International Journal of General
Medicine and Pharmacy (IJGMP)
ISSN(P): 2319-3999; ISSN(E): 2319-4006
Vol. 4, Issue 3, Apr - May 2015, 11-14

International Academy of Science,
Engineering and Technology
Connecting Researchers; Nurturing Innovations

OPTIMISE RATIONALE USE OF PLATELET RICH CONCENTRATES: A MYTH OR REALITY: WAY FORWARD

ALEEM JAN[1], ARSHAD SIDIQUE[2], FAHMIDA AKHTAR[3] & AROOJ RASHID[4]

[1]Additional Professor, Department of Clinical Haematology SKIMS J&K, India

[2]Senior Resident, Department of Immunohaematology and Transfusion Medicine SKIMS Srinagar J&K, India

[3]Head, Department of Immunohaematology and Transfusion Medicine SKIMS Srinagar J&K, India

[4]Postgraduate Scholar, Soura Srinagar, J&K, India

ABSTRACT

Platelet support is backbone of tertiary care hospital in particular those performing Transplants and instituting chemotherapy protocols. Prepration of platelets needs logistics in form of donors, separation equipment, storage ambience and shaker. End point being its rationale use, which otherwise could lead to platelet refractoriness. Guidelines cum recommendations of this study shall help promote rationale use

KEYWORDS: SDAP, PRCS, Refractoriness

INTRODUCTION

Platelet are produced in bone marrow from mature megakaryocytes and circulate in blood as disc shaped enucleate particles 2-4micromillimeter in diameter with mean platelet volume of 7-9 fl with a count of 150-450. They contain RNA, a canilicular system and several different types of granules that play an important role in formation of blood clots and inflammatory response. The haematopiotic growth factor thrombopiotin (THPO) is primary regulator of megakaryocyte growth and platelet number. Average life span of platelets is 5-9 days and finally sequestered in the spleen. Platelets play an important role in primary haemostasis.

Preparation and Storage

Platelets are prepared from individual whole blood donation or form single donor apharesis (SDAP).Need to be put on an agitator or platelet shaker to maintain potency and efficacy. Stored platelets experience a progressive decline in function accompanied by characteristic morphologic changes, a process collectively called as platelet storage lesions, hallmark of which is change in shape size, release of granules, hike in lactate fall in ATP and PH.

MATERIAL AND METHODS

Thus far there have been numerous studies to unmask irrational use of platelet rich concentrates and all have substantiated it one way or the other. With an aim to audit and therefore optimise utilisation of platelet concentrates, a study was conducted at SKIMS, a tertiary care deemed university medical institute of north India in department of Blood transfusion and Immunohaematology from first October 2012 to 30th September 2013. Data for platelet prepration was obtained from departmental records. Platelets were stored for maximum period of five days at room temperature (22± ^{0}c) with continous horizontal gentle agitation in platelet incubator cum agitator.

Patient information was obtained from requisition forms and platelet issue record register.

Analysis: Requisitions received: 1722

Appropriate: 1586(92%)

Inappropriate: 136(8%)

Reasons for Inappropriate Requests

- Haemophilia 8%
- Vonwillibrand 2%
- ITP 7%
- TTP 2%
- Requisition with count>50,000(not bleeding) 35%
- Repeat morning evening requisition: 19%
- Requisition above 10 bags. 27%

DISCUSSIONS

This one year study was conceived to study utilisation of platelet concentrates. SKIMS is a tertiary care hospital and ranks apex among all tertiary care hospitals of Jammu and Kashmir. Platelet concentrates are transfused in wards and day care facility under strict guidance and supervision of experienced and trained personnel. Platelets are extracted as per SOPS in the department of blood bank.

