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PATTERN OF BLOOD DONOR DEFERRAL IN A TERTIARY CARE CENTRE: AN ANALYSIS

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ABSTRACT

Blood transfusion plays a pivotal role in modern medicine and blood donation is a major prerequisite for it. Stringent screening criteria are required to accept or defer the blood donors. The objective of this study was to analyse the number of deferred donors and the various reasons for their deferral. A one year retrospective study was done in a tertiary care centre. The data of the deferred donors was retrieved and analysed for the various reasons of deferral. Out of the total 11978 donors, 11040 (92.2%) were accepted for bleeding and 938 (7.8%) were deferred for various reasons. Among the deferred donors, 56.7% were temporarily deferred and 43.3% were deferred permanently. The major cause of permanent deferral were transfusion transmitted infections (ttis) reactivity (40.3%) whereas temporary deferrals were due to anaemia (19.7%), hypertension (14.6%) and being underweight (10.3%). The study showed majority of the deferred donors were young adults with most common reason of deferral being TTIs reactivity. This emphasizes the need of raising awareness among the general population and thereby, introducing certain concrete measures to address the prevailing issue.

Keywords: *Blood Donation, Donor Deferral, TTIS Reactivity*

INTRODUCTION

The paucity of healthy, safe blood donors has always been a serious problem for blood banks worldwide (Bahadur *et al.*, 2009). Careful donor selection being vital to the process of blood donation is important for the safety of both the donor and the recipient (Rabeya *et al.*, 2008). Stringent screening criteria are required to accept or defer the blood donors. A number of potential donors are deferred either temporarily or permanently due to various reasons which differ from region to region. Hence, there is need to analyse the reasons for deferral in order to maintain the donor supply pool. This study is aimed to quantify the losses due to deferred donors and to analyse various reasons for their deferral.

MATERIALS AND METHODS

This study was carried out in the Department of Transfusion Medicine, in a tertiary care centre in North India. The data for over a period of one year (1st November 2010 to 31st October 2011) was retrieved from the records maintained in the department.

All the donors underwent a mandatory pre-donation screening process which included registration, history taking and physical examination done by trained medical personnel. The general appearance, body weight, pulse rate, blood pressure and haemoglobin levels were noted and history of jaundice, needle pricks, alcohol intake and medication was also taken. The donor selection criteria provided in the Technical Manual by Director General Health Services, Ministry of Health and Family Welfare, Government of India (Saran, 2003) were strictly followed to select or defer the donors on the basis of temporary or permanent reasons. Deferred donors were further segregated into three major groups: Pre donation deferral including deferral on the basis of history taking and physical examination, intra-bleed deferral due to syncopal attack and unwillingness of the healthy donors due to the fear just prior to phlebotomy and finally the post donation deferral which included all the Transfusion Transmitted Infections (TTIs) reactive cases. The blood units collected post donation that were found to be TTI's

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reactive were included in this category. The blood units thus obtained were rejected and the concerned donors were informed telephonically about their reason of deferral and were also appropriately provided guidance for further treatment. Enzyme Immuno Linked Sorbant Assay (ELISA) was done to test for Anti-HCV antibody, HbsAg and HIV reactivity by chemiluminescence method (Ortho ECi). Spot card tests were used for detection of Anti-TP (syphilis) antibody and malarial antigen (PAN pLDH).

RESULTS AND DISCUSSION

Results

A total of 11978 donors were screened for blood donation during the study period, of which, 3363 (28.1%) were replacement donors and 8615 (71.9%) were voluntary donors. Majority (67.4%) of the donors presented in 18–35 years age group. Males outnumbered females in blood donation comprising 99.2% of the total donor pool with females making up the numbers with only 0.8% [Table 1].

