Variation in Blood Values and Haemoglobin Levels in Day Scholars and Boarders

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Haemoglobin levels were estimated in 260 student (girls & boys) grouped equally as Day Scholars and Boarders studying in various departments of Sindh University Jamshoro. Highly significant differences in haemoglobin levels were observed between day-scholars and boarders both (girls & boys). Blood investigation were carried out to check out percentage of haemoglobin and also blood values. Anaemia was suspected in 28 cases in Day Scholars, despite the red cell count and erythrocyte indices (MCV, MCH and MCHC) were within the normal limits. Sixteen cases of anaemia were detected in the boarders and red cell counts are near lower limit of normality. The blood smear showed slightly microcytic hypochromic picture further confirmed by erythrocyte indices.

The present study was undertaken to estimate haemoglobin levels and to calculate erythrocytes in Day Scholar and Boarder students in order to evaluate our own standards and also to detect the presence of anaemia amongst the students. Further study is proposed to investigate in the stressful condition persists among group of same age and also further studies should be undertaken among the students in order to detect and remove the cause of anaemia.

Key words: Haemoglobin, erythrocyte, investigation

The study of haemoglobin has been of major importance in biology and medicine because haemoglobin play an important role in integrating biochemical process in our body[1]. Anaemia is a condition in which you have a lower level of red blood cells than normal or a decrease of haemoglobin and the number of red cells, or a decrease of haemoglobin alone (Muller, 1953) is a condition known as 'Anaemia'[2]. Red blood cells contain haemoglobin, which carries oxygen from your lungs to the rest of your body. If haemoglobin levels are low, then the body tissues won't be getting enough oxygen and subject will feel tired and lacking in energy . Viteri and Tours[3] reported that even mild anaemia could decrease performance in exercise and impair normal working capacity[4]. The haemoglobin level has employed a prime arbiter in the diagnosis of anaemia[5]. The red cell count does provide an alternate means of assessment but it can be in the normal range of the people who are anaemic[1]. Haemoglobin consists of a basic protein globin and the iron-porphyrin complex haem. Each molecule of haemoglobin consists of two pairs of globin chains to, each of which are attached one haem group and the molecular weight of the entire molecule is 64,458[6]. Haemoglobin, a chromoprotein found in the RBCs and having a great affinity for oxygen (O_2) is the main component of red blood cells[7]. Haemoglobin iron constitutes approximately 60-70% of the total body iron[8]. The iron containing pigment of red blood cells, function is to carry oxygen from lungs to the tissues (Muller 1953) or haemoglobin is a substance in the erythrocytes, which carries the oxygen[2]. The amount of haemoglobin (Hb) in blood average 14 to 16gms/100ml. In female it ranges between 12-16gms/100ml., i.e., 14.0 ± 2.5g/dl, while in male it ranges between 14 to 18gms/100ml i.e. 15.5 ± 2.5

gms/100ml[2,9].One gram of haemoglobin can combine with 1.34ml of oxygen (O_2), the resulting compound is known as Oxyhaemoglobin[8]. From a glance at the literature it becomes quite evident that iron deficiency still remains to be the commonest cause of anaemia in most parts of the world and in developing countries prevalence of iron deficiency anaemia in women and preschool children is 20-60%[10,11]. Inadequate iron intake, increased physiological demands, high consumption of inhibitors of iron absorption, parasitic infections can be the cause of iron deficiency anaemia. According to a WHO report there is a relationship between iron deficiency and mental performance in children in both developed and under developed countries (1968)[12]. The present survey was undertaken to estimate Hb levels in day scholar and boarder students in order to evaluate our own standards and also to detect the presence of anaemia amongst the students.

Subjects and Methods

The study was carried out in the Department of Physiology, University of Sindh Jamshoro. One hundred and sixty girls and one hundred boy students of various classes and also of various departments (day scholars and boarders) were included. Apparently, looking healthy and their haeart status was sound. The population sampled was confined to young adults of age between 18 to 23 years. Haemoglobin levels were determined by Sahli's method (Sahli's haemoglobinometer, superior-Germany). Blood smears were prepared using Leishman's stain. Only for haemoglobin levels of 10gm/dl and below were examined for the red blood cells morphology. The following

investigations were carried out as a routine procedure; total red cell count, PCV, MCV, MCHC and MCH, peripheral blood smear were prepared for detecting degree of for detecting. Degree of hypochromia, and micocytosis, macrocytosis, anisocytosis, poikilocytosis, target cells etc.

