

**Evaluation of Blood Donor Deferral Pattern in a Tertiary Hospital Based Blood Bank**Valina Brahma<sup>1\*</sup>, Antariksha Sharma<sup>2</sup>, Karishma Bhuyan<sup>3</sup>, Mayurpankhi Saikia<sup>4</sup><sup>1</sup>Assistant Professor, Department of Pathology, Gauhati Medical College and Hospital, Assam, India<sup>2</sup>Demonstrator/Registrar, Department of Pathology, Gauhati Medical College and Hospital, Assam, India<sup>3</sup>Demonstrator/Registrar, Department of Pathology, Gauhati Medical College and Hospital, Assam, India<sup>4</sup>Assistant Professor, Department of Pathology, Gauhati Medical College and Hospital, Assam, India

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**Abstract:**

**Background:** Selection of blood donor is an important procedure for a secure and healthy blood transfusion. Following a rigorous process of donor selection, disqualified donors are termed as deferred donors. Deferral causes range from temporary to permanent causes. The causes and rates of donor deferral differ from region to region. Present study was undertaken to identify the causes of donor deferral and deferral rates in our blood bank.

**Methods:** This study was a retrospective study which was conducted in a tertiary care hospital based blood bank from North East India for a period of one year between September 2022 and October 2023. All the blood donors were screened following the guidelines of the National AIDS Control Organisation (NACO) provided in Standards for Blood Banks and Blood Transfusion Services under the Drugs and Cosmetic Act 1940. The relevant information and data of the deferred donors were collected and evaluated from the donor deferral register.

**Results:** A total of 30,156 28,156 potential blood donors were undertaken in this study, out of which 2830 2,730 cases were deferred. Total donor deferral rate was 9.38 9.69%. The most common cause of deferral was anaemia (Hb<12.5 gm/dl) comprising of 54.58%.

**Conclusion:** Awareness of donor deferral including causes and incidence in a specific region is essential in developing improved strategies to diminish the loss of valuable blood donors as it will ensure quality and safe blood and blood products for the recipients.

**Keywords:** Donor Deferral, Temporary Deferral, Permanent Deferral, Anaemia.

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**Introduction**

Blood transfusion is taken as an important lifesaving procedure in medical field. It should be healthy and safe. Thus, donor selection is the cornerstone for blood transfusion to protect the health of both donors and recipients.[1] The donors who are disqualified for donating blood are called deferred donors. Deferral reasons may be temporary or permanent causes. The rates and causes of deferral vary from place to place.[2] This study was carried out to know the causes of donor deferral and rates in our blood bank.

**Materials and Methods:**

A retrospective study was conducted in a tertiary hospital based blood bank from North East India for a period of one year. All blood donors were screened as per guide lines of the National AIDS Control Organisation (NACO) provided in Standards for Blood Banks and Blood Transfusion

Services under the Drugs and Cosmetic Act 1940.[3]

Individual donor was assessed by the standard questionnaire, medical examination including age, weight, pulse, temperature, blood pressure (BP), haemoglobin (Hb) estimation and transfusion transmitted infection (TTI) screening tests. Cut-off value for Hb was 12.5 gm/dl, body weight not <45 kg, systolic BP 100-180 mmHg, diastolic BP 50-100 mmHg, and age 18-60 years.

Estimation of hemoglobin was conducted by Hemocue test and hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV) tests were performed by Enzyme linked immunosorbent assay (ELISA), Syphilis by rapid plasma reagin test & malaria by rapid kit test. The data regarding the deferred donors were collected and analyzed from the donor deferral register and then deferred donors were categorized

as temporary & permanent depending upon the causes.

### Result

A total of 28,156 potential blood donors were registered for donation of blood during the study period of one year. Out of which, 25,426(90.31%) were accepted for blood donation and 2730 (9.69%) were deferred for various reasons. There were 27,492 male registered donors of which

24,892(90.54%) donated and 2600(9.46%) were deferred. Out of 664 female donors, 534(80.42%) were accepted for donation and 130 (19.58%) were deferred. Out of total 1365 deferred donors, 745(54.58%) were deferred temporarily because of anaemia (Hb<12.5mg), 218(15.97%) for alcohol consumption within 24 hours before donation, 49(3.59%) for underweight (<45kg) and 44(3.22%) for hypertension [Table 3].

**Table 1: Demographic profile of donors**

Donor	Male	Female	Total (%)
	Number (%)	Number (%)	
Registered	27,492(97.65)	664(2.35%)	28,156(100)
Donated	24,892(90.54%)	534(80.42%)	25,426(90.31%)
Deferred	2600(9.46%)	130(19.58%)	2730(9.69%)

In this study, total donor deferral rate was 9.69%. Deferral rate of male donor was 9.46% and female donor deferral rate was 19.58% [Table 1].

