

# Prevalence of Blood Donor Rejection Criteria in a Particular Area and Its Relation to Gender Distribution

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## ABSTRACT

*A retrospective analysis of blood donors was done in Delhi Paramedical And Management Institute where data of blood donation camp for deferral rate and causes for deferral were analyzed in both male and female blood donors. About 320 voluntary blood donors were registered for blood donation camp, out of these 137 blood donors were accepted and others were rejected on the basis of primary screening like body weight, hemoglobin, blood pressure and other medical history. The ratio of female donor deferral was more in comparison to male donor. The main cause for female deferral was low body weight and low hemoglobin. From our study we concluded that malnourishment plays a key role in blood donor rejection particularly in females of remote areas.*

**Keywords:** voluntary, deferral, rejection

## INTRODUCTION

The Food and Drugs Administration (FDA) mainly regulates collection of blood, its processing, storage, and preparation of blood components <sup>[1]</sup>. Blood donation is a process in which a donor by its own will donates a specified unit of blood irrespective of their profit. The blood donation is a noble act for the purpose of processing and storage of blood bags in a blood bank and for further use by needy patients. The process of blood donation involves selection of blood donors by screening. Selection process consists of obtaining medical history, and performing physical examination and certain laboratory tests of the patient. A blood donor questionnaire and consent form needs to be filled by the prospective donor before blood donation process. Individuals who are not eligible for blood donation are referred as “deferred” donors. Blood donor deferral process plays a very important role in blood donation process to make it safe and effective<sup>[2]</sup>. The present study was done mainly focusing on primary screening process and the ratio of deferral among genders in particular area only. The criteria for blood donor selection in India are provided by the Drugs and Cosmetic Act 1940 by the FDA and all the blood banks have to obtain a license from the FDA and follow the FDA guidelines <sup>[1]</sup>.

## MATERIALS AND METHODS

A blood donation camp was held on 11<sup>th</sup> November, 2014 at Delhi Paramedical and Management Institute’s premises in collaboration with Sashstra Sena Aadhan Kendra, Armed Forces Transfusion Centre, Delhi cantonment. The camp started at 10:00 am and continued till 4:00 pm. About 320 volunteers were screened for blood donation. The donors mainly included students, faculty, staff members of the institute, locals from nearby areas and political volunteers. The primary screening was done which included screening of donors on the basis of body weight, blood pressure, and pulse rate before undergoing blood investigation. At 10:00 am the registration process started and the forms were given to donors which included their personal initials and questionnaire related to their previous medical history. After the donors filled the registration form, the form was first checked by concerned Medical officer. The blood donors were screened for hemoglobin using Hemocue Hb 201+ (Hemocue AB, Angelholm, Sweden). The donors weighing more than 45 kg (for 350 ml) and more than 55 kg (for 450 ml) were accepted for blood donation. The cut off for hemoglobin was limited at more than 12.5 g/dl. Donors with blood pressure Diastolic: 60 to 90; Systolic Bp: 100 to 160 were accepted. Each donor was selected by a medical officer based on there medical history and physical examination.

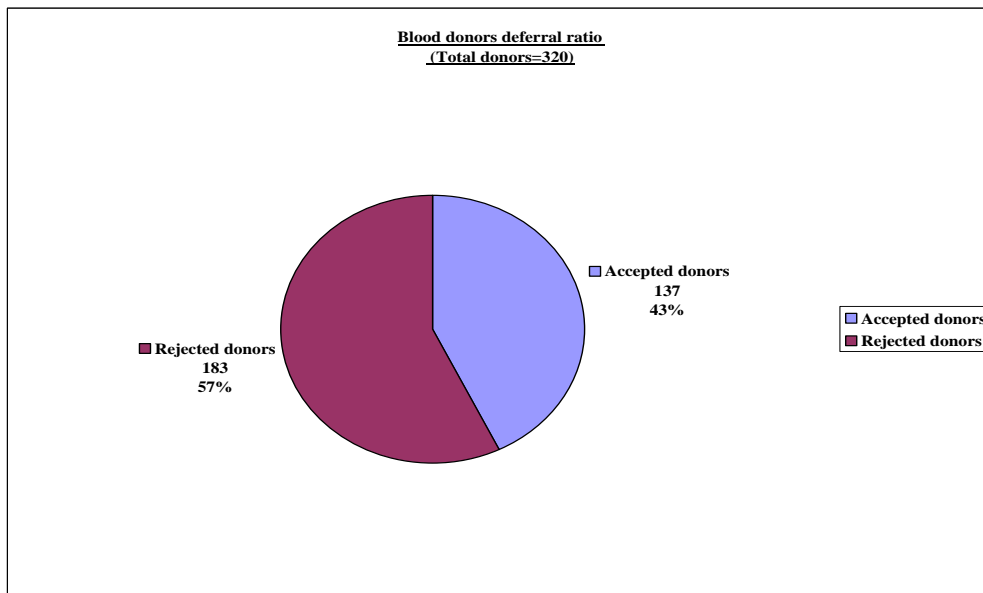
## RESULT

Our study involved only voluntary donors (non-profit donors) as blood donation camp was organized in a Institute instead of hospital where replacement donors also donate blood. About 320

