REASONS OF DONOR DEFERRAL FOR A SINGLE DONOR PLATELETPHERESIS IN A PUBLIC SECTOR BLOOD TRANSFUSION CENTRE OF LAHORE: A CROSS-SECTIONAL STUDY

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Abstract

Background & objective: Plateletpheresis is a process by which platelets are extracted from a donor. Deferred donors are those who are not eligible to donate blood due to medical history or serological testing. The aim of this study was to examine the reasons of donor deferral for a single donor plateletpheresis in a public sector blood transfusion centre of Lahore

Methods: This cross-sectional study was conducted at department of Haematology and Transfusion Medicine, University of Child Health Sciences Lahore including 50 plateletpheresis donors who voluntarily came for donation. The donor questionnaire included brief medical history, general physical examination. Haematological parameters such as haemoglobin and the donor blood screening was done to determine fitness for the plateletpheresis. The reasons for deferral of donors were noted after all work-up was done. Informed consent was taken before plateletpheresis using COM.TEC Cell Separator instrument. Data were managed and analysed using SPSS version 20.

Results: Of 50 donors, 34 donors were approved for procedure and 16 were deferred due to different temporary and permanent reasons. Donors were aged between 18 to 50 years. Major reason for temporary deferral was poor venous access (n=7, 14%), followed by low haemoglobin value (n=4, 8%). Permanent reasons for deferral were seropositive for HbsAg (n=2, 4%), seropositive for HCV (n=4, 8%) and tattoo (n=1, 2%).

Conclusion: During donor selection for plateletpheresis, transfusion services should be very careful regarding donor safety measures and should consider low haemoglobin level as the reason of donor deferral. Screening for endemic transmissible infectious diseases in Pakistan should also be considered.

Key words: blood transfusion, donor deferral, plateletpheresis, blood donor, donor exclusion, donor screening

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Platelets play a major role in primary haemostasis and are transfused to patients for a number of reasons to stop or prevent the life-threatening bleeding.[1] Platelets are collected either by plateletpheresis (Single donor platelets) or by pooling separated blood products from whole blood collection (Random donor platelets). There is device used in blood donation known as cell separator which separates the platelets and returns the unwanted components of blood to the donor.[1,2] This procedure takes 40-90 minutes. Platelets obtained by an apheresis procedure provide an equivalent of six to eight units whole blood derived platelets. "Platelet-pheresis is a procedure of donor apheresis in which the platelets in the donor blood are separated by passing through an apparatus and returning the remainder blood into donor blood circulation.[3]

The most commonly used instruments employ one of two methods of centrifugation: one is intermittent

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flow centrifugation (IFC) in which blood is drawn, required component is separated and remaining blood is reinfused to donor with same needle and one cycle is complete. It requires only one venepuncture and many cycles are required for therapeutic endpoint. Other is continuous flow centrifugation (CFC) which withdraws, processes and return the blood to donor at the same time.[2] A sufficient supply of safe blood from healthy blood donors is required for blood transfusion, which is a life-saving treatment. Deferred donors are those who are not eligible to donate blood. Donors are either temporarily or permanently postponed. Donor selection involves three main steps: the donor's medical history, physical examination, and serological testing.[4-7]

Donors were postponed after taking medical history, physical examination and serological testing.[4] Any of these factors may exclude a potential donor from the donation system. Postponed (deferred) donors should be clearly informed of the reason and encouraged to return as soon as possible. Based on this information, in our study, we aimed to analyse the reasons for the deferral of single donor plateletpheresis procedure so that donor safety can be enhanced and they are guided to overcome their phobia of donation by seeing facts.

METHODS

This cross-sectional study was conducted in Department of Haematology and Transfusion medicine at the University of Child Health Sciences, The Children's Hospital Lahore from October 2021 through January 2022. The study population included all donors who came voluntarily to donate platelet using plateletpheresis procedure. Age, gender, voluntary intention, haemoglobin, red cell indices and platelet count were noted. We used plateletpheresis donor criteria as: age: >18 and <60 years old, weight: >50kg, Haemoglobin: >12.5g/dl, Haematocrit (HCT):>38%, Platelet count more than 150,000/µl, good venous access, ABO identical donor for patient preferred, no active illness, no consumption of non-steroidal anti-inflammatory drugs for last seven days, negative test for HIV, hepatitis B, hepatitis C, syphilis and malarial parasite, body temperature: 37.5°C, pulse rate: 50-100 beats/minute, systolic blood pressure: 100-140mmHg, diastolic blood pressure: 60-100mmHg and there should not be more than two procedures per week with an interval of 3 days.

All plateletpheresis procedures used COM.TEC-Fresenius Kabi and Trima Accelerator. Donors who were selected after clinical history, complete blood count, serological testing were examined for proper venous access. After donor selection, disposable kits were fitted on cell separator and priming done. Double lumen access was used for kit. Following collection of procedure, each unit was allowed to rest for one hour for optimum disaggregation of platelets before issuance. Staff used a specifically designed form for recording all adverse events including vasovagal reactions and citrate toxicity. Data were transferred to SPSS version 20 for management and analysis. Frequency distribution was generated to count reasons for donor deferral and percentages were calculated.

