



**WHAT TO LEARN FROM PREDONATION DEFERRAL OF BLOOD DONORS?**

**DR.GARGADE CHITRAWATI B.\*<sup>1</sup> DR.DESHPANDE RANGRAO H.<sup>1</sup>**

*Department of Pathology BKL Walawalkar Rural Medical College, Derwan, India*

**ABSTRACT**

Blood cannot be manufactured-it can only come from generous blood donors. In an attempt to ensure a safe blood supply, there are strict controls on who may donate. There is a serious mismatch between demand and availability of blood in the country. The study was conducted retrospectively at a rural medical college in the Konkan area of Maharashtra. All those who deferred from blood donation between 1st January 2013 and 30<sup>th</sup> Nov 2015 were included in the study. Total deferral rate was 4.6%, with 30 % permanent deferrals and 70% temporary deferrals. Study of predonation deferral pattern may be helpful to know the health status of the general population and blood loss because of temporary deferrals can be minimized by providing health facilities and educating the population about their temporary deferral status.

**KEYWORDS:** Deferral, Blood Donors, Predonation, temporary



**DR.GARGADE CHITRAWATI B**

Department of Pathology BKL Walawalkar Rural Medical College, Derwan, India

## INTRODUCTION

Human blood is an essential element of human life with no substitute. According to National AIDS control organisation (NACO) there is a serious mismatch between demand and availability of blood in the country: against 8.5 million units/year requirement, the availability is only 4.4 million units per year. Another concern is that voluntary blood donation is only 52 %.<sup>1</sup> There are various myths among Indian people which stop them from donating blood. Most of the Indian blood donors are either family or directed donors while very few are Altruistic donors. While assuring safe blood to the recipient, it should be seen that that the blood collection process does not harm the donors health also. To fulfil critical balance in these two; some guidelines should be observed while selecting donors. The donor selection process results in deferral or rejection of potential blood donors. This often unexpected deferral can have several unintended adverse effects like feelings of rejection, feelings of discrimination, confrontation with "Old" diseases and unrealised risks.<sup>2</sup> The aim of our study was to know the profile of the blood donors and to find out the causes of the permanent and temporary predonation deferral.

## MATERIALS AND METHODS

This retrospective study was done in blood bank attached to a Rural Medical College. The study is approved by

ethical committee. Records of questionnaire filled by donors who came to the Medical college blood Bank and for outdoor voluntary blood donation camps during 1st January 2013 and 30 Nov 2015 were retrospectively reviewed and evaluated. The donors were evaluated on the basis of pre-screening tests like a questionnaire followed by clinical details, physical examination, Haemoglobin(Hb) estimation, blood pressure and temperature. The NACO guidelines were used for deferral of blood donors. Haemoglobin was measured by copper sulphate (CuSO<sub>4</sub>) method. The cut-off point for Hb was 12.0 g/dl, for weight was 45 kg. The donors below the age of 18 years and above 60 years were deferred. All individuals having systolic blood pressure above 150mm Hg and Diastolic blood pressure below 60 mm Hg were considered unfit for blood donation. Data was analyzed, and causes of deferral were categorized into permanent and temporary.

## RESULTS

Among 5036 donors who arrived for voluntary blood donation during the study period, 233 donors (4.6 %) were deferred before donation and the remaining were eligible to donate blood. Out of these 233 donors, 183 were male and 50 were female. As seen in Table 1, the majorities (163) were deferred for temporary reasons, and a smaller subset of 70 was permanently deferred.

**Table 1**  
*Distribution of donor deferral with respect to causes*

Causes	Total	%
Temporary	163	70
Permanent	70	30

The various causes of deferrals in the temporary and permanent subsets are shown in Table 2 and Table 3. Table 2 shows that among the 163 temporarily deferral cases, anaemia was the number one cause of deferral constituting (30%), followed by alcohol consumption in last 24 hours 17(10.4%), hypotension 15(9.2%) and

medication 12(7.4%). Amongst the 49 deferrals due to low Hb; 36 were female (73.4%) and 13 were male (26.5%). Among the 70 permanently deferred cases the leading cause of deferral was hypertension seen in 65 donors. It constitutes 92.8% of permanent deferral cases as shown in table no 3.

**Table 2**  
**Distribution of temporary deferral donor reasons**

Rasons for Temporary deferral	No. of deferral	% of Temporary Deferral	% of Total Deferral
Anaemia	49	30	21
Low Weight	7	4.2	3
Jaundice/Hepatitis	6	3.7	2.6
Hypotension	15	9.2	6.4
Alcohol consumption within last 24 hours	17	10.4	7.3
TB	2	1.2	0.86
Previous donation	2	1.2	0.8
Malaria	7	4.3	3
Fever	4	2.5	3
Acute Illness	2	1.2	0.8
Medication	12	7.4	5.2
Accident or surgery	2	1.2	0.8
Typhoid	1	0.6	0.4
Dog bite Anti rabies vaccine	1	0.6	0.4
Skin lesions	2	1.2	0.8
Tattoo or ear Piercing	2	1.2	0.8
Menstruation	2	1.2	0.8
Dental extraction	2	1.2	0.8
TT / Hepatitis vaccination	8	4.9	3.4
Piles	1	0.6	0.4
renal stone	2	1.2	0.8
Age	10	6.1	4.2
Inadequate sleep	7	4.2	3
Total	163		