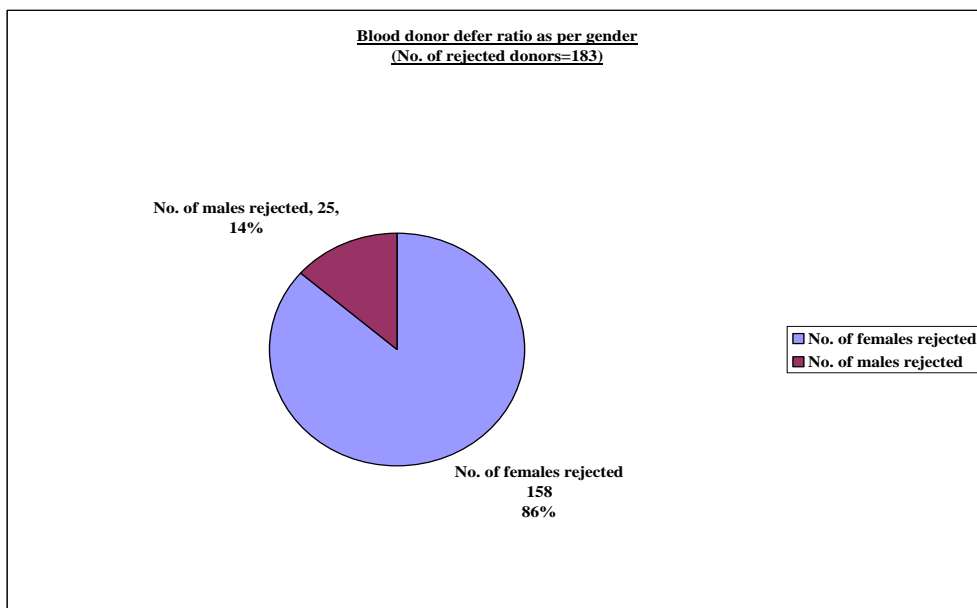
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voluntary blood donors were registered for blood donation camp. Out of these 137 or 43% blood donors were accepted and 183 or 57% people were rejected from the total voluntary blood donors who turned to the camp Fig 1. Out of them 98 blood donors were males and 39 were females. Therefore male blood donors contributed 71.53% while female blood donors contributed only 28.46%. The ratio for donor deferral was more due to female voluntary donors who contributed more towards the rejection rate. Out of those deferred or rejected, 25 (14%) were males and 158 (86%) were females and the deferral rate for male was 3.5% while among female was 20.5% as shown in Fig.2. The male deferral was

mainly due to hypertension, tattoos and consumption of alcohol previous night. Majority of female blood donor deferrals were due to low body weight (less than 45kg) and hemoglobin less than 11.5 g/dl as shown in Fig.3. The other factors which contributed to female deferral were piercing done on their body, lactation, menstruation, medical history like fever, common cold, antibiotic medication and recent dental extraction. The factors which contributed to male deferral include mainly hypotension (28%), low hemoglobin (28%) and underweight (36%). Other than this hypertension also resulted in deferral of some voluntary male donors as shown in Fig. 4.



