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Analysis Of Causes and Pattern of Blood Donor Deferrals at Tertiary Care Centre-A Five Year Study

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Abstract

INTRODUCTION- The blood donor deferrals play a vital role in safe transfusion of blood products. The blood donor selection criteria laid down signifies the uniform and scientifically unbiased method to collect a safe donor pool. The aim of the study is to analyze the causes and pattern of blood donor deferrals at tertiary care hospital-Meenakshi Medical College, Hospital and Research Institute, Kanchipuram.

MATERIALS & METHODS-This study was based on Hospital based blood bank and was both retrospective and prospective study (2016 -2020). The data available as donor deferral record registry over a period of 5 years was reviewed and detailed for the study. The study involves both voluntary and replacement blood donors. Results were then statistically analyzed with emphasis to know the causes of deferral.

RESULTS – Of the 8819 registered blood donors, 97% were eligible for donations and 3% were deferred. Temporary deferral was more than permanent (72% vs 28%). Age group pattern for deferral was high among 18-30 years in both male and female deferrals (42.05% and 16.29% respectively). Leading cause of deferrals among male was hypertension (24.76%) followed by hypotension (15.71%), anemia (15.24) whereas in female, the leading cause of deferrals were anemia (63%), hypotension (13%) and underweight (5.6%).

CONCLUSION- The study focuses on the blood donor selection and specific causative deferrals which can be well assessed to inform, caution and evaluate temporary causes and treat if needed. The significance of temporary and permanent deferrals plays an important role in individual safety and further pooling eligible donors for future.

Keywords: Donor deferral, Donor selection, temporary deferral, permanent deferral

INTRODUCTION

Blood transfusion is the major life saving procedure at the need of an hour. The blood is the gift of life as it cannot be made, despite medical and technological advances. A single donation can save three lives. The transfusion medicine aims on the safe donation and safe transfusion practice to both the donor and the recipient.

Thus, in ordeal, blood safety handling is of utmost priority in health care setups. The blood donor selection criteria and blood donor deferrals are an important tool to maintain the safety and effect of blood handling. Deferred donors are the individuals who did not meet the criteria of safe potential donor. The importance of blood donor deferrals plays a key factor in control of transmissible disease and safety of both donors and recipients.

The blood donor selection and blood donor deferral criteria guidelines have been approved by the governing body of National blood transfusion council with combined approval of National AIDS Control Organization NACO [1]

WHO records the data statistics of about 118.4 million blood donations are collected worldwide. Blood donation rate is around 31.5% in high income countries, 15.9 % in upper middle-class countries, 6.8 % in lower middle-income countries and 5% in low-income countries [2].

In India around 11 million blood donations are collected every year against the required 13.5 million for 1.35 billion population in the country (1%), leaving a vacuum of nearly 2 million [3]. The statistics signifies the importance and necessity of blood donation.

Materials and methods

This analytical and cross-sectional study is both retrospective and prospective research over a period of 5 years from January 2016 to December 2020.

The research includes both voluntary and replacement donors.

The potential donors are given a questionnaire to be filled to update their health status, history and demographic data. Physical examination was performed which included examination of the weight, pulse, blood pressure, and body temperature. Hemoglobin was checked using the finger prick copper sulphate solution method. The data filed is taken from donor register and donor questionnaire, compiled and statistically analyzed, and categorized consistent with age, gender, and explanation for deferral.

Results

The total population of potential donors registered at Meenakshi Medical College, Hospital and Research Institute over a period of five years i.e. from January 2016 to December 2020 is 8819 out of which 264 donors were deferred due to various reasons and 8555 donors could donate blood safely [Figure1].

Among the 8555 donations, 8155 are male donors (95%) and 400 are female donors (5%) [Figure2].

Among the total deferrals of 264, 210 are male (80%) and 54 are female (20%) [Figure3].

Among the deferred males, 18-30yrs age group had maximum deferrals of 110 (53%) and in deferred females also 18-30years age group had , maximum deferrals of 42 (79%) [Figure4], [Figure5]& [Table 1].

