawley, 2004). Anemia, even when mild to moderate affects the sense of well-being resulting in fatigue, stress and reduced work productivity (Haas and Brownlie, 2001). Hemoglobin levels\_ In each milliliter of blood there are approximately 4.5 billion red cells and 150 milligrams of hemoglobin. The normal ranges for hemoglobin depend on the age and sex of the person.

Newborns hemoglobin level is 17-22 grams/ 100ml of blood

One month baby is 11-15 grams/ 100ml of blood

Normal hemoglobin level for men is 14-18 grams/100ml of blood.

Normal hemoglobin level for women and children is 12-16 grams/100ml of blood.

Men after middle age is 12-16 grams/ 100ml of blood

Women after middle age is 11.7-13.8 grams/100ml of blood

The aim of the study was to detect anemia especially in women of Amravati region.

## MATERIALS AND METHODS

A cross sectional study was performed. To evaluate hemoglobin status, under guidance of Doctor and medical technician, blood samples were collected from women's and hemoglobin percentage were observed with the help of haemocytometer. On the basis of three years data (2009-10, 2010-11, 2011-12), the women distributed in average age groups wise. The average age groups distributed into 20-30, 30-40, 40-50, 50-60, 60-70, 70-80 (Table 1). The one way ANOVA test was used to compare population groups. The Null hypothesis

was also used to evaluate the statistical analysis of the test.

## RESULTS AND DISCUSSION

Result of the experiment showed that, total no. of individuals is 15. And  $\sum X = 125.2$ . The common mean  $X$  of all the sample is 8.346 where as mean of sample T1 (i.e.  $X_1$ ) is 8.46, of sample T 2 (i.e.  $X_2$ ) is 8.57 and mean of sample T3 (i.e.  $X_3$ ) is 8.1 (Table 2).

We have to see whether levels of 3 different samples in comparisons to common mean  $X$  show significant variance using Null hypothesis.

**Table 1: Hemoglobin status of the women population in Amravati region (M.S)**

sr. no.	Age range	Hb% (gm) 2009-10	$X_1$	$(X_1)^2$	Hb% (gm) 2010-11	$X_2$	$(X_2)^2$	Hb% (gm) 2011-12	$X_3$	$(X_3)^2$
1	20-30	6.3-9.8	8.5	72.25	6.2-10.0	8.1	65.61	6.0-9.7	7.8	60.84
2	30-40	7.2-10.0	8.6	73.96	6.6-10.2	8.4	70.56	5.9-10.1	8.0	64.00
3	40-50	5.8-10.4	8.1	65.61	7.2-9.9	8.5	72.25	7.0-10.0	8.5	72.25
4	50-60	8.4-10.0	9.2	84.64	8.6-10.0	9.3	86.49	8.0-9.9	8.9	79.21
5	60-70	8.0-7.8	7.9	62.41				6.9-8.5	7.7	59.29
6	70-80							7.3-8.1	7.7	59.29

**Table 2: Statistical analysis of Hemoglobin levels in three different groups**

Group I	Group II	Group III
$n_1 = 5$	$n_2 = 4$	$n_3 = 5$
$t_1 = 42.3$	$t_2 = 34.3$	$t_3 = 48.6$
$x_1 = 8.46$	$x_2 = 8.57$	$x_3 = 8.1$
$S_1^2 = 357.85$	$S_2^2 = 293.95$	$S_3^2 = 393$

Calculate three sum of square

- 1) Sum of observations from all individuals from all three groups  
 $\sum x = 8.5 + 8.6 + \dots + 7.7 + 7.7 = 125.1$
- 2) Sum of square of all 15 observations  
 $\sum X^2 = (8.5)^2 + (8.6)^2 + \dots + (7.7)^2 + (7.7)^2$
- 3) Correction term  $\sum X^2/n = (125.1)^2/15 = 1043.33$
- 4) Total sum of squares =  $S(X-X^2) = 5.34$
- 5) Sum of square between groups is 1043.33
- 6) sum of square within group is 3.09

-Total sum of square = No. of observation = 15-1  
The degree of freedom (df) = 14

-Sum of squares between groups = No. of groups = 3-1

The degree of freedom (df) = 2

-Sum of squares within groups = Total sum of squares - sum of squares between groups = 12

