ORIGINAL ARTICLE

A Comparative Study of Hemoglobin Levels in the blood of male and Female Individuals Facing Iron-Deficiency Anemia

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ABSTRACT

The main objective of this study was to determine the pattern of iron-deficiency anemia among male and female individuals due to malnutrition. Current study was conducted in Jinnah hospital Lahore. There were total 120 individuals; 20 males and females were in group A.50 anemic male and 50 female individuals were in Group B and Group C respectively. Results were significant P<0.001and a remarkable changes have seen in Hemoglobin levels and serum ferritin levels in anemic male 7.20±5.6 mg/dL, 140.110±13.51ng/mLand in female 9.10±13.2 mg/dl,80.13±23.41ng/mL respectively. Current study highlights significant iron-deficiency anemia in male individuals.

Keywords: Hemoglobin, anemia, iron deficiency

INTRODUCTION

Anemia is a biological disorder in which normal hemoglobin levels become decreased by number of reasons.There are many types of anemia produced by different causes. Based on morphology of red blood cells hematologists tend to categorize anemia as microcytic, macrocytic or normocytic (Bergeron et al., 2005). There are number of causes of anemia but more common are due to nutritional deficiencies or presences of antagonists like drugs. Genetic problem in absorption of iron like due to certain mutation also a cause of anemia in this condition body cannot absorb iron (Bodnar et al., 2002).Blood loss causes both internally or externally can cause anemia. Similarly genetic disorders of hemoglobin synthesis and erythropoiesis are inhibited by immune mechanisms or erythropoietin deficiency may cause anemia. Sometimes unbalanced endocrinal secretions may lead to anemia (Ramakrishnan et al., 2002). Different medicines, radiotherapy, chemotherapy, toxicity because of heavy metal certain viral infections can also produce anemia.

Nutritional anemia is an abnormal biological problem in which red blood cells count of the body decreased because of malnutrition especially by the poor supply of iron, folic acid and Vitamin B12. Common examples of nutritional anemia are Iron deficiency anemia and pernicious anemia. Fatigue, Hair loss, constipation, sleepiness, tinnitus, palpitations, fainting or feeling faint, breathlessness, twitching muscles etc. are all indications of anemia. If anemic condition is not managed properly than chronic anemia may leads to other organ involvement like heart failure, hepatosplenomegaly and neurological or psychomotor disorder (Larade and Storey, 2004).

When the quantity of mineral iron in the body decreased than Iron-deficiency anemia occurs. Iron is the basic and important constituent of the hemoglobin biosynthesis in the bone marrow. Hemoglobin is a transporting protein of blood and it supply oxygen to the all organs of the body. Lack of sufficient amount of iron, the body cannot biosynthesis required quantity of hemoglobin for red blood cells. The result of such mineral iron deficiency caused iron-deficiency anemia (Guyatt et al., 1990).

MATERIAL AND METHODS

The current study was conducted in different departments at Jinnah Hospital Lahore in a period of one year from June 2015 to June 2016. In this study 120 male and female individuals were selected,admitted in wards. These individuals were divided into three different groups. In Group A there were 20 control individuals 10 were males and 10 were females. Similarly in Group Btotal 50 individuals were male while in Group C 50 individuals were female respectively. These individuals were further evaluated through a detailed medical history and noted any bleeding from any site like bruising, petechialmelena, hematemesis etc. Special thing which was noted that was nutritional and calories intake. Blood samples were taken into different containers. Two variables, measurement of hemoglobin and serum ferritin levels were determined. Colorimetric measurement method is adopted for different variables in this study. Data was analyzed by using SPSS software. Mean and standard deviation for the Quantitative variables were calculated. P value of < 0.05 was considered as significant.

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RESULTS

Total 120 individuals were selected for this study and presence of anemia was observed during the study period. In control Group A, there were 20 individuals out of them 10 were male and 10 female; their hemoglobin levels were 16.30±23.6, 13.30±19.3. In Group B 50 female and in Group C 50 male individuals were Anemic. A significant change P<0.01has seen in the hemoglobin levels of Anemic females and males 9.10±13.2, 7.20± 5.6 respectively.

The ferritin test measures the level of ferritin, the major iron storage protein in the body. Low levels of ferritin indicate iron deficiency in the body, which causes anemia. The Serum ferritin levels of female and male in Group A, Group B and Group C were 160.230±123.61, 200.130±123.41, 80.13±23.41, 140.110±13.51 respectively. A significant change P<0.01 has seen in the Serum ferritin levels of Anemic females and males.

Table 1: (control individuals) n= 10 female

Variables	Mean + SD	Significance
Hemoglobin gm./dL	16.30±23.6	P<0.01
Serum ferritin levels ng/mL	200.130±23.41	P<0.01

Table 2: (control individuals) n= 10 male

Variables	Mean + SD	Significance
Hemoglobin gm./dL	13.30±19.3	P<0.01
Serum ferritin levels ng/mL	200.130±23.41	P<0.01

Table 3: (Anemic individuals) n= 50 Female

Variables	Mean + SD	Significance
Hemoglobin gm./dL	9.10±13.2	P<0.01
Serum ferritin levels ng/mL	80.13±23.41	P<0.01

Table 4: (Anemic individuals) n= 50 male

Variables	Mean + SD	Significance
Hemoglobin gm./dL	7.20± 5.6	P<0.01
Serum ferritin levels ng/mL	140.110±13.51	P<0.01

DISCUSSION

Anemia in all age groups is of immense public health significance. It is the commonest problem with global prevalence of 30% i.e., 1500 million people all over the world. The nutritional anemia has major consequences not only on the morbidity and mortality in people but also effects on intellectual development(Cook, 2005). In both developing and non-developing countries Iron-deficiency anemiais every serious public health problem (Janz, et al., 2013).The current study described that males are also suffering from anemia like female. The finding of this study has a correlation with other studies. According to Hollowell et al., 2005, the frequency of anemia was high in under nourished people.

Ioannouet al., 2002 stated that each hemoglobin molecule contains four globulin chains and each chain has an important iron-containing porphyrin ring termed heme. Heme compound is an iron atom that is vital in transporting oxygen and carbon dioxide in our blood. The iron contained in hemoglobin is also responsible for the red color of blood. According to Rockey and Cello 1993, Ferritin is a globular protein complex consisting of 24 protein subunits and is the primary intracellular iron-storage proteinFerritin serves to store iron in a non-toxic form, to deposit it in a safe form, and to transport it to areas where it is required.

In the present study it has concluded that anemia is a major health problem in this part of world where there is high prevalence of malnutrition. As anemia remains a major health burden, delay in diagnosis, institution of inappropriate therapy, ongoing infections, severe malnutrition and lower socioeconomic status can be associated with significant morbidity and mortality and this may significantly increases the risk of adverse outcome (Algarin et al.,2003). It has been seen that nutritional deficiency especially iron deficiency anemia is major cause of anemia in our population.

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