Among the deferred males, the most common cause for temporary deferral is hypotension (15.71%) [Figure6] followed by low hemoglobin levels (15.24%). The complete list of causes of deferral among males is enlisted in [Table 2] Permanent deferrals was noted only in male potential donors with hypertension being the major cause (24.7%) followed by severe allergy and patients on anticonvulsants and insulin dependent medications [Table 2].

And among deferred females, most predominant cause of deferral is anemia i.e., low hemoglobin levels accounting for 63.4%[Figure7] followed by hypotension (15%). The complete list of causes of deferral among female is enlisted in [Table 3].

Among the total deferrals, the number of temporary deferrals is 190 (72%) and the permanent deferrals are 74 (28%) [Table 4] & [Figure8].

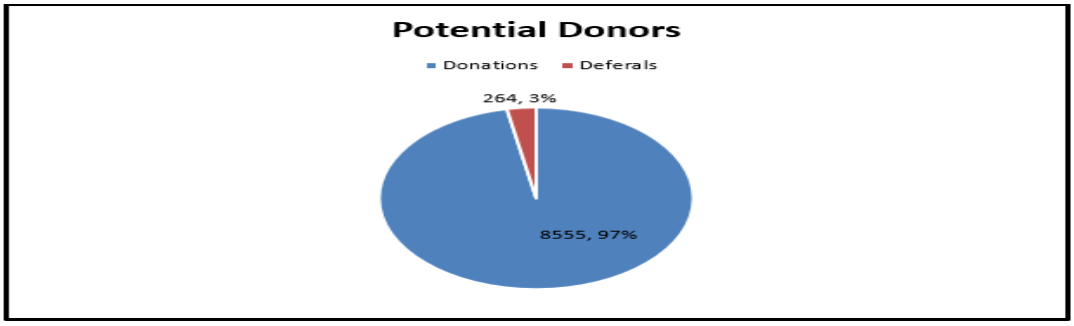

Figure 1

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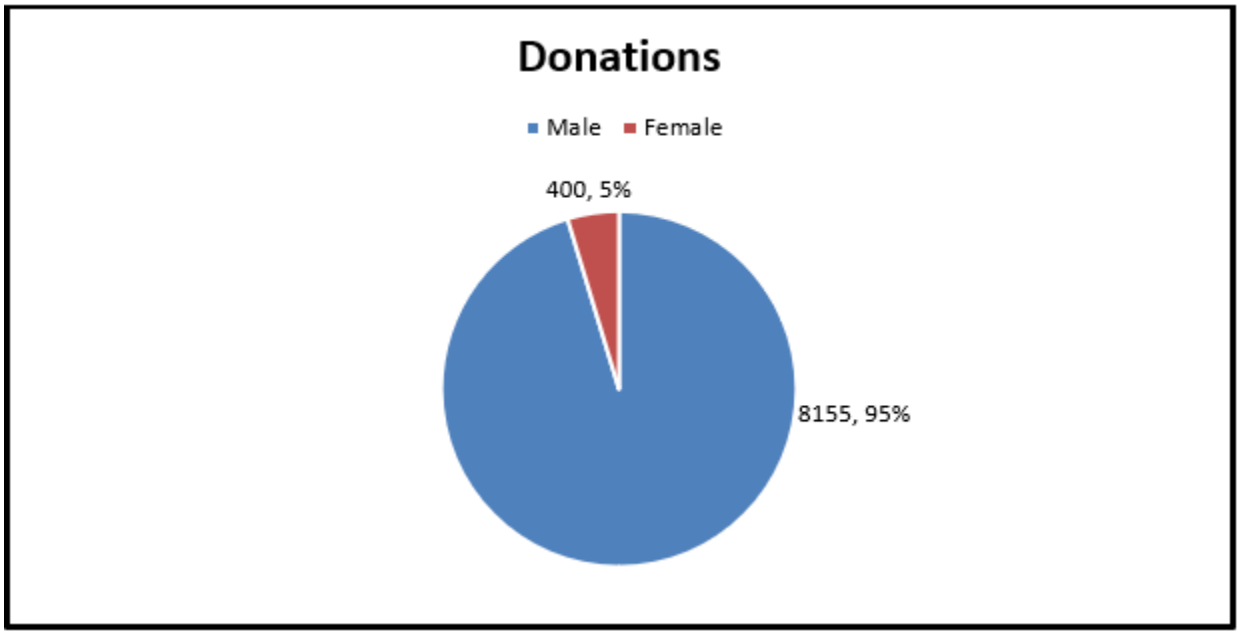

