

Blood donor deferral pattern as an important tool for blood safety - A three year retrospective study in a tertiary care teaching hospital in rural eastern Uttar Pradesh, India

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How to citation this article: Dr. Saurabh Gupta, Dr. Siddharth Gangwar, Dr. Aarti B. Bhattacharya, Dr. SNS Yadav, “Blood donor deferral pattern as an important tool for blood safety - A three year retrospective study in a tertiary care teaching hospital in rural eastern Uttar Pradesh, India”, IJMACR- July - 2023, Volume – 6, Issue - 4, P. No. 129 – 136.

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Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Introduction: Blood centers aim for safe and adequate blood and blood components for all the needy patients. One has to take stringent actions for achieving of this goal. Besides need of the patients, blood centers should also address the needs and deficiencies of the donors, especially those who are deferred due to any cause either temporarily or permanently.

Methodology: This was a 3 year retrospective study where our main aim was to identify and estimate the donor deferral rate and reasons for their deferral. The donors were subjected to questionnaire based interview followed by physical examination, hemoglobin estimation. Post donation, screening for transfusion transmitted infections were carried out.

Results: Among a total of 5133 prospective donors, 609 were deferred and the deferral rate was 11.86% out of which 466 (76.51%) were deferred temporarily and 143 (23.48%) were permanently deferred. Anemia, Hepatitis B seroreactivity, antibiotic usage, poor vein and syphilis were among the most common causes for deferral.

Conclusion: Deferred donors should be appropriately informed, counseled and referred for proper treatment especially temporary deferred donors so as to increase the donor pool.

Keywords: Blood Donor, Deferral, Seroreactivity, Anemia.

Introduction

In today’s world, blood and blood components are as much in use as other pharmacological agents in treatment of patients, sometimes as supplements and at

times as the only life saving alternative. The blood centers should ensure that blood that is collected is not only safe for the patient, but also the health of the donor is not compromised for the patient's sake. These prospective donors should be of sound mind and are selected after going through strict criteria based on past and present medical history, questionnaire and physical examination followed by various microbiological and biochemical investigations. At any step, if any of the criteria is infringed, the individual is rendered disqualified from donating blood. These disqualified donors are called 'Deferred Donors'. These donors are deferred to warrant the safety of the donors and to avoid any threat to the recipients. The standard instructions which define the eligible donors are provided by the Drugs and Cosmetic Act 1940 for the standards for Blood Bank and Blood Transfusion Services [1,2].

There are ethical, medicolegal and psychological considerations to be followed before selecting a blood donor. The donors could be voluntary/unpaid donors, family/replacement donors, or paid donors. This study was done to analyze various causes and factors responsible for deferral of donor and educating and encouraging them to become prospective donors again, unless specified otherwise.

Objective

The study aimed at estimation of deferral rate and identification of reasons for deferral of blood donors.

Material & Methods

A retrospective study was conducted in Hind Institute of Medical Sciences, Barabanki in the Department of Blood Transfusion Services from July 2019 to June 2022 and donors that were deferred due to any cause were included in the study. The donors were subjected to detailed medical, physical, biochemical and

microbiological examination in complete secrecy as laid down in Standard Operating Procedures of the Institute before labeling them fit or unfit for donation. The selected donors were subjected to hemoglobin estimation by Haemocue method and then blood was collected post phlebotomy. The collected blood was then subjected to microbiological testing and when found negative for HIV I & II, Hepatitis B surface antigen, Hepatitis C antigen, Syphilis, and Malaria was stored for further distribution to recipients.

Inclusion Criteria

All donors that were deferred due to any cause

Exclusion Criteria

All eligible healthy voluntary and replacement donors.

The deferred donors were classified as permanently deferred donors or temporary deferred donors.