**Table 3**  
**Distribution of Permanent deferral donor reasons**

Rasons for Permanent deferrals	No. of deferral	% of Permanent Deferral	% of Total Deferral
Hypertension	64	92.8	27.9
Epilepsy	1	1.4	0.4
Asthma	1	1.4	0.4
Diabetes mellitus	4(1 hypertensive)		1.3
Total	70		

Table 4 shows age wise distribution of hypertensive deferred donors. Out of 65 permanent deferred donors due to hypertension; 32(49.2%) were young adults in the age group of 18-35years.

**Table 4**  
**Age wise distribution of hypertensive deferral donors**

18-25 years		26-35 years		36-50 years		50-60 years	
Male	Female	Male	Female	Male	Female	Male	Female
9	2	21	0	27	1	5	0

## DISCUSSION

Blood donor deferral leads to loss of available blood units for transfusion. As per WHO, minimum need to meet a nation's basic requirement for blood is approximately about 1% of the population.<sup>3</sup> In India, according to NACO's statistics the annual requirement of blood for the country was estimated at 12 million units, of which DAC (Department of AIDS control) had a target of collecting 55 lakh units through the network of DAC supported blood banks in 2013-2014. The endeavour was to meet the blood needs of the country with voluntary non remunerated Donations, through a well-coordinated Blood Banking Programme. In 2013-2014, a total of 57 lakh units were collected and 84% of this was through voluntary blood donation.<sup>4</sup> Blood donor deferral is an uncomfortable and sad experience for the blood donor as

well as the blood bank where screening is done. Moreover, a deferred prospective donor often leaves them with negative feelings about themselves as well as the blood donation process.<sup>5</sup> These blood donors are less likely to return in future for any blood donation and have pronounced effect on them for future donation.<sup>6</sup> Donor deferral of 4.6 % in this study was very much similar to study done by Rabeya et al. (5.6%)<sup>7</sup> and Chauhan D N (4.60%)<sup>8</sup>. Some studies have even had a higher deferral rate of (16.4%) Chaudhary et al<sup>9</sup>, (35.6%) Charles et al.<sup>10</sup> In our study the permanent deferrals were 30 % while 70% donors deferred for a short time. The commonest cause of permanent deferral in our study was hypertension 92.8 % and one donor deferred was on epilepsy treatment forming 1.4 % of the permanent deferred donor. The same pattern was observed by study done by Pisudde PM at ESIC Hospital in Eastern India.<sup>11</sup>

The most common reason for permanent deferral in his study was hypertension (86.8%) and it was similar to other studies conducted in different parts of world.<sup>12-14</sup> Out of 360 permanent deferred cases, hypertension (30.3%) was the leading cause in recent Indian study by Fred John and Mary Rithu Varkey.<sup>15</sup> Almost half of the Hypertensive donors were below the age of 35 years in our study. High BP in most of these young donors was diagnosed first time during screening for blood donation. This fact needs further clarification to know whether high BP was due to anxiety, fear or nervousness or they are really hypertensive. Exercise and stress which are known to transiently increase blood pressure could be also a probable cause. These young hypertensive deferred donors should be further evaluated by monitoring BP on the same day and later periodically to rule out hypertension at an early age and need further follow up. In our study 70% of donors were deferred for temporary reasons. The most common cause for short term deferral in our study was anaemia 30 %, followed by 10.4 % due to alcohol consumption (intake in last 24 hrs), hypotension 9.2 % and medication 7.4 %. Haemoglobin screening safeguards anaemic individuals from donating blood and also protects returning donors from donation-induced iron deficiency (DIID), the depletion of iron stores by repeated donations.<sup>16, 17</sup> Collecting a unit of blood from a donor with a normal haemoglobin level also provides good quality blood components, with adequate and consistent haemoglobin content in the collected blood. Donor haemoglobin and/or haematocrit levels should be measured immediately before each donation using a validated technique that is subject to quality control. Donors who do not meet the minimum haemoglobin levels for blood donation should be referred for further haematological investigation and treatment. They should be encouraged to return to donate when the anaemia has been successfully treated. There are no rapid, simple and direct bedside methods for determining iron status. The pre-donation assessment of donor haemoglobin remains the best approach. Normal ranges for haemoglobin and red cell indices differ between ethnic populations, and in males and females, and are also affected by age, especially in women.<sup>18,19</sup> International and national guidelines commonly recommend minimum haemoglobin levels of 12.5 g/dl for females and 13.5 g/dl for males but further studies are needed to justify the selection of these levels. In some countries, the same haemoglobin level is used for males and females.<sup>20</sup> The cut-off point for Hb was 12.0 g/dl is considered for both male and female in our study. Low haemoglobin deferral occurs in about 10% of all donation attempts making it the most common cause of blood donor deferral.<sup>19</sup> A total of 21 % involving 5.5% males and 15.6% females were deferred due to low Hb level and this finding in our study was similar to that reported by S.Bahadur<sup>21</sup> in Delhi. Anaemia was the number one cause of deferral constituting (15.66%) in study by Fred John & Mary Rithu Varkey.<sup>15</sup> Individuals with haemoglobin levels below the normal range are, by definition, anaemic.<sup>22</sup> The WHO Global Database on Anaemia<sup>23</sup> defines haemoglobin thresholds for anaemia