Figure2

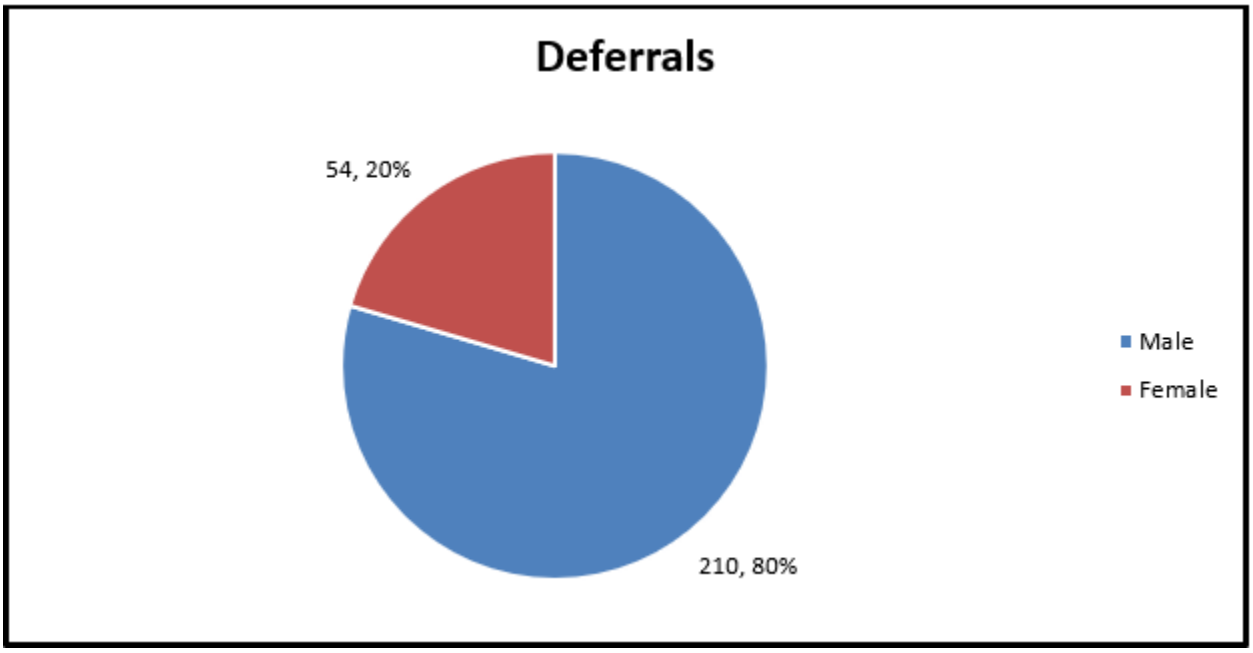

Figure 3