Results & Discussion

The study revealed following details:

A total of 5133 prospective donors were registered for blood donation of whom 5031 (98.01%) were males and 102 (1.98%) were females. 4524 (88.13%) individuals were selected for blood donation of whom, 4488 (87.43%) were males and 36 (0.70%) were females and 609 (11.86%) were deferred from donation of whom 543 (10.57%) males and 66 (1.28%) were females. Majority of the deferred donors belonged to 18-30 year age group in both males and females where it was 50.73% in males and 6.40% in females. The donors were deferred either for a temporary period or permanently. The causes for temporary and permanent deferral of the donors with their relative proportions are shown in Table 2. Most common cause of temporary deferral was anemia (48.60%) while most common cause of permanent deferral was Hepatitis B surface antigen seroreactivity (14.44%) The top five leading causes for all over

deferral were anemia (48.60%), Hepatitis B surface antigen seroreactivity (14.44%), prior antibiotic usage within 15 days (7.71%), poor vein for phlebotomy (5.09%) and Syphilis seroreactivity (4.59%). The various causes for temporary and permanent deferral with their relative proportions are listed in Table 3 and Table 4.

The donor deferral rate in the present study was 11.86% which is similar to study by WHO in South-East Asia region (11.5%) (interquartile range 4.5-11.6) [3], Vyas et al (11.8%) [4] and Rehman et al (12.4%) [5] and overseas in American studies by Zou et al (12.8%) [6], Custer et al (13.6%) [7] and in European studies by Lawson-Ayayi and Salami (10.8%)[8]. The clinical demand of blood units in India was estimated to be around 36.3 donations per 1000 eligible population [9], which is quite high compared to other developed countries, as such identification of eligible donors and reasons for their deferral, if any, is to be identified, and noted for follow up and persuade the donor to return, unless permanently deferred. The registered female donor population was very low (1.98%) compared to males (98.71%). Female donors were reported to be 1.55% by Krishna et al [10], 2.66% by Girish et al [11], 2.44% by Kujur et al [12], 2.5% by Priya et al [13], less than 10% in Mediterranean countries [3], about 1.8% in Saudi Arabia alone [14] but were about 45% in European countries [15]. Low female donor turnout is a major blow in achieving anticipated results in blood donation drives due social restrictions on females, local cultural practices, high prevalence of anemia in females, menstrual uneasiness, social stigmas, skepticism and lack of motivation for blood donation. Education and awareness are the only keys to these issues. The deferral in female donors turned out to be as high as 64.70%

where only 10.79% of males were deferred in our study. High deferral rates in females were also reported by Maheshwari et al (78.4%) [16] and Patil et al (48.38%) [17]. This may be due to high degree of negligence of women towards themselves leading to poor nutritional status and anemia (mostly iron deficiency anemia). More than half of the deferred donor population belonged to 18-30 years age group (57.13%), of which 50.73% were males and 6.40% were females. Patil S et al reported 52.34% [17], Arundhati S et al reported 57.82% [18], Sareen R N et al reported 60.5% [19] deferral in 18-30 years age group.

Our study had 76.51% donors who were temporarily deferred which were in correspondence with study by Patil et al (71.48%) [17] and Basawarajegowda et al (83.11%) [20]. 48.60% of the temporary donors were deferred due to anemia which is mostly iron deficiency, under nutrition and parasitic infestations in Indian scenario [21]. A number of other studies showed anemia as the most common cause as by Agarwal et al 56.92% [22], Naveen Agnihotri 56% [23], as well as in other countries with similar demography like India like Ekwere et al 39% [24], Halperin et al 46% [25]. It is notable to think that a large number of deferred donors can be brought back just by correcting their serum iron levels and alleviating a treatable cause like anemia due to iron deficiency either by iron-fortified food diet or medications. Government of India has initiated a national public welfare program “twelve by twelve initiative” to counter prevalence of anemia in general population.