Mean square = Sum of squares between the groups / Degree of freedom = 1.125

a) Variance (sum of squares) between the groups

b) Variance (sum of squares) within the groups = 0.2575

The results are represented in the table 3

**Table 3:** Hemoglobin status for the Analysis of variance observed in women was of Amravati region.

sr. no.	Variation	Sum of Squares	Degree of freedom	Mean square
1	Between the groups	2.25	2	1.125
2	Within the groups	3.09	12	0.2575
Total		5.34	14	

**Variance Ratio,**

$F_{obs} = \text{Mean square between groups (M.S.)} / \text{Mean square within groups (residual)}$

$$F_{obs} = 4.368$$

ANOVA results indicated that individuals in age groups 20-30, 30-40, 40-50, 50-60, 60-70, 70-80, years of age were all significantly low in served groups.

From the above result it is evident that between groups and variability is greater than the within group variability. Also all the three groups are not from population having identical means. All the data were presented as mean  $\pm$  and standard deviation ( $X \pm S$ ).

Women health hygiene is the main problem of our society. From babies to adult women they do not attention properly to their health. The basic needs does not fulfill by families. In the present

**LITERATURE CITED**

- Crawley J, 2004.** Reducing the burden of anaemia in infants and young children in malaria endemic countries of Africa: from evidence to action. *Am. J. Trop. Med. Hyg.*, **71**: 25-34
- Culleton BF, Manns BJ, Zhang J, Tonelli M, S.Klarenbach and BR. Hemmelgarn, 2006.** Impact of anemia on hospitalization and mortality in older adults. *Blood.*, **107**:3841-3846.
- Dong X, De Leon CM, Artz A, Tang Y, Shah R and D. Evans, 2008.** A population-based study of hemoglobin, race, and mortality in elderly persons. *J Gerontol A Biol. Sci. Med. Sci.*, **63**:873-878.
- Haas JD and TT Brownlie, 2001.** Iron deficiency and reduced work capacity: a critical review of the research to determine a causal relationship. *J. Nutr*; **131**: 676S-688S.
- Joan Prat, Reinald Pamplona, Albert sorribas Silvestre Mortin, Merce Vinallonga and Ramon segura, 1989.** *Metabolism, Clin. and Expt.* **38**(12), 1147-1153.
- Penninx BW, Pahor M, Cesari M, Corsi AM, Woodman RC, Bandinelli S, Guralnik JM and L Ferrucci, 2004.** Anemia is associated with disability and decreased physical performance and muscle strength in the elderly. *J. Amrican Geriatr. Soc.*, **52**:719-24.
- Penninx BW, Pahor M, Woodman RC, and JM Guralnik, 2006.** Anemia in old age is associated with increased mortality and hospitalization. *J. Gerontol A Biol. Sci. Med. Sci.*, **61**:474-9.
- Shulman CE, Graham WJ, Jilo H, Lowe BS, New L, Obiero J, Snow RW, and K. Marsh, 1996.** Malaria is an important cause of anaemia in primigravidae: evidence from a district hospital in coastal Kenya. *Trans. R Soc. Trop. Med. Hyg.*, **90**: 535-539.
- Usanga EA, Chilaka M and El Archibong, 1994.** Prevalence of iron deficiency anemia in Nigerian pregnant women. *J. Med. Lab. Sci.*, **4**: 107-113.
- World Health Organization, 2001.** Iron Deficiency Anaemia Assessment, Prevention, and Control. A guide for programme managers, WHO/NHD/01.1-188. WWW.Buzzle.com:Symptoms of low hemoglobin.html.
- Zakai NA, Katz R, Hirsch C, Shlipak MG, Chaves PH, Newman AB and MA Cushman, 2005.** A prospective study of anemia status, hemoglobin concentration, and mortality in an elderly cohort: The Cardiovascular Heal. *Arch. Int. Med.*, **165**:2214-2220.

study all the age groups women showed anemic condition similar finding by Barrett –connor *et al.*, 1987, Joan Prat 1989.

Iron deficiency is the main reason of lower hemoglobin in women. About the balanced diet unconsciousness among women is another reason. Similar investigation by Kiwanuka *et al.*, 1999, Nils milman *et al.*, 2000.

Also observed that lack of scientific knowledge about Hemoglobin. Nutritional problems observed in each age group of total women are served. Nutritional deficiency were indicates Anemia in all served groups.

From the above results, we focus in future research is needed to determine the effectiveness of educational programmed involving all age women, children and parents. Also the distribution of multivitamin for the low income populations. Similarly awareness programs arrange in economically backward areas.