



STUDY OF PLATELET AUDIT IN CPR HOSPITAL, KOLHAPUR, MAHARASHTRA, INDIA.

Pathology

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ABSTRACT

AIMS AND OBJECTIVES:

Platelet transfusion is an important treatment modality for prevention and treatment of bleeding. This study is aimed at assessing the preparation, utilization and discard of platelets in our hospital.

MATERIALS AND METHODS

We have done a retrospective study in Department of Blood Transfusion at CPR Hospital, Kolhapur, for a period of 4 months from 1st July to 31st October 2018. In this study appropriate utilisation, major users and expiry rates were analysed.

RESULTS

A total of 4119 whole blood units were collected, of which 3990 units were separated into components. Of these 1410 platelets were prepared; 444 platelet requisitions were received for 97 patients at our blood bank. Major users were CABG patients followed by patients of acute febrile illness (AFI), which together accounted for 33.4%. Expiry rate was found to be 57.5%

CONCLUSION

Regular audit of blood and blood components is must so necessary measures can be taken to increase appropriate and proper use of blood and blood components.

KEYWORDS

INTRODUCTION

Platelets are one of the most valuable and expensive product in transfusion medicine¹. Platelet transfusion is an important therapeutic modality. They play a key role in maintaining homeostasis. It can be lifesaving in certain circumstances and its demand is increasing. Transfusion audits reduce inappropriate transfusion in patients and identify areas of further development². We conducted a retrospective platelet audit to assess its preparation, appropriate utilization, and wastage at our institute.

MATERIALS AND METHODS

This is a retrospective study conducted in Department of Blood Transfusion at CPR Hospital, Kolhapur, over a period of 4 months from 1st July to 31st October 2018.

This study is aimed at describing the major users of platelets and expiry rate of platelets in our hospital.

Patient's data was collected from requisition forms with respect to age, gender, diagnosis, indication of transfusion, number of units issued, transfusion episodes, ABO an Rh (D) group or non-group specificity. An assessment was also made regarding expiry rate of platelet units.

Platelet concentrate from whole blood can be prepared by PRP method or buffy coat method and plateletpheresis using cell separator. Platelet issued in our hospital were RDP concentrate prepared by PRP method of fresh whole blood; light spin is given first at 1500 rpm for 18 min (350ml bags) or 1700 rpm for 15 min (450ml bags) and then after separation of PRP into satellite bags, a hard spin is given at 2500 rpm for 10 min. The supernatant is collected in plasma bag as FFP and platelets are resuspended in 50-70 ml of plasma.

RESULTS

Table 1: Total blood collection, No. of units separated, preparation of platelets and No. of platelets expired.

	July	August	September	October	Total
Total blood collection	1188	1005	985	941	4119

	1152	965	943	930	3990
Number of units separated into components					
Preparation of platelets	424	460	277	249	1410
No. of platelet units expired	80	260	157	115	812

During 4 month study period total 4119 blood collection were made; 3990 units were separated into components and 1410 platelets were prepared. Of these, 598 were utilized and 812 were discarded with expiry rate of 57.5%.

Table 2: Number of platelet units required according to age.

Age Group	No. of cases	No. of platelet units used	Percentage of platelet units used
0-15	12	21	4.72
16-30	35	147	33.10
31-45	18	99	22.20
46-60	18	93	20.94
61-75	14	84	18.91
Total	97	444	100

During this period 444 platelets were issued for 97 patients; of which 68 (70%) were males and 29 (30%) were females. Mean age of patients who received transfusion was 38 years ranging from neonate to 75 years.

Table 3: Indications for platelet transfusion'

Indication	No. of cases	No. of platelet units issued	Percentage of platelets used
CABG	13	79	17.7

Acute febrile illness	13	70	15.7
Sepsis	12	55	12.4
Dengue	11	41	9.2
Pancytopenia	9	41	9.2
PIH	10	39	8.8
Hemorrhage	7	31	6.9
ITP	6	19	4.3
DIC	1	4	0.9
Others*	15	65	14.6
Total	97	444	100

*Others included intestinal obstruction, mitral valve replacement, pneumonitis, CKD, etc.