Table 1: Gender distribution of registered donors, selected donors and deferred donors:

Donors	Make	Male%	Female	Female%	Total	%
Registered	5031	98.01%	102	1.98%	5133	100%
Selected	4488	87.43%	36	0.70%	4524	88.13%
Deferred	543	10.57%	66	1.28%	609	11.86%

Table 2: Causes of Temporary Deferrals with their relative proportions:

Causes	Number (n=466)	% Temporary deferral	% Total deferral (n=609)
Anemia	296	66.36%	48.60%
Antibiotic Usage	47	10.08%	7.71%
Poor Vein	31	6.65%	5.09%
Syphilis	28	6.00%	4.59%
Under Weight	11	2.36%	1.80%
Covid 19	7	1.50%	1.14%
Covid 19 Vaccine	6	1.28%	0.98%
Jaundice	5	1.07%	0.82%
Minor Wound/Trauma	5	1.07%	0.82%
Eosinophilia	5	1.07%	0.82%
Dog Bite	4	0.85%	0.65%
Infection	3	0.64%	0.49%
Lack of Sleep	3	0.64%	0.49%
Surgery	3	0.64%	0.49%
Excessive Menstruation	2	0.42%	0.32%
Under Age	2	0.42%	0.32%
Typhoid	1	0.21%	0.16%
HBSAg Vaccine	1	0.21%	0.16%
Chickenpox	1	0.21%	0.16%
Prior Donation	1	0.21%	0.16%
Tattooing	1	0.21%	0.16%
Alcohol Intoxication	1	0.21%	0.16%
Monkey Bite	1	0.21%	0.16%
Anti Rabies Vaccine	1	0.21%	0.16%

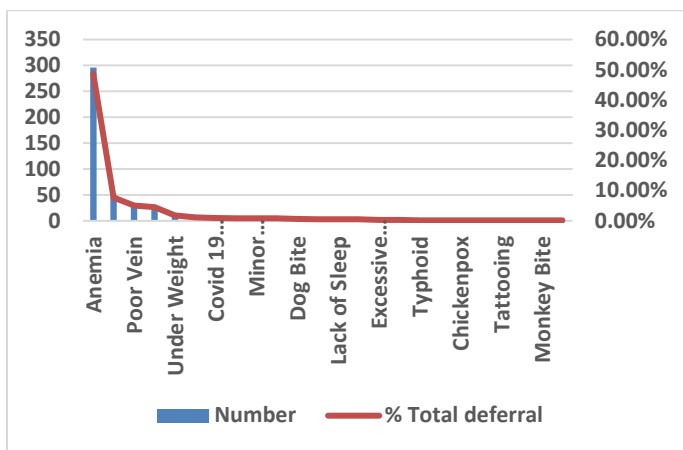


Figure 1: Causes of Temporary Deferrals with their relative proportions

Table 3: Causes of permanent deferrals and their relative proportions:

Causes	Number (n = 143)	% Permanent Deferral	% Total Deferral (n=609)
HIV I & II	3	2.09%	0.49%
HBSag	88	61.53%	14.44%
HCV	23	16.08%	3.77%
Polycythemia	16	11.18%	2.62%
Hypertension	13	9.09%	2.13%

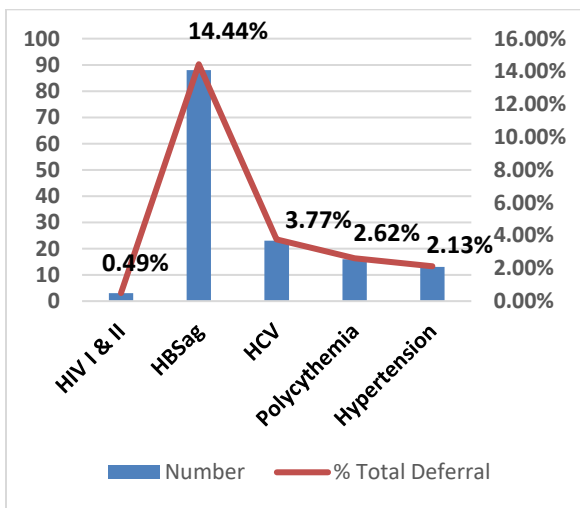


Figure 2: Causes of Permanent Deferrals and their relative proportions

About 23.31% of the donors were deferred permanently among which donors with seroreactivity for Hepatitis B surface antigen (14.44%) were most common. Donors deferred due to transfusion transmitted infections were 0.49%, 14.44%, 3.77%, 4.59% due to HIV, HBV, HCV

and Syphilis seroreactivity, respectively. Priya et al reported 0.93%, 18.95%, 0.31% and 1.65% [13] whereas Ekwere et al reported 2.9%, 2.7%, 2.3% and 0.8% [24]. In both the studies Hepatitis B seroreactivity donors

remain in majority among transfusion transmitted infections.