**Fig. 1: Total blood donor deferral ratio**



**Fig. 2: Showing blood donor deferral in males and females**

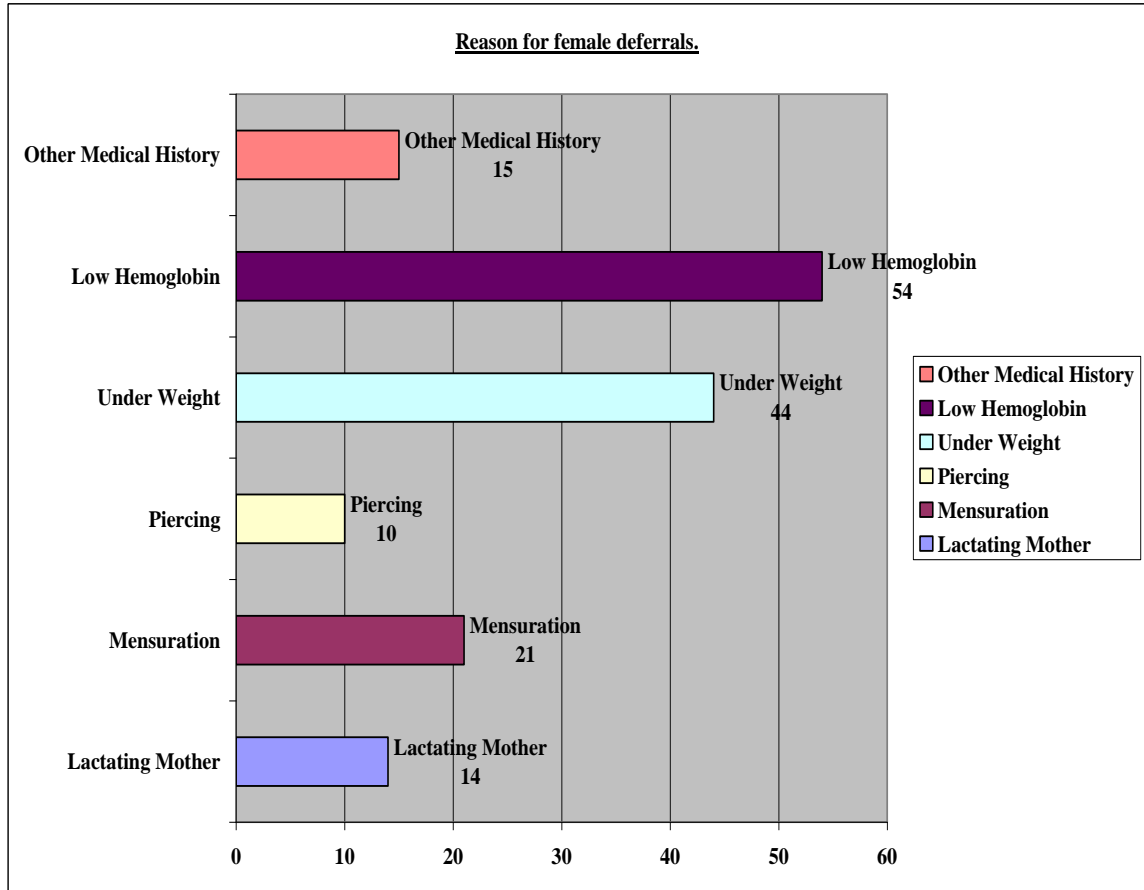


Fig. 3: Causes of female deferral

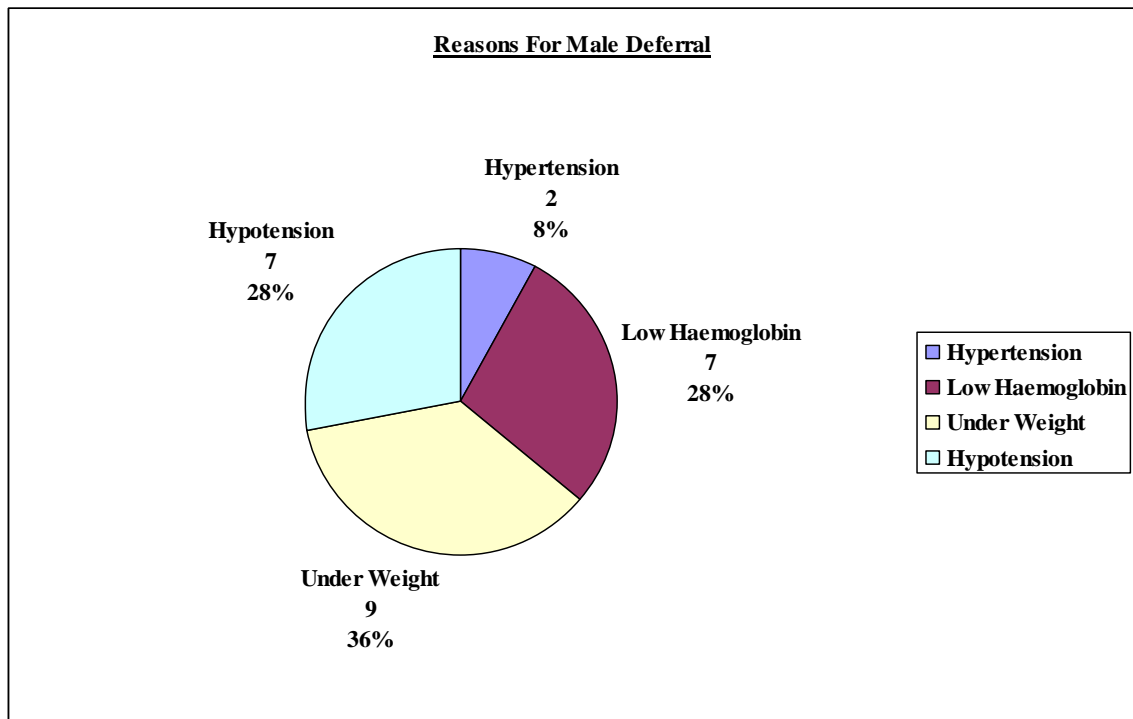


Fig 4: Reasons for male deferral.