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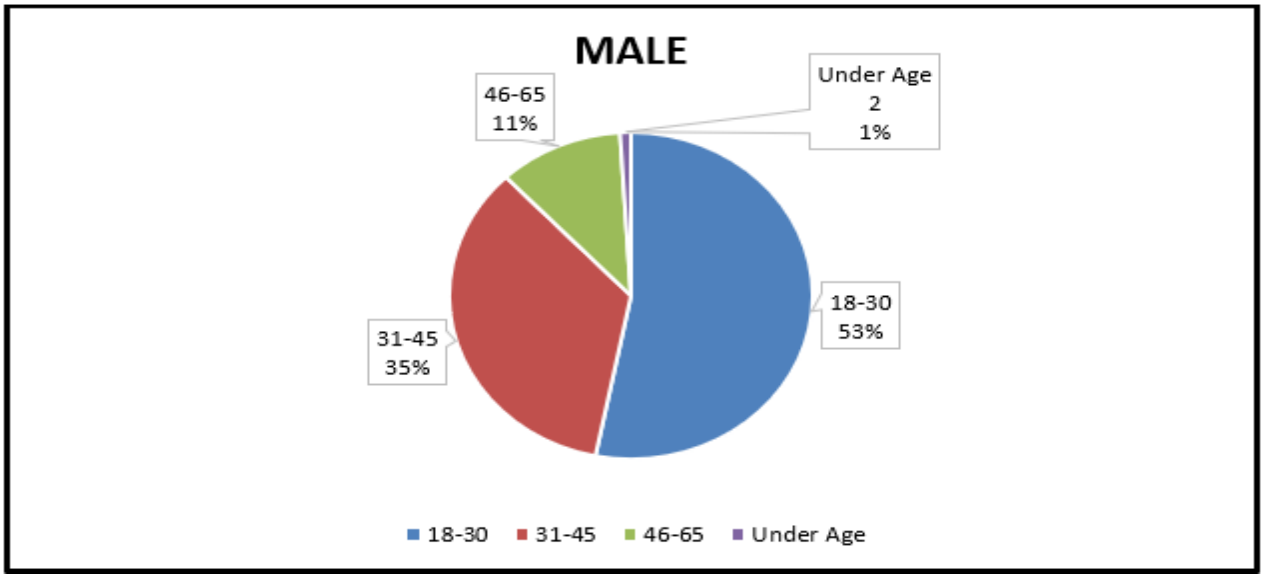