The present study revealed anemia (48.60%), HBSAg seroreactivity (14.44%), antibiotic usage (7.71%), poor vein for phlebotomy (5.09%) and syphilis (4.59%) as the top five leading causes for deferral. Among these,

anemia and prior antibiotics are readily reversible causes and donors should be pursued after an interval for reassessment. Syphilis has a deferral period of one year, if duly treated, and as such donor should be counseled for possible donation after a year.

Table 4: Causes of Transfusion Transmitted Infections (TTI) and their relative proportions:

Causes	Number (n = 142)	% TTI Deferral	% Total Deferral (n=609)
HIV I & II	3	2.11%	0.49%
HB Sag	88	61.97%	14.44%
HCV	23	16.19%	3.77%
Syphilis	28	19.71%	4.59%
Malaria	0	0%	0%

Table 5: Distribution of deferred donors in various age groups in males

Age distribution	Deferred Male Donors (n = 543)	% in Deferred Males	% in Total Deferred donors (n = 609)
18-30 years	309	56.90%	50.73%
31-40 years	139	25.59%	22.82%
41-50 years	62	11.41%	10.18%
51-60 years	33	6.07%	5.41%

Table 6: Distribution of deferred donors in various age groups in females:

Age distribution	Deferred Female Donors (n = 66)	% in Deferred Females	% in Total Deferred donors (n = 609)
18-30 years	39	59.09%	6.40%
31-40 years	19	28.78%	3.11%
41-50 years	06	9.09%	0.98%
51-60 years	02	3.03%	0.32%

Table 7: The five leading causes of deferral in donors:

Causes	N	% Total deferrals
Anemia	296	48.60%
HBSAg Positive	88	14.44%
Antibiotic Usage	47	7.71%
Poor Vein	31	5.09%
Syphilis	28	4.59%

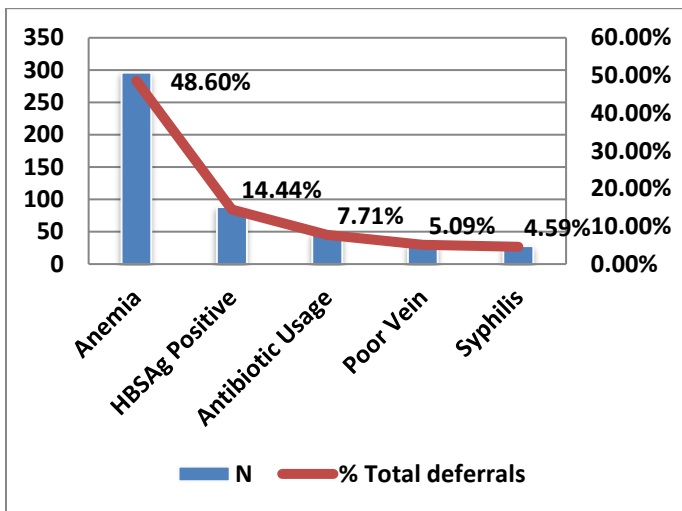


Figure 3: The five leading causes of deferral in donors

Conclusion

Overcoming the clinical demand for blood products in India is a major dilemma where deferral of potential donors adds to the burden. Deferring first time donors further de-escalates their morale and as such, they are less likely to return for donation within six months as compared to repeat donors. Deferred donors should be informed, counseled and referred for further workup so that they are appropriately treated and encouraged to return for donation. By studying the underlying factors, the donor pool can be extended by incorporating more of female population, recruiting donors beyond younger age group (>35 years) and by encouraging temporary deferred donors and replacement donors to become regular voluntary donors. Education, awareness and motivation are the need of the hour for successful blood donations.

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