

## Blood Donor Deferral due to Anemia - A Study in the Blood Bank of a Tertiary Care Centre in Coastal South India

Galina D'Souza\*, Kirana Pailoor\*\*, Murali Keshava S.\*\*\*

### Abstract

**Background:** Blood donors are deferred from donating blood for several reasons, either permanently or temporarily. Anemia is a major cause for temporary deferral among donors. The aim of our study was to find the incidence of deferred donors due to anemia and to analyse the most common blood group deferred due to it. **Materials & Methods:** A retrospective study was done from January 2012-June 2012, in order to study the rate of deferral due to anemia in Father Muller Medical College Hospital Blood Bank. Data was collected by reviewing the deferred donor records over the six months period. It was analyzed by frequency and percentage. **Result:** Out of 3354 donors over six months period, 559 were deferred (203 females, 356 males). Of these 144 were deferred due to anemia (137 females, 7 males). The most common cause of deferral in women was due to anemia, accounting for about 67.48% of deferral in females which is in accordance with the literature available. It was seen that donors with A<sup>+</sup>ve blood group were mostly deferred. **Conclusion:** Donor deferral can be reduced by creating awareness, health education and also by administration of Iron -Folic acid supplementation.

**Keywords:** Anemia; Donor deferral; Blood donor.

### Introduction

The paucity of healthy donors has always been a serious problem for blood banks.[1] Blood transfusion saves life and improves health. The requirement in India per year is 10million units, against the donated blood which is only 7.4 million units.[2] Individuals disqualified from donating blood are known as deferred donors. The rate and reason of deferral differ from region to region and one centre to another. Deferral is a painful and sad experience for blood donors as well as the transfusion centre.[3] Donor deferral should neither be too restrictive nor liberal as it is

important to have adequate stock of blood and its components on one hand and on another hand safety of donor and recipient.[4]

Deferrals can be characterized as temporary/short term (1-56 days), long term (57-365 days) & permanent (>365 days). A majority of donor population in India are deferred due to Temporary but easily correctable causes such as anemia. Causes of anemia could be due to nutritional deficiency anemia due to blood loss, anemia due to chronic diseases and so on. Nutritional deficiency is of highest prevalence in India i.e. Iron deficiency anemia. It may be due to inadequate intake or poor bioavailability of dietary iron. The health of such individuals is compromised making it the reason for deferral.[5]

In this study we aim to assess the incidence of donor deferral due to anemia and also the most common blood group deferred due to anemia.

**Authors affiliation:** \*Second year MBBS student, Father Muller Medical College, Mangalore, Karnataka, India. \*\*Associate Professor, Dept. of Pathology, Father Muller Medical College, Mangalore, Karnataka, India.\*\*\*Assistant Professor, Dept of Paediatrics, Kasturba Medical College, Mangalore, Karnataka, India.

**Reprints requests:** Dr.Kirana Pailoor, Associate Professor, Dept of Pathology, Father Muller Medical College, Mangalore, Karnataka, India.

E-mail: dockirana@yahoo.co.uk

## Materials and Methods

Ethics approval for this study was taken from the ethics committee of our college and a retrospective study was conducted. Data from January 2012 to June 2012 was taken for the study. A total of 3354 donors came to the blood bank during the period. Detailed medical history was taken and donor questionnaire form had to be filled in which prospective donors were asked questions about the past medical history of infection, recent surgeries, medication, smoking, and previous blood donation were taken. In females, the regularity of menstruation was also asked. Blood groups also had to be written down.

Those fit on initial interview, were examined based on the hemoglobin, blood pressure and pulse. The hemoglobin cut off was set at 12.5gm for both male and females. Finger prick blood was taken and hemoglobin estimation was done by Hemocue - Hb201+ ( Hemocue AB , Angelholm , Sweden ) and the data was analyzed by frequency and percentage

## Results

Out of the 3354 voluntary donors, 559(16.6%) were deferred, of which 203 were females and 356 males (Table 1). Of these 559 donors who were deferred, 144 (25.7%) were deferred due to anemia alone, that is 137 (67.48%) were females and 7 (0.019%) were

**Table 1: Showing donors deferred over a period of six months**

Total Donors In 6 Months Duration	Deferred	Percentage
3354	559	16.6%

**Table 2: Showing gender distribution among deferred donors and donors deferred due to anemia**

	Females	Males	Total
Deferred due to anemia	137 (67.48%)	7 (0.019%)	144 (25.7%)
Deferred due to other causes	66	349	415 (74.3%)
Total	203	356	559

**Table 3: Showing most common blood differed due to anemia among both genders**

Blood Group	Males	Females	Total
AB <sup>+ve</sup>	-	12	12
A <sup>+ve</sup>	2	44	46
B <sup>+ve</sup>	1	19	20
O <sup>+ve</sup>	1	27	28
AB <sup>-ve</sup>	-	1	1
A <sup>-ve</sup>	-	3	3
B <sup>-ve</sup>	-	3	3
O <sup>-ve</sup>	-	3	3
Unknown	3	25	28

males (Table 2).