RESULTS

Of 50 donors applied for plateletpheresis donation during the study, all were males. Out of these donors, 34(68%) were selected for the plateletpheresis procedure on Fresenius kabi \COM.TEC and 16 (32%) were deferred because of the different temporary and permanent reasons. Donors were aged between 18 to 50 years and were divided into four age groups (Table 1). Most common blood groups among the donors were B-positive (n=14, 28%) followed by B-negative (n=12, 24%). The majority (32) of donors were Rh positive. The mean and standard deviation of the weight of donors was 68.5±15.2; Haemoglobin was 14.5 ±1.9, platelet count was 237.6±62.5, WBC count was 8.4 ± 3.5 respectively.

Applications of 16 donors were deferred due to different reasons. Reasons for the postponement were

Table 1: *Age distribution of donors voluntarily applied for plateletpheresis (n=50)*

Age (years)	Number	Percentage
18-28	18	36%
29-38	25	50%
39-48	05	10%
48-58	02	04%

divided into permanent and temporary reasons (Table 2). The main reason for the temporary donor delay was poor venous access (n = 7, 14%). Other reasons for the temporary delay were haemoglobin level below the acceptable limit of 12.0g / dl (n = 4, 8%), low platelet count (n = 4, 8%), leucocytosis (n = 1, 2) %), medical history (n=3, 6%), history of blood transfusions, vaccinations (n = 3, 6%), fever (n = 1, 2%) and anxiety (n =1, 2%) (Table 2). Moreover, seropositive for malarial parasite (n=2, 4%), seropositive for VDRL (n=1, 2%), history of jaundice (n=1, 2%), history of donation refusal after questionnaire (n=2, 4%), being underweight (n=4, 8%) and high blood pressure (n=1, 2%) were the temporary reasons for donor deferral. Reasons for permanent deferral included seropositive for Hepatitis B virus (n=2, 4%), seropositive for hepatitis C virus (n=4, 8%) and tattoo/piercing (n=1, 2%). (Table 2).

- There were multiple responses reported by individual participants

Table 2: *Reasons for Temporary and permanent donor deferral among those applied for plateletpheresis in Children Hospital Lahore (n=50)*

Reasons of donor deferral	
Temporary reasons	**Number**
Low haemoglobin	4
Low haematocrit	4
High white blood cell count	1
Low platelet count	4
History of transfusion last 12 months	2
History of taking antibiotics, aspirin	2
History of vaccination in last 6 months	1
Poor venous access	7
Underweight	4
Fever	1
Anxiety	1
History of jaundice in past 6 months	1
History of discomfort in last donation	1
Donation refusal after questionnaire	1
Seropositive for malarial parasite	2
Seropositive for syphilis	1
High blood pressure	1
Permanent reasons	
Seropositive for HbsAg	2
Seropositive for HCV	4
Tattoo/piercing	1

DISCUSSION

Transfusion of blood products is an important issue. In lieu of many advances in the medical field, whole blood transfusions are recommended in relatively limited cases. Platelet transfusions are especially important in preventing bleeding and treating bleeding. Platelets can be made in two ways: from random donating platelets and single platelet donations using plateletpheresis.[2] However, in plateletpheresis, platelets can be derived in higher amounts than random donor platelets.

This study examined the reasons of deferral for plateletpheresis. In previous studies, high deferral rate was attributed to poor venous access.[3] Our study also showed poor venous access as the major factor for temporary deferral followed by the history of medication including aspirin. Anaemia was found to be the third factor for deferral in our study. These findings are consistent with previous studies showing low haemoglobin as the main factor for donor deferral.[1,2] Underweight and low platelet count has same deferral frequency as that of haemoglobin. Half of the donors were deferred because of the low platelets count.[9-11] Reasons of deferral for plateletpheresis was almost the same as in previous studies. Other causes of temporary deferral was high WBC count (2%) and in previous study also leucocytosis was the major reasons for deferral.[6]

A study performed in Indira Nagar Lucknow, India showed that 14% of donors had haemoglobin values lower than normal 12.0g/dl.[5] Finding low haemoglobin levels in our population is a common occurrence. Authors reported that more than half of the variation was due to low platelet counts indicating that low platelet counts were more common than low haemoglobin concentrations. Tondon et al. in India showed that the retardation rate of plateletpheresis suppliers was 25.4%,[9] as opposed to which observed by other studies (lower retardation rate of 10.6%). Most reasons for deferral are temporary (>90%).[8,9]

Dogu et al. in Turkey reported that most common reason was poor vascular access (25.7%) in donors.[4] The second most common reason was unusual laboratory values. Leucocytosis was the most common

abnormal laboratory parameter (36%) and it was followed by low haemoglobin (35%).[4] According to their findings, third most common reason was drug use (14.7%). Underweight was also a common cause for deferral (8.6%). Hypertension/ hypotension before the proce-dure was also common. [4,5]

CONCLUSIONS

This study reported a similar pattern of donor retardation as in previous studies. We conclude that when selecting donors, the hospital should be very careful regarding donor safety. The donors should be properly counselled about the reason of their temporary or permanent deferral so that potential donors can be reversed and availed for this procedure next time. Transfusion services should consider screening for endemic transmissible infectious diseases in Pakistan.

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