Figure 4

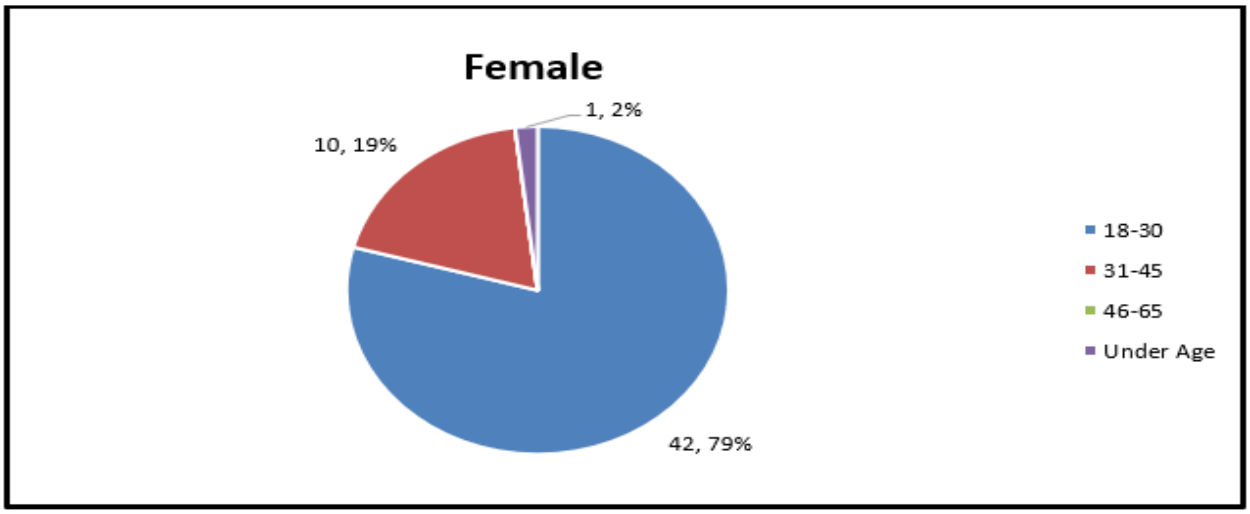

Figure 5

Table 1

AGE GROUP	FEMALE	FEMALE % TO TOTAL DEFERRALS	MALE	MALE % TO TOTAL DEFERRALS
18-30	43	16.29%	111	42.05%
31-45	10	3.79%	73	27.65%
46-65	0	0.00%	24	9.09%
Under Age	1	0.38%	2	0.76%
Grand Total	**54**	20.45%	**210**	79.55%

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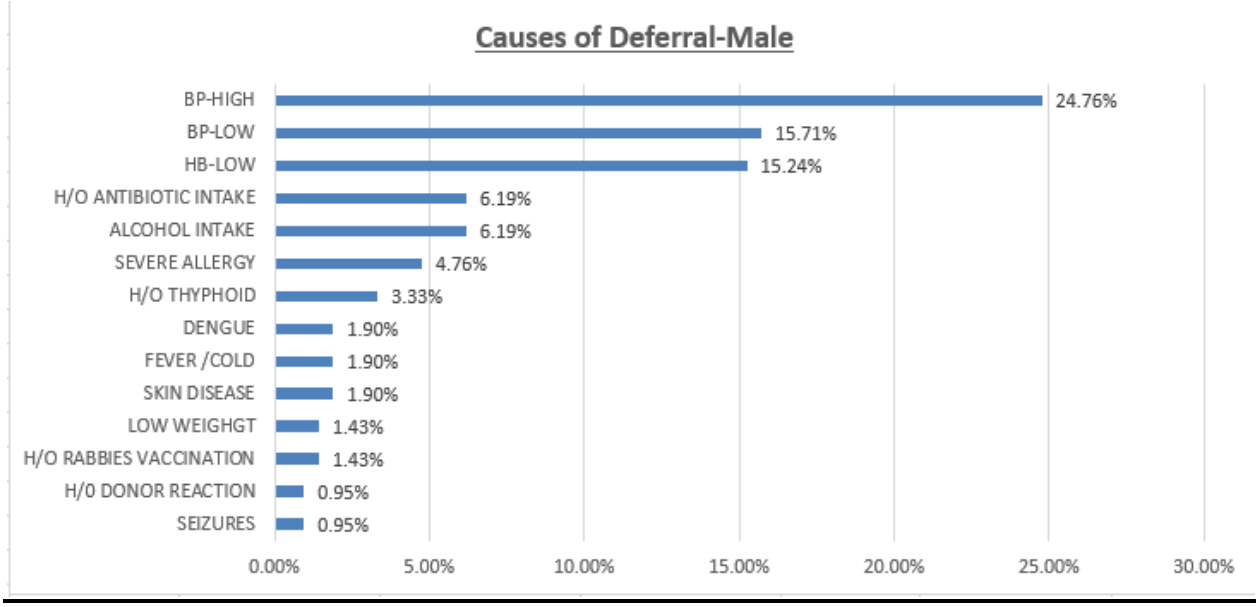