Results

Comparison of mean values of haemoglobin between day scholars and boarders both girls and boys was carried out. Table 1 shows blood haemoglobin levels in girls (day scholars and boarder) i.e. mean percentage of haemoglobin comes out to be 9.33±1.5 respectively with range of 4.8gms/dl to 14gm/dl. In group 1 and range of 6.5gms/dl to 12.2gms/dl in group 2. While table 2 shows comparison between the boys (day scholars and boarders mean haemoglobin % in group 1 is 11.55±2.63 and in group 2 is 12.208±2.134. The range between two groups is 6.8-16gms/dl and 7.2-17gm/dl respectively. Highly significant mean difference was observed in two groups at P value=0.0005. Anaemia was suspected in 28 cases in day scholars, despite the red cell count and erythrocyte indices (MCV, MCH, and MCHC) were within the normal limits. Sixteen cases of anaemia were detected in the boarders. Red cell counts were near lower limits of normality. The blood smear showed slightly microcytic hypocromic picture, further confirmed by erythrocyte indices.

Table 1. Blood haemoglobin levels in gms/dl l(girls)

Groups	Mean±SD	P-value
Day Scholars (Group 1) n=80	9.33±2.146	0.0005
Boarder (Group 2) n=80	9.67±1.584	

Range Group1=4.8gms/dl to 14gms/dl
Range Group 2= 6.5gms/dl to 12.2gms/dl

Table 2. Blood haemoglobin levels in gms/dl (Boys)

Groups	Mean±SD	P-value
Day Scholars (Group 1) n=50	.11.55±2.6321	
Boarder (Group 2) n=50	12.208±2.134	0.0005

Range Group1=6.8gms/dl to 16gms/dl
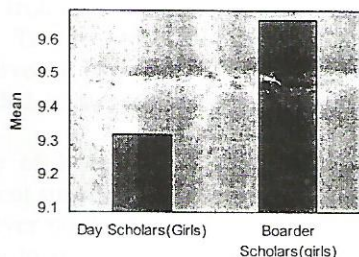Range Group 2= 7.2gms/dl to 17gms/dl

Fig. 1. Mean haemoglobin percentage between boarders and day scholars (Girls)
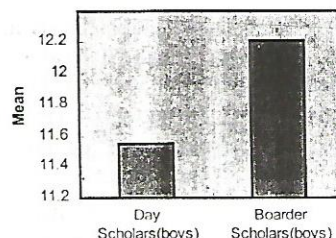

Fig. 2. Mean haemoglobin percentage between boarders and day scholars (Boys)

Discussion

Normal levels of haemoglobin and haemotological indices can be found in any standard text book mainly for western countries. Unfortunately for eastern countries especially for (Indo-Pak) such type of literature is either deficient or neglected due to less research work. In developing countries such as in Pakistan especially with reference to rural areas the situation is serious and critical. Our study deals with such type of areas, where students are from both (urban & rural), those living in hostels (rural) and day scholars from Hyderabad city and from surrounded villages where transport is problem. The results shows the difference between haemoglobin values and other haematological incides. The burden of studies, the variable meal timings, ignorance towards health exist in the University students, especially in group of day-scholars in comparison to boarders. Apparently difference was expected in boarders due to home sickness etc but as day-scholars are most of the time under tension which affect directly on their health, e.g. poverty, socioeconomic conditions of parents, large size of family members and especially problems of safe student transport. These reasons among boarders might be due to different circumstances related to health, as they have no habit of exercising or they do very little which can cause immediate reduction in levels of haemoglobin. And also they may not keep themselves in stressful conditions. Socioeconomic relief also has helped them. Better socioeconomic conditions may also not only keep them away from stressful conditions but can have better nutrition thus their haemoglobin values are better than others. However, further study is needed to investigate prevalence of fundamental health problems affecting on different groups.

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