All donors deferred due to anemia presented with mild anemia i.e. ranging between 10.5-11g% and the morphologic type seen was Microcytic Hypochromic.

It was also seen that maximum number of donors deferred due to anemia belonged to A<sup>+ve</sup> blood group, both in males and females (Table 3).

## Discussion

In this study, we analyzed donor deferral patterns due to anemia and a possible correlation between anemia and blood groups. Blood donation programme is the life - force of any blood bank and hospital.[6] Safe donor selection is the first step towards safe transfusion services.[6] There can be various reasons for deferral such as hypertension, diabetes mellitus, chronic liver disease, heart disease, chronic kidney diseases and so on.

Hemoglobin assessment is an important criterion for blood donor selection. The minimal cut - off is set at 12.5g% hemoglobin content in the donated unit. A healthy blood donor

**Table 4: Showing comparison of various studies**

Studies Conducted	Place	Percentage deferred due to anemia
BahadurS <i>et al</i> [5]	New Delhi	15.5%
KhanS <i>et al</i> [4]	Pakistan	13.33%
Unnikrishnan B <i>et al</i> [7]	Manipal	12.34%
Chaudhary RK <i>et al</i> [8]	Lucknow	18.6%
Bashwri L[9]	Saudi Arabia	15.5%
Sareen R <i>et al</i> [10]	Jaipur	39.42%
Kulkarni N[11]	Bellary	34.31%
Radhiga ST <i>et al</i> [12]	Chennai	30.97%
Girish CJ <i>et al</i> [2]	Shimoga	19.45%
AwasthiS <i>et al</i> [6]	Moradabad	33.5%
Rabeya Y <i>et al</i> [13]	Malasyasia	40.7%
Agnihotri N[14]	Pune	55.8%
Jashnani KD[8]	Mumbai	27.5%
<b>Present study</b>	<b>Mangalore</b>	<b>25.7%</b>

loses about 200-250 mg of Iron per unit of donated blood.[5] Despite efforts by our government towards reducing anemia due to nutritional deficiency, it is still very common in our country. Hemocue is a portable equipment that is able to spectrometrically determine hemoglobin. It uses 10 µl of blood capillary absorbance of azidemethemoglobin using a cuvette containing a dry reagent system and a dual wavelength photometer, it is more accurate than microhematocrit.[1]

Various reasons are cited for lower number among females such as fear of blood donation, lack of awareness and motivation among females about the importance of blood donation and so on.[2]

Studies conducted by Bhadur S *et al*[5], Khan S *et al*[4], Unnikrishnan B *et al*[7], Chaudhary RK *et al*[8], L Bashwri[9] and Girish CJ *et al*.[2] All had a deferral rate much less than ours whereas Sareen R *et al*[10], Kulkarni N[11], Awasthi S *et al*[6], Radhiga ST *et al*[12], Y Rabeya *et al*[13] and Agnihotri N[14] had a much higher deferral rate (Table 4).

In our study females deferred due to anemia was 67.48%. This was similar to a study done by Y Rabeya *et al*[13] and Bahadur S *et al*[1], where it was found to be 69% and 74.1% respectively, it is in contrast to the studies by Bahadur S *et al*[5] and Kulkarni N[11] who had a deferral rate of 34.2% [5] and 43.96%

respectively. The males deferred due to anemia was less than 1%.

All of the deferred donors in our study presented with mild anemia ranging between 10.5-11 g% and had Microcytic Hypochromic morphology on blood smear, which is in contrast to the study conducted Bahadur S *et al*[5] in which the majority of them had a normocytic normochromic morphology on blood smear.

In case of blood Groups, it was seen that maximum number of donors deferred due to anemia had A<sup>+ve</sup>, followed by O<sup>+ve</sup>. It was seen that Rh<sup>-ve</sup> blood group had a lower deferral rate, probably due to lower percentage of population having Rh<sup>-ve</sup> type of blood group. However on thorough literature search, hardly any studies on prevalence of blood group amongst deferred donors were available.

It has been suggested that hemoglobin standard must be lowered to increase female eligibility.[9] The deferral of donor due to any reason has a negative impact and many temporarily deferred potential donors do not return to donate in the future. These Anemic donors should be informed, referred for further work up, treated appropriately and motivated to return for blood donation, thereby improving the public health and also decreasing the donor deferral due to anemia.[5,12,15,16] Health authorities should implement policies for preventive measures to

decrease the deferral as it indirectly reflects the health status of our country.[6]

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