



Clinical Research

ANALYSIS OF HEMOGLOBIN LEVELS AND RBC INDICES AMONG THE DEFERRED BLOOD DONORS- EXPERIENCE IN A TERTIARY CARE HOSPITAL IN CHENNAI.

V. Lingesh Kumar Saveetha Medical College, Chennai, Tamil Nadu, India

Hema Malini* Dept Of Pathology, Saveetha Medical College, Chennai, Tamil Nadu, India
*Corresponding Author

ABSTRACT **BACKGROUND:** Donor deferrals are the major causative factor of temporary donor rejection which is preventable and treatable. A basic knowledge about frequency, types, and the severity of variant hemoglobin with RBC indices among deferred blood donors will help to plan a strategy to promote donor recruitment and in overall national health.

OBJECTIVE: The retrospective study of comparison of hemoglobin levels in deferred blood donors with their blood indices.

MATERIALS AND METHOD: The retrospective analysis of deferred blood donors of Saveetha Medical College, Chennai was conducted. The data's were extracted from donor register and analyzed. The Study is on 6 months deferred blood donors. Donor's samples were analyzed on an automated hematology analyzer.

RESULT: Overall a list of 50 donors were taken from blood bank, out of which 48 were deferred which makes the deferral rate more predominant and it differs at various age groups. The donors are deferred mainly based on criteria of mcv value and hemoglobin levels. The deferred donors are majorly seen at the age group of 21-25 years (22.46%), secondly donors below 20 years (15.31%), between 26-30 years (5.10%), 31-35 (4.8%), and above 35 years its (2.4%)

CONCLUSION: High prevalence of anemia among blood donors signifies deteriorating health status not only in donor population but also in general population. This situation calls for more concerted efforts as otherwise it would lead to decreased blood donor pool.

KEYWORDS :

INTRODUCTION

The primary responsibility of blood transfusion service (BTS) is to provide a safe and sufficient supply of blood and blood components to those in need. In fulfilling this responsibility, BTS ensures that the act of blood donation is safe and causes no harm to the donor. It builds and maintains a pool of safe, voluntary non-remunerated blood donors and takes all necessary steps to ensure that the products derived from donated blood are efficacious for the recipient with a minimal risk of any infection transmission or any other abnormalities in blood that could be transmitted through transfusion to the recipient.

Usually before donation the donor is subjected to questionnaire, physical and hemoglobin examination to qualify as blood donors. Based on the above findings, the BTS will segregate a list of voluntary donors as deferred blood donors. Deferred blood donors are those individuals who are not eligible to donate based on criteria used to protect the health and safety of both donors and transfusion recipient. These donors may be deferred at any point during the collection and testing process. The criteria for prospective blood donor selection and deferral in India are provided by the drugs and cosmetic act 1940 (and rules there under) supplemented by the standards for blood bank and blood transfusion service.

The deferral criteria used for classifying the cause of deferral are in categories 1,2,3,4.

- 1) Donors whose own health might be affected by donating (category 1)
- 2) Donors with risk of transmitting transfusion transmissible infection (category 2)
- 3) Donors with a condition where transmissibility by blood is unknown or donors with disease or a condition not suitable for blood donation (category 3)
- 4) Sensitive physical and social considerations making donors non suitable for blood condition (category 4)

METHODOLOGY

This study took retrospective approach in analyzing data of deferred blood donors to evaluate their hemoglobin levels in Saveetha Medical College and Hospital. Our blood bank comprises experienced Faculty, well skilled Technologists and high tech equipment.

Basic demographic details including Name, Age, Sex and type of blood donor were taken into account. Testing of blood was done by Automated Hematology Analyzer. Donors were deferred if hemoglobin is less than 12.5g/dl or more than 18g/dl. The results were entered in a spread sheet and used for analysis.

DISCUSSION

Deferring or rejecting blood donors often leaves the person with negative feeling about themselves as well as the blood banking system. The causes of deferral can be broadly classified into temporary and permanent. This study has taken blood donors who have been deferred in the last 6 months. Generally, more number of deferral was for temporary reasons constituting about 84% and 16% were for permanent reasons. The most common cause for deferral is due to low hemoglobin levels (anemia). This is more prevalent among females than males. In India for both male and female the required hemoglobin levels are 12.5mg/dl in which more than 7% of blood donors do not meet their minimum hemoglobin standard.

Table -1: Analysis of the type of anemia among the deferred blood donors.

Sl.No	No of Donors	Avg. MCV	Type of Anemia
1.	48.	68.3	Microcytic Anemia
2.	2.	84.4	Normocytic Anemia

The common cause of anemia is Iron Deficiency. This could be a result of poor nutritional status (inadequate consumption of iron containing diet, folic acid and vitamin B12). In some cases previous donations may also be a factor. Each Blood donation causes a depletion of 236 mg of iron which has to be replenished by diet in the post donation period. Various other factors affect the hemoglobin levels which results in deferral of blood donors, like demographic variables such as gender and age which has been shown to be independently associated with hemoglobin deferral in a study that made use of 7,15,000 donors. The study showed the female possesses 11 times greater chance of being deferred than males. Smoking status of a person is also a factor in increasing the risk of deferral blood donor.

Table 2: Analysis of Hemoglobin levels among the deferred blood donors.