Table 1: Comparison between male and female donors (n = 11978)

Males (n = 11844)		Females (n = 134)	
Selected	Deferred	Selected	Deferred
10960 (92.5%)	884 (7.5%)	80 (59.7%)	54 (40.3%)

Out of the total donors, 92.2% were accepted for bleeding and 7.8% were deferred for various reasons. Replacement donors were more frequently deferred in comparison to voluntary donors (9.2% vs. 4.6%). Among the deferred donors, 56.7% (n=531) were temporarily deferred and 43.3% (n=407) were deferred permanently (deferral during screening and due to TTI reactivity). Pre donation deferral included 56.8% cases (n=532) and thus contributing the highest percentage in the total deferral pool. The details are shown in figure1. Post donation deferral due to TTI's reactivity was the most common reason among the deferred donors accounting for 40.3% of the total deferred cases followed by pre donation deferral due to anaemia (19.7%), hypertension (14.6%) and being underweight (10.3%). Other Less common causes included medical illness, alcohol intake, tattooing, poor veins and recent medication. The various reasons for deferral in donors are tabulated in Table 2.

Table 2: Deferral reasons in blood donors

Deferral reasons(in descending order) including the pre donation, intra- and post donation deferrals	No. of deferred donors (n = 938)	% of deferred donors
TTIs	378	40.3%
Low haemoglobin	185	19.7%
High blood pressure	137	14.6%
Underweight	97	10.3%
Medical illness	32	3.4%
Poor veins	18	1.9%
Addiction	15	1.5%
Needle pricks/Tattooing	09	0.9%
Intrablood deferral	28	2.9%
Miscellaneous*	39	4.1%

*drug intake(14), last donation<3 months(07),high risk(03),lactation(03) and others(12)

Transfusion transmitted infections were found to be present in 40.3% of total deferred donors representing 3.1 % (n=378) of the total donor population (n=11978) in our study, reflecting the high prevalence of these infections in our set-up. Among these most were anti HCV reactive (1.28%, n = 154) followed by HBsAg reactive (0.86%, n = 103), VDRL reactive (0.78%, n = 94), HIV reactive (0.21%, n = 26) and a single positive case of malarial antigen accounting for only 0.01% of the total TTIs.

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Most of the deferred donors were young adults (18-35 yrs.) as majority of the donors screened in our study presented in this age-group. Comparison of common causes of deferral noted in different age groups is shown in Figure 2.

The frequency of deferral was higher in females in comparison to males. The most common cause of deferral among males was TTIs reactivity while females were mostly deferred due to low haemoglobin (Hb) levels. The comparison of common causes of deferral between males and females is depicted in Figure 3.

Discussion

This retrospective study has been undertaken to study the profile of blood donors in a tertiary care centre providing an insight into the various deferral reasons. In our study, the overall deferral rate was found to be 7.8% out of the total screened donors. Rabeya *et al.*, (2008), Sunder *et al.*, (2010) and Bahadur *et al.*, (2009) found deferral rates of 5.6%, 6.0% and 9.0% respectively which is in concordance with our study even though post donation deferral was not part of their study. However, this rate is lower in comparison to the other studies done in the past who reported deferral rates in the range of 11.6% to 14.4% (Agnihotri, 2010; Zou *et al.*, 2001; Custer *et al.*, 2004; Lim *et al.*, 1993).

Table 3: Comparison of overall deferral rates among the deferred donors in various studies

Various studies	Overall deferral rates (%)
Rabeya <i>et al.</i> ,	5.6%
Sunder <i>et al.</i> ,	6.0%
Bahadur <i>et al.</i> ,	9.0%
Agnihotri	11.6%
Zou <i>et al.</i> ,	12.8%
Custer B <i>et al</i>	13.6%
Lim <i>et al.</i> ,	14.4%
Present study	7.8%