## DISCUSSION

It is essential that the blood collection does not harm either the donor or the recipient which is achieved by donor selection criteria<sup>[1]</sup>. The criteria are based on scientifically informed medical opinion and regulatory rules. Deferring donors protects both the blood donor and the recipient from any harm.<sup>[2]</sup> Blood donor deferral is a painful and sad experience for the blood donors as well as for the blood donation centers which screen the donors. Moreover, deferring leaves donors with negative feelings about themselves and about the blood donation process. Additionally, these donors are less likely to return for blood donation in future<sup>[3]</sup>. Nonetheless, the criteria for these deferrals and their implementation strongly influence the quality of blood supply in a population. Thus, every blood centre has to balance the fulcrum between the acceptable quality and the desired quantity of blood.<sup>[4]</sup>

Donor deferral rates in blood centers vary from 5 to 24% leading to huge losses in terms of available units for transfusion in the nation every year<sup>[5]</sup>. The rate of deferral differs from region to region and sometimes in the same region and one center to another<sup>[6]</sup>. In our study the overall deferred rate was 57% and the deferred rate was higher in females(86%). P.Sundar *et al* had also shown the deferral rate more in females other than males<sup>[7]</sup>. The lowest reported rate of rejection was Talonu T<sup>[8]</sup> (4%) in Papua New

Guinea and higher rate 8-15% was reported in previous studies.<sup>[9,10,11,12]</sup> The age limit for blood donation is up to 60 years. Gary et al, advice elderly healthy individual to donate in limits which is less than five per year or donors are advised to take iron supplement regularly to preserve reasonable amount of iron reserve.<sup>[13]</sup> In this camp age group deferral was least as most of the donors were college students and above 18 year of age since youth is more curious about participating in blood donation camps and are unaware about the low age limit for blood donation camps. The cause of deferral is broadly classified into two types- The temporary deferral and the permanent deferral<sup>[7]</sup>. In our study majority of deferral was temporary while only 2% was permanent. Same kind of data was analyzed by Custer B et.al.<sup>[14]</sup> The deferred donors were explained the reason for their deferral. In case of male the reason for temporary deferral was underweight and in few cases low hemoglobin. The reason for temporary deferral in case of female was also low hemoglobin, low body weight, low BP and medication on antibiotics. In other previous studies the most common causes for temporary and short term deferral (STTD) in female were low hemoglobin level, low body weight, and hypotension and in males low hemoglobin level and hypotension<sup>[7]</sup>. Halperin et al reported three most common STTD low hemoglobin level, colds and/ or

sore throats and elevated temperature<sup>[15]</sup> whereas that by Ranveet et al, under-weight, under-age, and low hemoglobin levels. Hence, studies on donor deferral indicate that in each region there would be unique sets of reasons. The effect of short term, temporary deferral STTD on blood donor returns and subsequent blood donation is an important issue. STTD have a very negative impact on blood donor return rates and subsequent donations<sup>[12]</sup>. This selection process plays a very important role both for donor and receiver.

Though the deferring process put the donor in a doubt but this process terminates the risk of disease. As receiver of blood unit is already poor in immunity a small mistake in transfusion could be critical for receiver. Deferring process also protects donors from adverse reactions regarding blood transfusion reactions.<sup>[16]</sup> The deferral due to low hemoglobin contributed a lot in our study. Most of the studies have emphasized more on low hemoglobin level as important criteria for deferral<sup>[14,15,16,18,19,20,21]</sup>. The deferral rate in males on the basis of low hemoglobin is very low due to the production of testosterone hormone.

The reason for male deferral was due to mostly recent blood donation in other camps. The female deferral due to low hemoglobin occupied a majority of data as 54 females were rejected due to low hemoglobin only. In addition the hypotension and menstruation also contributed a lot to deferral ratio in females.

## CONCLUSION

It is clear that in most of areas the ratio of female deferral was more in comparison with male deferral. The ratio of female donor deferral in comparison with male donor deferral is most due to several physiological and nutritional deficiencies. Majority of female population in backward areas is deferred due to nutritional crisis. Females still are not concerned to their diet. Apart of this, the cause of low hemoglobin could be physiological parameter like the monthly menstruation cycle which leads to loss of blood and thus loss of iron.

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**CONFLICT OF INTEREST:** The authors declare that they have no conflict of interest.

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