as 12.0 g/dl for non-pregnant women ( $\geq 15.00$  years) and 13.0 g/dl for men ( $\geq 15.00$  years). It has been reported that 95% of deferrals for low Hb occur in women. It has been suggested by Newman BH that Hb standard be lowered to an increase female eligibility and to offer iron treatment for menopausal women who want to donate or for frequent donors.<sup>24, 7</sup>

***In determining the lower limits of haemoglobin and deferring anaemic patients from whole blood donation we should consider***

- Normal haemoglobin range among healthy individuals in the local population
- Selection of a validated haemoglobin screening technique that is subject to quality control, the feasibility of its implementation, the availability of equipment and the training and skills of staff
- Donors whose haemoglobin levels are below the nationally-defined threshold should be deferred, counselled and referred for medical assessment

The second common cause of temporary deferral in our study was alcohol intake in last 24 hrs (10.0%). Such high percentage of alcoholic deferral due upto 15 % and 10.5 % is shown by Mangwana<sup>25</sup> and S.Awasthi<sup>26</sup> respectively. Next reason for temporary deferral in our study was due to Hypotension (9.2%). Hypotension (18.75%) was the second commonest temporary deferral cause observed by Vamseedhar Annam.<sup>27</sup> Out of 233 donors 10 were deferred for consumption of medication in the past 12 hours accounting 6.1% of temporary deferral. Similar findings were found by B.Unnikrishnan et al<sup>28</sup> and Patil R S (9.5 %).<sup>14</sup> Deferral due to age in our study was 6.1% of the total donors. All donors deferred by us on age criteria were young less than 18 years age. We included these donors in category of temporary deferral. All these temporary deferred donors should be informed and educated about their temporary donor status and should be encouraged to donate later. It is important to set weight limits for blood donation to protect donors from adverse effects, in particular vasovagal episodes and anaemia. Low body weight and low blood volume have been shown to be independent predictors for vasovagal reactions.<sup>29, 30</sup> It is generally accepted that the volume of whole blood donated should not exceed 13% of blood volume: e.g. a donor should weigh at least 45 kg to donate 350 ml ( $\pm 10\%$ ) or 50 kg to donate 450 ml  $\pm 10\%$ .<sup>31,32</sup> There are no defined upper weight limits for blood donation; however, gross obesity may be a reason for deferral if veins are inaccessible, or if the donor's weight exceeds the safe loading capacity of the blood collection bed or impairs his/her mobility or the capacity of staff to provide care in the event of an adverse reaction. The estimation of blood volume is more difficult in obese individuals as fat contains proportionately less blood than muscle. Hence, blood volume may be overestimated, resulting in an increased risk of an adverse reaction. Low weight was the reason of deferral in our study in 7 cases accounting for 3 % of total and 4.2 % of temporary deferrals. In India, low weight was the common cause of deferral in study by Bahadur and colleagues<sup>21</sup> (26.6%

and by Chaudhary<sup>9</sup> and colleagues 9(32.3%). While only 2.9% and 2.73% were deferred due to low weight in study by Agnihotri N<sup>33</sup> and Patel S.<sup>34</sup> et al respectively. In determining a lower weight limit for blood donors, we should consider norms for the weight of the population; if a significant proportion of the donor population weighs less than 45 kg or 50 kg, collection volumes may be reduced accordingly, while ensuring that blood collection bags and their anticoagulant content are adjusted to be compatible with the volumes collected. Surveying the general population should be done to set the norms of lower limits of Hb and weight to prevent donor deferral due to anaemia and low weight without compromising the quality of donated blood. If not at least these anaemic and underweight patients should be evaluated, treated and counselled for future blood donation. Temporary deferred can donate the blood after short period of deferral in cases of vaccination, inadequacy of sleep, intake of medicines, alcohol consumption.

## CONCLUSION

This study showed that the deferral rate was 4.6 %. The temporary causes of deferral were more as compared to the permanent causes. Anaemia was the most common cause of temporary deferral in women. Temporary deferred donors can be minimized if proper information about short term deferral is given to the population where blood donation is arranged. Hypertension was the commonest cause of permanent deferral in male donors. The reason behind young hypertensive donors warrants further evaluation. Since both anaemia and underweight are easily curable, a large number of temporarily deferred donors can be recruited back into the donor pool if managed properly.

## CONFLICT OF INTEREST

Conflict of interest: Conflict of interest declared none.

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