**Table 2: Types of deferral**

Deferral type	Total	Deferral percentage	Deferral rate on total screened donors
Temporary	2414	88.42%	8.00%
Permanent	316	11.58%	1.12%
Total	2730	100%	9.69%

A total number of 2414 (88.42%) donors were deferred for temporary causes and 316 (11.58%) were deferred for permanent causes [Table 2].

**Table 3: Reasons for temporary deferral**

Reasons	Total number	Percentage (out of 2414)	Percentage on total deferral (out of 2730)
Anemia (Hb<12.5)	1490	61.7%	54.5%
Underweight(<45kg)	98	4.06%	3.58%
Underage(<18 years)	24	0.99%	0.88%
Hypertension	88	3.65%	3.2%
Diabetes	04	0.17%	0.14%
On medication	12	0.49%	0.43%
Lack of sleep	28	1.15%	1.02%
Tattoo	54	2.24%	0.87%
Vaccination	12	0.49%	0.43%
Frequent donation	12	0.49%	0.43%
Menstruation	06	0.50%	0.24%
Allergic conditions	58	2.24%	2.12%
Inadequate collection	20	0.83%	0.73%
H/O malaria	06	0.25%	0.21%
H/O recent operation	20	0.82%	0.73%
Skin lesions	34	1.41%	1.24%
Consumption of alcohol	436	18.06%	15.9%

Out of total 2730 deferred donors, 1490 (54.58%) were deferred temporarily because of anaemia (Hb<12.5mg), 436 (15.97%) for alcohol consumption within 24 hours before donation, 98 (3.58%) for underweight (<45kg) and 88(3.22%) for hypertension [Table 3].

**Table 4: Reasons for permanent deferral**

Reasons	Total number	Percentage (out of 316)	Percentage on total deferral (2730)
Hepatitis B	108	34.2	3.9
Hepatitis C	78	24.7	2.9
Syphilis	64	20.3	2.3
HIV	60	19	2.2
Cardiac Disease	04	1.3	0.2
Neurological Disease	02	0.7	0.07
Total	316	100	11.6

There were permanently deferred donors, 108 (3.9%) due to Hepatitis B, 78(2.9%) due to Hepatitis C, 64(2.3%) due to Syphilis and 60(2.20%) due to HIV [Table 4].

### Discussion

Donor selection is an essential step for safe and healthy blood transfusion. The rates and reasons of donor deferral differ from region to region. This study was carried out to identify the causes of donor deferral and deferral rates.

The rate of donor deferral reported in our study was 9.69% which is similar to the study of Awasthi S et al which is around 10.4%. [4] Other studies done by E. Sabari Priya,

Shrivastava M et al, Shah A et al, Mulla FI et al, and Aneke CJ et al observed donor deferral rates of 6.5%, 11.5%, 17.39%, 13.02% and 32.50% respectively in their literatures from various parts of India as well as Internationally. [5,6,7,8,9] These difference in donor deferral rates may be due to diverse donor selection criteria, disparities in prevalence of anaemia and TTIs in general populations of the various study locations.

Our study observed an increase number of deferral rates of female donor (19.58%) than male donor (9.46%) which are similar to other studies done by E. Sabari Priya, Chauhan DN et al and Patel S et al. [5,10,11] The recorded permanent deferral rate and temporary deferral rate was 11.58% and 88.42% respectively in this current study which is similar to a study by Sundar P et al. [12] The commonest cause of deferral in our study was anaemia which comprised of 54.58% that is similar to the study done by Agnihotri N [13] Like our study, most of other studies done in past were shown low haemoglobin as a main reason for deferral of blood donors. [14,15,16,17,18] This shows that an increased prevalence of anaemia (mostly iron deficiency anaemia) in our population exists. Nutritional deficiency, worm infestation and frequent blood donation could be the causes as a single unit of donation of blood has been shown to cause decrease in iron up to 236 mg from body stores. [19]

Consumption of alcohol in the last 24 hours before donation of blood was the second most common cause of temporary deferral in our study similar to other past studies. [5,10,14] Awareness programme regarding the same and adequate information with adverse effects of alcohol intake, significance of blood donation and criteria for selection should be given to the people which can reduce the deferral rates due to consumption of alcohol. Other reasons of deferral in this study were underweight, hypertension, allergic disorders and tattooing.

The loss of healthy donor can be reduced with regular health check-up and proper management

with follow up for temporarily deferred donors so that they can be reverted back to donor pool.

11.58% were permanent deferral cases. The most common cause of permanent deferral was Hepatitis B consisting 3.9% followed by Hepatitis C infection (2.9%). Previous studies showed that Hepatitis B infection was a major cause of permanent deferral among Indian population. [20]

### Conclusion

The knowledge of the causes and incidence of donor deferral at a specific area helps in blood donor selection particularly in cases of temporarily deferred young donors who can be reverted to donor pool. This helps in the development of better strategies to reduce the loss of blood donors and also ensuring safe blood and blood products for the recipients.

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