Temporary deferrals formed 56.7% of the total deferral pool AND permanent constituted 43.3% of the deferred cases. Various other studies have also shown temporary deferrals more than the permanent deferrals though the rate of permanent deferrals in their studies is less than that in our study (Sunder *et al.*, 2010; Custer *et al.*, 2004; Arslan, 2007). The reason behind this is that our study also included the post donation deferrals comprising of TTIs reactive cases as permanent deferrals. However, permanent deferrals only on the basis of history taking were 3.1% of the total deferred cases which was lower in comparison to the above mentioned studies. In our study amongst the pre donation deferrals, low Hb was found to be the most common reason (19.7% cases). Various studies done in the past have also shown similar result of low haemoglobin being the most common reason for deferral ranging from 20.7% to 60% of the cases (Sunder *et al.*, 2010; Agnihotri, 2010; Custer *et al.*, 2004; Arslan, 2007). This higher deferral rate only on the basis of low haemoglobin shows the high prevalence of anaemia in our set-up and thereby resulting in loss of valuable donors. The second and third most common pre donation deferral reasons found in our study were high blood pressure (14.6%) and being underweight (10.3%) respectively.

Table 4: Most common pre donation deferral reasons among various studies

Various studies	Common deferral reasons
Agnihotri	Low Hb and hypertension
Charles <i>et al.</i> ,	Low Hb and hypertension
Bahadur <i>et al.</i> ,	Low Hb and low weight
Zou <i>et al.</i> ,	Travel to malaria area and miscellaneous blood exposure
Chaudhary <i>et al.</i> ,	Low weight and low Hb
Present study	Low Hb and hypertension

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Various studies have found different reasons for deferral in blood donors reflecting on the variation in donor population and eligibility criteria used in different parts of the world. Agnihotri (2010) (low Hb and hypertension), Charles *et al.*, (2010) (low Hb and hypertension), Bahadur *et al.*, (2009) (low Hb and low weight), Zou *et al.*, (2001) (travel to malaria area and miscellaneous blood exposure), and Rabeya *et al.*, (2008) (high blood pressure and medical illness), Chaudhary *et al.*, (1995) (low weight and low Hb) have cited various other common reasons for deferral in their respective study population.

In the present study, intra-donation deferrals were 2.9% of the total deferred donors which is almost similar to the findings of Custer *et al.*, (2004) who reported higher rate of mis-collection leading to 3.8% cases. Whereas Sunder *et al.*, (2003) and Farrales (1997) reported lower rates of unsuccessful phlebotomy (0.006% and 0.5% respectively).

Post donation deferrals constituted 40.3% of the total deferred cases on the basis of TTI's reactivity. The prevalence of TTI's among our reported donor population was 3.1% of total donor population screened in which reactivity for HCV was the highest accounting for 1.28% of cases followed by HBsAg (0.86%), VDRL (0.78%) and HIV reactivity (0.21%). These post donation deferred donors were informed telephonically about their reason for deferral and also were given appropriate guidance for their treatment. Kaur *et al.*, (2010) found 1.7%, 0.8% and 0.6% prevalence rates of HBV, HCV and HIV respectively. Singh *et al.*, (2004) reported prevalence of HBV (1.8%), HCV (0.5%) and HIV to be 0.8%.

Deferred donors were also analysed according to their sex and age. The frequency of deferral was higher in females in comparison to males (40.3% vs 7.5%) in our study. The leading reasons for deferral in females were low Hb followed by low weight and TTI's reactivity. Among males, TTIs reactivity was the major cause for deferral followed by low Hb. In the study done by Arslan (1995), female donors were deferred more frequently than male donors (25.8 vs. 13.3%) who are similar to our study. The main reason for deferral in his study was common cold and/or sore throat or elevated temperature in male donors and low haemoglobin in females.

Most of the deferred donors in our study presented in 18-35 years age group (67.4%) and the most common reason for deferral was TTIs positivity (post donation deferrals). The alarming presence of TTIs in this age group which is considered to be as healthy population and can significantly contribute to voluntary, non remunerated blood donor pool warrants certain stringent measures to be taken in order to create awareness among the general population for ensuring their health.

