Research article

Distribution of Mega-Platelet Units (Platelet Apheresis) During Four Years at Blood Bank and Transfusion Center LUMHS Hyderabad

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Abstract
The transfusion of constituents drawn from human blood strengthens up-to date medicine. But, transfusion is not devoid of hazards. Platelet transfusions are rising more speedily than the transfusion of other parts. Single-donor apheresis clusters are spent favorably commonly known as single donor platelet procedure; blood is obtained from a donor in anticoagulant solution. Benefit of solo provider platelets upon shared donor platelets are of decreased hazard of bacterial infection. To determine the distribution of platelet concentrates from healthy donors to various units of LUH Hyderabad. This cross sectional and descriptive study was done at Blood bank and transfusion center, Diagnostic and research (D&R) Laboratory LUMHS Hyderabad from March 2012 to February 2016. Platelet apheresis was processed in 691 healthy males; age between 21 to 45 years. Apheresis was done by cell separators (Fresenius Hemo Care GmbH, Germany and Trima accel United States). And were distributed in different units of Liaquat University Hospital, Hyderabad, i.e. Oncology 176(25.47%), Medicine 169 (24.45%), Surgery 126 (18.23%), Gynecology and Obstetrics 115 (16.64%), Intensive Care Unit (ICU) 61 (8.82%), Casualty 44 (6.36%). Reviewing of blood component's demand is an effective workout to decrease the figure of inapplicable transfusions, given the threats of transfusions despite progresses in preparing them harmless.
KEYWORDS: Platelet apheresis, Transfusion, Distribution, Units.

Introduction
The transfusion of constituents drawn from human blood strengthens up-to date medicine, But, transfusion is not devoid of hazards[1]. Platelet transfusions are rising more speedily than the transfusion of other parts. Single-donor apheresis clusters are spent favorably[2], commonly known as single donor platelet procedure; blood is obtained from a donor in anticoagulant solution. Platelets suspended in plasma are retained as end product and the remaining constituents i.e. red blood cells and plasma are returned to the donor. A single unit of platelet collection manufactured from a unit of entire blood contains, on the average, 7.5 x 10^{10} platelets and must rise the platelet tally by 5 to 10 x 10^{9}/L (5,000 - 10,000/mL) in a 70 kg beneficiary. Apheresis platelet assembles normally contain 3 - 6 x 10^{11} platelets, subject on compendium preparation. Therefore, 6-times more platelets can be collected at one time through the apheresis than through whole blood donation. Benefit of solo provider platelets upon shared donor platelets are of decreased hazard of bacterial infection3. Today 50% to 80% of patients with leukemia are given platelet apheresis.

Indications For Platelet Transfusion:
Leukemia, Aplastic Anemia, AIDS, Hyper-spleenism, Sepsis, Bone Marrow Transplant, Radioactivity treatment, Organ Transplant, Cardio-pulmonary by pass and Dengue Fever.

Purpose/Objectives:
To determine the distribution of platelet concentrates from healthy donors to various units of LUMHS Hyderabad.

Material and Methods:
This cross sectional and descriptive study was done at Blood Bank and Transfusion Center Diagnostic & Research Laboratory, LUMHS Hyderabad, Samples were collected from 691 fit and fine first time voluntary and alternate platelet apheresis donors age between 21 to 45 years from March 2012 To February 2016, Details of platelet apheresis were described to each donor who gave due consent earlier the process. Donors were selected based on the criteria: weight more than 50 kg, as a minimum 3 months from last whole blood donation or 3 days from previous platelet apheresis, hemoglobin above 12.5 gm/dl, platelet count above 200 x 10^{3}/cmm, absence of any illness, no any intake of

non-steroidal anti-inflammatory drugs for last 7 days, Not taken Aspirin for last 72 Hours, negative viral profile i-e HIV, HBV, HCV, Syphilis and Malaria, ABO identical donor for the patient and adequate venous accesses and with **Request Receiving Protocol as:** Patient Name, Ward/Bed # and Arrange One Mega Unit. Donor-cell separator choice was depend on the availability of a specific separator at the time of the procedure. Procedure was performed on following cells separators platelet apheresis machines:

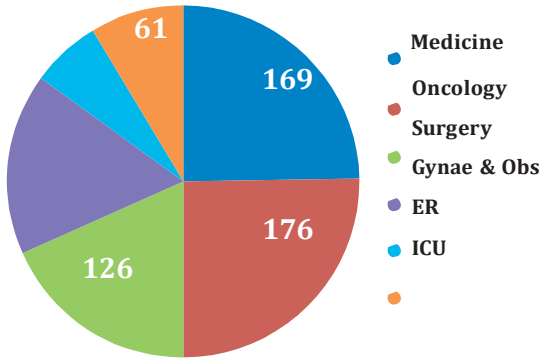
1. Fresenius separator (COM.TEC), DN (Fresenius Hemo Care GmbH, Bad Homburg V.D.H, Germany)
2. Trima accel Automated Blood collection System

Result

A total of 691 donors were there and platelet apheresis were used in the following departments[4] of attached Liaquat University Hospital Hyderabad.

No	Department	No Of Plateletpheresi	Percentage
01	Medicine	169	24.45%
02	Oncology	176	25.47%
03	Surgery	126	18.23%
04	Gynaecology and Obstetrics	115	16.64%
05	Emergency Room	44	6.36%
06	Intensive Care Unit (ICU)	61	8.82%
	Total	691	100%

Distribution



Discussion

Platelet apheresis is practiced all over the world. Platelet manufacture must comprise widespread guidance of clinicians (on proper component use) as it is an invasive procedure, but it requires a greater dedication to the donor because of the prolonged duration of the procedure as compared to whole blood collection. The primary goal of platelet transfusion is to ensure that it is done safely and used appropriately for specific clinical condition, thereby avoiding the unnecessary use of donor blood in clinical practice. This study revealed that platelet apheresis for obtaining platelet concentrates can be used in many clinical situations.

Transfusing patients with thrombocytopenia to sophisticated platelet counts has several prospective benefits; as one of the probable advantage is to diminish the frequency of hemorrhagic situations.

Attention should also be given to the long-lasting sustainability of Platelet manufacturing systems, especially given the extraordinary per unit costs, a consideration of the blood service's need to regain an increasing percentage of charge8. One important benefit of platelet apheresis is that no further supervision is required for the outcome to be labeled as 'leukoreduced'. Leukocytes must be $<5 \times 10^6$ per concentrate corresponding to USA standards and $<1 \times 10^6$ per concentrate according to European standards[9]. One of the negative point is that Platelet concentrates have the shortest expiry time of all routine blood components; and they are also associated with risk of bacterial growth particularly beyond the shelf life of 5-day. As demand for platelet transfusions is continuing increasing, donor availability poses a major challenge for blood banks. For that ideal managing of platelet supply, a close relationship between clinicians, blood banks and transfusion specialists is compulsory[10].

Comparative Studies

A study conducted by Trivo et al[7] in INDONESIA used 204 Platelet apheresis from 2009-2013 in oncology department in another study by John P. Pitman et al[8] in NAMABIA used 771 Platelet apheresis from 2006-2011 in oncology department. A local study conducted at ISLAMABAD by Samina Tufail Amanat et al[3] used 200 Platelet apheresis from 2010-2014 in Dengue fever while a study in trauma center of INDIA by Arulselvi S et al4 used 950 Platelet apheresis in only one year.

Limitations

There is no stock available due to high cost and shelf life, Non availability of volunteer's donors, dependent only patient's donor don't know the actual requirement of platelets in wards.

Conclusion

The platelet apheresis procedure is considered relatively safe. However, several complications may occur. It forms an important adjuvant to blood bank inventory. It is also useful in wide variety of clinical situations; the need of platelet concentrates obtained from single donors by apheresis is growing[5]. Transfusing patients with thrombocytopenia to sophisticated platelet counts has several prospective benefits; as one of the probable advantage is to diminish the frequency of hemorrhagic conditions.

Results of this study we praise that apheresis donors should be observed for post-donation haematological issues. Donors

with noteworthy decrements should be reviewed successively to exclude or, if necessary, treat properly. The generation of high-dose apheresis concentrates has financial associations for transfusion services and blood centers.

Thus, in end, sensible execution of guidelines for the use of various blood products may help decrease unsuitable use of blood constituents and guarantee their availability to larger number of needy patients as well. Knowledge and teaching amongst all those considering patients would go a long way in bringing the percentage of appropriate transfusion to nearly 100%. Auditing of blood order is a productive practice to minimize the number of inappropriate transfusions, given the risks of transfusions despite advances in making them safe[6].

Acknowledgment

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