Hemoglobin levels	Both (Male and Female) (n=50)	Male (n=22)	Female (n=28)
Average	10.9	11.4	10.4
Maximum level	12.4	12.3	12.4
Minimum level	6.2	8.6	6.2

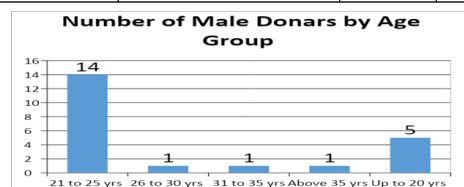


Fig 1: Deferred Male blood donors according to Age group. (n=22)

This study analyses particularly the hemoglobin values of deferred blood donors, which is a total of 50 among which 48 of them had microcytic hypo chromic anemia with an average of 68.34%. Among those 50 donors there were 22 males and 28 females. On analyzing only the male donors, the maximum number of donor deferral rate lies between the age group of 21-25 years. The second prone categories of people lie between the age group of up to 20 years. The reason for temporary deferrals are mainly due to alcoholism, smoking, underweight and recent donation.

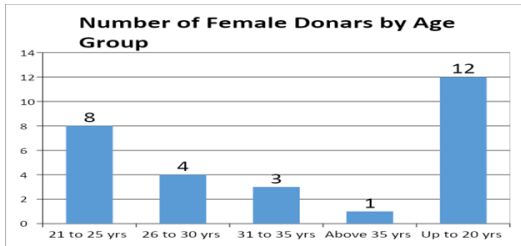


Fig 2: Deferred Female blood donors according to Age group.(n=22)

In case of female who are more in number ,the most prone category of age group are up to 20years and second most prone category are between 21-25 of age group. The least affected group of donors are those who are above 35 years of age. Here the most common cause of deferral is due to anemia (iron deficiency anemia). This is due to decrease in ferritin levels in blood which is a measure of the body's iron store. These temporary deferrals can be due to continuous loss of blood in menstruation, pregnancy.

RESULT

A total of 50, deferred blood donors, were taken into my study who were listed under deferred donors for the past 6 months. Out of which 48 had microcytic hypo chromic anemia whose MCV was 68.3 and 2 of them are Normocytic whose MCV was 84.4. As per the analysis, out of 50 people who were deferred 22 were males and 28 were females. All of them were temporary deferrals .Overall, women had higher deferral rate than men in our region. Analysis of hemoglobin levels showed the average Hb levels for both the sexes were 10.9, which incurs a moderate level of deferral rate. The most common cause among temporary deferral was due to anemia especially among females (hb<12.5%). Among females the most affected group is between the age group of 20 years. Whereas in males most deferred blood donors are in between 21-25 years. If we further extend our study we can also find about the iron status of each individual which is even more specific about anemic status. On analysis of both the sexes majority of deferred blood donors fall under age category of 21-25 years (44%). second majority group fall under category of up to 20 years (34%)

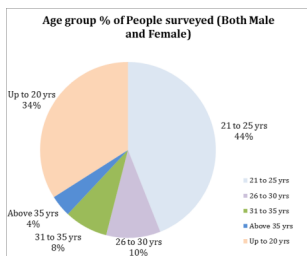


Fig 3: Deferred blood donors according to Age group.(n=50)

CONCLUSION

Blood donors are deferred due to low hemoglobin, which is largely attributed to Microcytic Hypo chromic anemia. This study highlighted the importance of hemoglobin levels in them. Analysis of deferral pattern may help the doctors and blood banks to get more focused in donor screening. So temporarily deferred donors must have proper follow up and management so that this will not lead to diminished supply of donors in future. The deferred donors should be given proper treatment management to overcome their problems and move out from non-donors to permanent donors. So the health policies need to be revised to determine the rate and causes of donor deferral for the safety of blood transfusion for national welfare. By this we can prevent the loss of precious blood and its components at local and national levels.

REFERENCE

1. Evaluation of blood donor deferral causes: a tertiary care center based study Rehman,

Suhailur, et al. "The evaluation of blood donor deferral causes: A tertiary care centre-based study." *J Blood Disorders Transf* 3.5 (2012): 131.
 2. Insight into donor deferral pattern based on peripheral blood counts: an experience from south Pakistan. Sultan, Sadia, et al. "Insight into donor deferral pattern based on peripheral blood counts: An experience from South Pakistan." *Asian journal of transfusion science* 11.2 (2017): 151.
 3. Risk factors for deferral due to low hematocrit and iron depletion among prospective blood donors in a Brazilian center. Dauar, Eloísa Tedeschi, et al. "Risk factors for deferral due to low hematocrit and iron depletion among prospective blood donors in a Brazilian center." *Revista brasileira de hematologia e hemoterapia* 37.5 (2015): 306-315.
 4. Demographic correlates of low hemoglobin deferral among prospective whole blood donors. Mast, Alan E., et al. "Demographic correlates of low hemoglobin deferral among prospective whole blood donors." *Transfusion* 50.8 (2010): 1794-1802.
 5. Etiology of anemia of blood donor candidate's deferred by hematologic screening. Silva, Michel Alves da, et al. "Etiology of anemia of blood donor candidates deferred by hematologic screening." *Revista brasileira de hematologia e hemoterapia* 34.5 (2012): 356-360.
 6. Pre-Donation deferral of blood donors in South Indian set up: an –analysis Sundar, P., et al. "Pre-donation deferral of blood donors in South Indian set-up: An analysis." *Asian journal of transfusion science* 4.2 (2010): 112.
 7. A prospective study evaluating the lowering of hemoglobin standards for blood donors. ALI, ANITA M., et al. "A prospective study evaluating the lowering of hemoglobin standards for blood donors." *Transfusion* 29.3 (1989): 268-272.