Figure 6

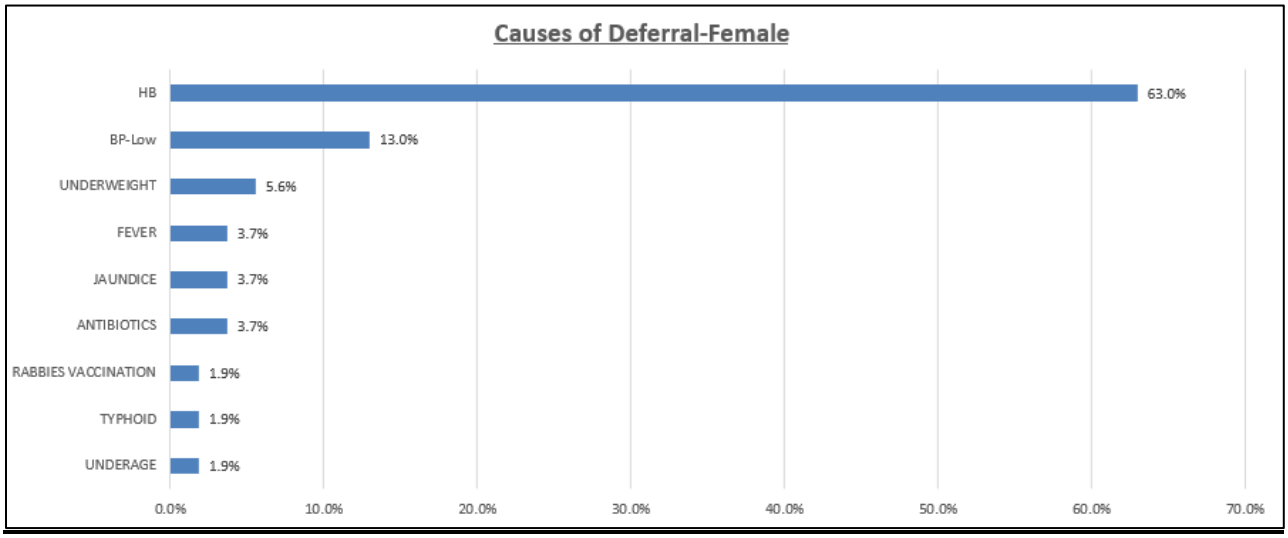

Figure 7

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[Table 2] **MALE DEFERRAL CAUSES**

DEFERRAL VARIABLES	MALE NUMBER	%
*BP-HIGH	52	24.76%
BP-LOW	33	15.71%
HB-LOW	32	15.24%
ALCOHOL INTAKE	13	6.19%
H/O ANTIBIOTIC INTAKE	13	6.19%
MISCELLANEOUS (FATIGUE, ARM PAIN, PREVIOUS DONATION <3MONTHS, ANXIETY, ON AYURVEDA Rx, SMOKING 2hrs PRIOR)	11	5.24%
* SEVERE ALLERGY	10	4.76%
H/O TYPHOID	7	3.33%
*SKIN DISEASE	4	1.90%
FEVER /COLD	4	1.90%
DENGUE	4	1.90%
H/O RABIES VACCINATION	3	1.43%
LOW WEIGHT	3	1.43%
*SEIZURES	2	0.95%
C/O GIDDINESS	2	0.95%
H/O JAUNDICE	2	0.95%
*H/0 DONOR REACTION	2	0.95%
UNDER-AGE	2	0.95%
DIABETES	2	0.95%
* INSULIN DEPENDENT	2	0.95%
TB	2	0.95%
*ASTHMA	1	0.48%
VACCINATION	1	0.48%
EAR PIERCING	1	0.48%
MALARIA	1	0.48%
CHICKEN POX	1	0.48%
SPOUSE POSITIVE FOR HbsAg	1	0.48%
*HEPATITIS B	1	0.48%