1722 requisitions were studied during this period .7.8% requisitions were found to be inappropriate. 10 requisitions for haemophilia case, 3 for vonwillibrand disease were received although platelets are contraindicated when bleeding is as a result of coagulation factor deficiency. Also 10 requisitions for ITP and 3 for TTP were received although platelets are contraindicated when thrombocytopenia is due to platelet destruction or sequestration but for in situations of bleeding. Further there were requisitions in which more than 10 bags were requisitioned, which deprives genuinely deserving patient of this scarce resource. These requisitions of more than 10 bags might have been sent by new resident staff, who genuinely need priming on this subject on day one so as to facilitate rational use.

Our study is in conformity with observations of Gopal et al in which blood and component use was found to be appropriate in 90% of cases. K. saluja et al found 88% of platelet transfusions appropriate. Metz j j et al found 11% of platelet transfusions as inappropriate.

Internal audits form an integral part of quality control programme of any blood bank. Blood and its components are essentially drugs by law, thereby measures to ensure its appropriate use are to be in place so as to minimise health care cost, prevent wastage of resources, ensure needy receive it. Safe and secure transfusion prevents transmission of viral diseases and dreadful allergic reactions and their short and long term consequences. In summary audit followed by targeted education and preferably joining rounds of unit where a mismatch between required and actual need is observed by transfusion services.

Further platelet increment was calculated by formula: measured count increase x Body surface area divided by number of units transfused. Minimal platelet recovery to define a successful transfusion was considered if > $7.5x10^9$ at one hour and or $4.5x10^9$ at 20-24 hour corresponding rise in platelet count was not obtained.

Recommendations

- Hospital Transfusion committee must ensure that there are written local guidelines for the use of platelets in all clinical specialities where platelet transfusion takes place, like Haem-oncology, transplant unit, cardiac surgery, vascular surgery.
- Hospitals must educate all clinicians responsible for making decision to prescribe platelet transfusions.This could include consultant, Registrars and residents.
- Hospitals should carry out regular audit of compliance with guidelines.
- Hospitals should consider the implementation of new technologies like, point of care testing using thromboelastography to help guide the appropriate use of platelet transfusions in cardiac, liver and vascular surgery etc.
- Platelet crossmatching should be introduced for refractory cases.
- HLA matched and leucodepleted platelets for refractory cases.
- Whenever inventory allows ABO compatible platelets should be given.

REFERENCES

1. K. Saluja, B. Thakral, N. Marwaha, RR Sharma. Platelet audit, assessment and utilisation of this precious resource from a tertiary care hospital. Asian journal of Transfusion science 2007jan-june; 1(1): 8-11.
2. Hillyer Silberstein, Ness Anderson. Blood banking and transfusion medicine. Chapter 17, 2003Edition:181-187.
3. Seminars in Haematology: vol.48,no4,oct.2011,page 15.
4. Mozes B, Epstein M, Ben-Bassat I, Modan B, Halkin H. :Evaluation of appropriateness of blood and blood product transfusion using preset criteria. Transfusion: 1989 july-August.
5. Ratna Sharma, Mamta Manglani: Rationale use of blood components: an audit. Indian J. Haematol blood Transfusion 2009; 25(2): 66-69.
6. A. Thompson, M Contrereas, S Knowles. Blood component treatment: a retrospective audit in five major London Hospitals. J. Clin. Pathol 1991; 44:734-37.
7. Fatima Burca Belen, Arzu OKur, Ferit kulali, Odul Egritas etal. Platelet usage trends in a tertiary care hospital-could it be less and less expensive? Transfusion and Apharesis Science 2012; 47: 101-106.
8. McCulloggh J.Overview of platelet transfusion. Semin Haematol.2010 jul; 47(3): 235-42.
9. Heal JM, Blumberg N. Optimising platelet transfusion therapy. Blood Rev. 2004 Sep; 18(3): 149-65.
10. Slichter SJ. Algorithm for managing platelet refractory patients. J Clin Apher 1997; 12: 4-9.

Corresponding Author

Dr Aleem jan

Additional professor

Cl. Haematology

Room no 1212

SKIMS Soura Srinagar J&K India

190011

Cell:09419081211

Email:aleem_maleem@yahoo.co.in