There is also a need for certain efforts to be introduced in the general population to address prevailing issue of anaemia. Repeat donors can also be advised on regular intake of iron supplements to maintain their body iron stores so that they can add up to the voluntary donor pool. High prevalence of anaemia in our female population can be explained by the fact that this group of population is more prone to depleted iron stores and consequently low Hb levels. Donors deferred due to high BP should be guided to change their life style and to take further treatment from a physician and return back on normalization of their blood pressure levels. Donors harbouring fear of phlebotomy could also be counselled and encouraged for donating blood at regular intervals.

Conclusion

The study showed that most of the donors were young adults and the common reasons for deferral were post donation deferrals consisting of TTIs reactivity, followed by pre donation deferrals including anaemia, hypertension and low weight. This emphasizes the need to introduce the donor recruitment and retention strategies. The potential donors deferred due to temporary reasons should be referred for further evaluation and treatment and also be advised to donate at a later date to ensure proper maintenance of the donor supply. Along with this, there is need of raising awareness among the general population, bringing about lifestyle changes, clarifying myths about blood donations in order to ensure safe and healthy donor supply pool.

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REFERENCES

- Agnihotri N (2010)**. Whole blood donor deferral analysis at a center in Western India. *Asian Journal of Transfusion Science* **4**(2) 116–22.
- Arslan O (2007)**. Whole blood donor deferral rate and characteristics of the Turkish population. *Transfusion Medicine* **17** 379-383.
- Bahadur S, Jain S, Goel RK, Pahuja S and Jain M (2009)**. Analysis of blood donor deferral characteristics in Delhi, India. *Southeast Asian Journal of Tropical Medicine Public Health* **40**(5) 1087–1091.
- Charles KS, Hughes P, Gadd R, Bodkyn CJ and Rodriguez M (2010)**. Evaluation of blood donor deferral causes in the Trinidad and Tobago National Blood Transfusion Service. *Transfusion Medicine* **20**(1) 11–4.
- Chaudhary RK, Gupta D and Gupta RK (1995)**. Analysis of donor-deferral pattern in a voluntary blood donor population. *Transfusion Medicine* **5** 209-12.
- Custer B, Johnson ES, Sullivan SD, Hazlet TK, Ramsey SD, Hirschler NV, Murphy EL and Busch MP (2004)**. Quantifying losses to the donated blood supply due to donor deferral and miscollection. *Transfusion* **44**(10) 1417–26.
- Farralles FB, Stevenson AR and Bayer WL (1997)**. Causes of disqualification in a volunteer blood donor population. *Transfusion* **17** 598-601.
- Kaur G, Basu S, Kaur R, Kaur P and Garg S (2010)**. Patterns of infections among blood donors in a tertiary care centre: A retrospective study. *National Medical Journal of India* **23**(3) 147-149.
- Lim JC, Tien SL and Ong YW (1993)**. Main causes of pre-donation deferral of prospective blood donors in the Singapore blood transfusion service. *Annals of the Academy of Medicine, Singapore* **22** 326-34.
- Rabeya Y, Rapiaah M, Rosline H, Ahmed SA, Zaidah WA and Roshan TM (2008)**. Blood pre-donation deferrals-a teaching hospital experience. *Southeast Asian Journal of Tropical Medicine Public Health* **39**(3) 571–574.
- Saran RK (2003)**. *Transfusion Medicine Technical Manual*, 2nd edition (New Delhi: Mehta Offset).
- Singh B, Kataria SP and Gupta R (2004)**. Infectious markers in blood donor of East Delhi: prevalence and trends. *Indian Journal of Pathology and Microbiology* **47**(4) 477-9.
- Sunder P, Sangeetha SK, Seema DM, Marimuthu P and Shivanna N (2010)**. Pre-donation deferral of blood donors in South Indian set-up: An analysis. *Asian Journal of Transfusion Science* **4**(2) 112-5.
- Zou S, Musavi F, Notari EP, Rios JA, Trouern-Trend J and Fang CT (2001)**. Donor deferral and resulting donor loss at the American Red Cross Blood Services, 2001 through 2006: *Transfusion* **48**(12) 2484-6.