***- Permanent Deferral, BP- Blood pressure, H/O- History Of, Hb- Hemoglobin**

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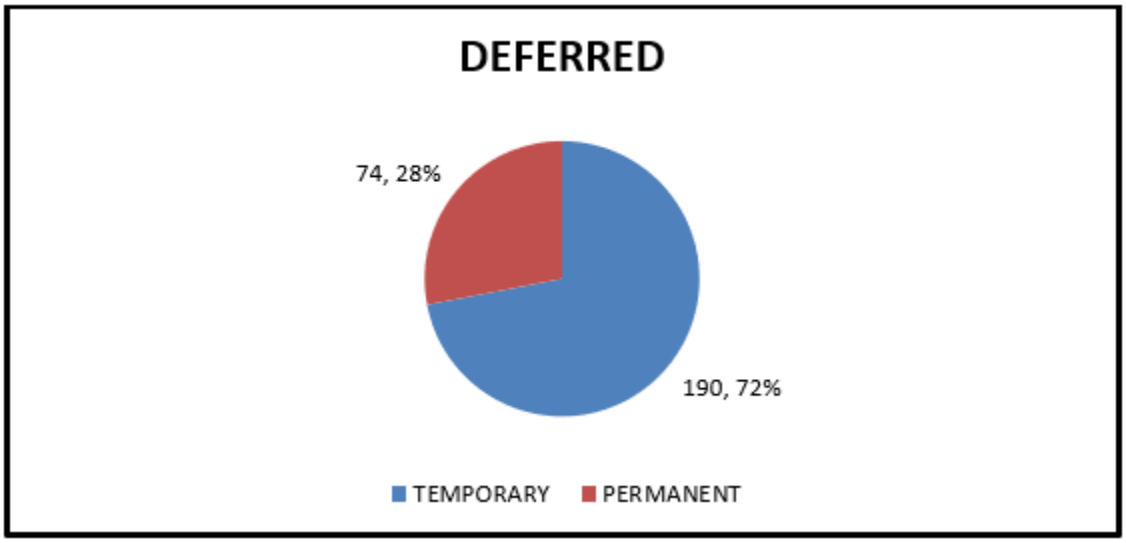
[Table 3] **FEMALE DEFERRAL CAUSES**

DEFERRAL VARIABLES	%	NUMBERS
HB	63%	34
BP-Low	15%	8
UNDER-AGE	2%	1
UNDER-WEIGHT	6%	3
TYPHOID	2%	1
RABIES VACCINATION	2%	1
ANTIBIOTICS	4%	2
JAUNDICE	4%	2
FEVER	4%	2

Table 4

DEFERRAL TYPE	NUMBER	%
TEMPORARY	190	72
PERMANENT	74	28

Figure 8



Discussion

The importance of donor deferrals analysis in the tertiary care hospital enlightens the most common cause among the potential donors in that particular region. Deferrals list is an outcome of pre donation screening among individuals unaware of certain medical conditions and creating an awareness of future safe blood donations. Deferral rates vary region wise

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and area wise. Donor selection criteria aids in positive recruitment of potential safe donors [17, 18] and embarks the necessity of safe blood transfusion region, state and nationwide. The significance of donor selection and deferrals gives emphasis for safe transfusion [15]. As the requirement of blood is on rise due to various life saving reasons, this study stresses on pooling voluntary and replacement donors with general awareness and also to recruit the potential donors again after the temporary deferral. Blood components and its transfusion needs an extreme surveillance as the risk of infection, transmissible disease or any side effects may cause crucial setback in healthcare of an individual [17]. Ultimately for the safety reasons, donor selection criteria is laid by the governing authorities to follow a uniform and resilient protocol for selection and deferrals [1].

The pattern and causes of deferrals at Meenakshi Medical College, Hospital and Research Institute is discussed below briefly in this study.

In our study, registered potential male donors were 8365 and female donors were 454 out of which suitable selected male donors were8155(95%) when compared with women, 400 attributing only (5%). This finding was similar to various other studies Kokani M.J reported 94.25% men and 5.8% women [4]Birjandi reported 95.6% male and 4.4% female donors [5]. Unnikrishnan et al reported 95.13% male and 4.8% female donors [6]. Males dominated the donor population (93.8%) with females making up the numbers with 6.2% Agrawat et al [7].

This discrete finding of low female donor population attributes to decreased awareness, social stigma, and poor motivation factors for blood donation. Awareness and education regarding the blood donation and programs should be inculcated to general population, notably to the female population to provide an optimistic encouragement towards its goal of attaining potential prospective donor pool.

The deferrals among the potential individual donors are age specifically divided for better understanding and to attain a statistical significance. The most common age group category under deferral in our study was found to be 18- 31 yrs in both male and female deferrals. The age group deferral reflects the medical status of the individual in contrast to their physical health. The deferral rate could be significantly more with this age group as it statistically correlates with the increased number of donors within this age group in both the sexes. Similar findings were reported by different authors such as Shah et al [18], Girish et al[19], Rathod et al[8] and Gajjar et al[10] and Sundhar P et al [21]. Few studies reported maximum deferral at the age group 39-50 years followed by 25-39 yrs Kokani M.J[4]

In our study the deferral rate was 3.0%. Similar findings were reported in the following,

The deferral rate in Kokani M.J **[4]** Study was 1.93 %.

Rathod et al[8]reported deferral rate of 3.55%

Agrawat et al [7] reported 3.72%

Toluno T [22] reported 4%

Chauhan DN et al [23] reported 4.6%

John F et al[20]reported 5.12%

Unnikrishnan B et al [6] reported 5.2%

Rabeya Y et al [13] reported 5.6%

Sundar P et al [21] reported 5.84%deferral rate in their studies

Few studies like that of Agnihotri [9] ,Gajjar et al [10], Sonal Kumar Hemanth [11], Mangwana S[24], Sareen et al[25], choudhary RK et al [26] and Lim LC et al[27]reported higher deferral rates of 11.6%,11.16%,13.1%, 17.88%, 22.32%, 16.4% and 14.4% respectively. The incidence of deferral rates depends and vary due to regional diversity.

In this present study, the most common cause of deferrals among males is blood pressure variability amounting to 33.97% with high blood pressure contributing 24.76% and low blood pressure contributing 15.71%. Most of the high blood pressure reading in donors was due to uncontrolled hypertension and irregular medication intake history while some had first time high reading and the donors were being asymptomatic. Diagnosis of variation in blood pressure for the first time among donors referred them to check for blood pressure monitoring and further consultation with physician for treatment and this seemed to be a valuable screening for the potential donors. This finding was similar to the findings reported by various studies as Shrivasthava M et al [16], Rathod et al[8], Sundar P et al [21] and Awasthi et al [28].

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Hypotension was the next most common cause of the deferral followed by low hemoglobin for males reflecting the nutritional status, health condition even though asymptomatic and thereby an opportunity to get treated and return to potential donor pool. The permanent deferral pool consists only of male in the study attributing to hypertension as major cause and followed by severe allergic symptoms and causes listed in Table 2.

Among females, the most common cause of deferral is low hemoglobin level contributing 63%. Anemia is the major cause of deferral among women owing to majority of reason nutritional deficiency and menstrual problems and poor health maintenance. The identification of anemia among women bears the utmost necessity of maintaining physical health [14]. This finding were similar to findings in John F et al[20], Rathod et al[8], Sundhar P et al [21], Choudhary RK et al[26].

It is noted that temporary causes of deferral (72%) are more common as compared to the permanent causes (28%) and found to be highly significant in our study, in concordance with other studies such as those by Jethani *et al* [12], where temporary deferrals accounted for 87.5% and permanent for 12.5% of total deferrals. The causes of permanent and temporary deferrals are listed in table 2 among men and in table 3 among women. In our study there were no permanent deferrals among the deferred women.

Deferrals are mainly classified as temporary and permanent**.**The governing body of National blood transfusion council with combined approval of National AIDS control organization NACO have enlisted the various criteria categorizing into permanent and temporary deferrals along with deferral duration in cases for temporary deferrals[1] . Individuals with permanent deferrals cannot donate blood in future for the benefit of self and recipient.

Individuals with Temporary deferrals are explained and discussed the nature of deferral. The individuals are detailed about the period of deferral and encourage them to come forward for future safe blood donations.

Conclusion

It is vital to provide donors with a transparent message on their deferral status. Increased public education about blood donation and therefore the common causes of donor deferral may lower deferral rates and eliminate a negative impact on the donor themselves also as on subsequent blood donations. Public education is required also to assist recruit as many voluntary donors as possible. It is emphasized to enhance the donor retention strategies to augment the regular blood donors' pool.

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