The most common indication of the platelet transfusion in our study was CABG (Coronary Artery Bypass Grafting) followed by Acute Febrile illness which included patients of malaria, viral fever (except dengue; because of its high incidence dengue patients requiring platelets are categorised separately) together accounted for 33.4%. The indications are summarized in table no.³.

Table 4: Pattern of utilization of platelets in various specialities

Department	Platelet issued	Percentage of platelets issued
Medicine	160	36.0
CVTC	103	23.1
MICU	51	11.4
Trauma ICU	49	11.0
OBGY	38	8.5
Surgery	31	6.98
Paediatrics	12	2.7
Total	444	100

The pattern of platelet utilization according to various speciality is shown in Table no.4, in which medicine department accounted for 36.03% of platelets being utilized in our hospital.

DISCUSSION

During the last two decades all over the world, platelet utilization has increased more than the use of any other blood component. With development in blood bank practice, there is constant availability of the platelets.

Table 5: Comparison of major users of platelets in various studies.

Various studies	Year of study	Major user of platelets	Percentage of platelets issued
Present Study	2018	Medicine	36
S Poonam et al ¹	2014	Medicine	55.98
G Seema et al ⁴	2016	Medicine	48.38
M Smita et al ⁵	2016	Haematology	69
K Saluja et al ²	2007	Hemato-oncology	87.6

Medicine department caters to many patients of various illness in which platelets are reduced hence medicine department was the major user in our institute. In other studies hamato-oncology and medicine department were the major users for platelet concentrate. In our study most of the platelets were issued for patients of CABG (Coronary Artery Bypass Grafting) (17.7%). Since our institute has the well-established CVTC centre catering to many rural patients from the region of western Maharashtra, we found that CVTC centre was one of the major user. Second most common indication for platelet concentrate were patients suffering from acute febrile illness (15.7%) which included patients of malaria, viral infection except dengue fever (9.23%). Dengue was excluded from acute febrile illness as the incidence of dengue was quite high in the area perhaps because of poor hygiene.

Table 6: Comparison of group specific and group non-specific platelet transfusion in various studies

Various Studies	% of group specific platelet transfusion	% of group non-specific platelet transfusion
Present Study	99.4	0.6
M Smita et al ⁵	89.1	10.9
G Seema et al ⁴	69.5	30.44
K Saluja et al ²	95	5

ABO mismatch Platelet concentrate transfusion has been associated with poor platelet count increment in few studies. But this is usually clinically insignificant in term of haemostatic effectiveness of platelet transfusion. In our study only 3 (0.6%) out of 444 Platelet concentrate were transfused out-of-group especially when there was therapeutic indication and group specific Platelet concentrate were in short in our blood bank⁵.

Platelet concentrates have short shelf life because of their storage at room temperature and there is associated risk of bacterial growth at this temperature particularly beyond the shelf-life of 5 days.

Table 7: Comparison of platelet unit wastage in various studies

Various Studies	Year of Study	Wastage of platelet units
Present Study	2018	57%
K Saluja et al ²	2007	29.11%
M Rafat et al ⁶	2014	16%
G Seema et al ⁴	2016	7.1%
Q- Probe et al ⁷	2002	5.8-6.4%
M Smita et al ⁵	2016	1.99%

In present study expiry rate was 57% (812 units) out of 1410 units prepared. This is in sharp contrast to expiry rates of 5.8-6.4% quoted by Q-Probes study while evaluating 1,639 hospitals throughout United States. [15] This is because in our transfusion centre we prepare as well as issue blood components to various clinical specialities whereas in Q-Probes study, expiry rate was calculated from units which were received by hospitals from collection centres and were not utilized during the prescribed time interval. However, no data were shown on those units, which were prepared by the collection centres according to their demand and not distributed to transfusion centres during prescribed shelf-life. The mean ABO group non-specific platelet concentrate usage was low in our study. This was because of non-acceptance by physicians in transfusing platelets across the ABO barrier, which contributed to high expiry rate. The availability of bags permitting storage of platelets up to 3 days is also a major contributing factor for high expiry rate in our study.

CONCLUSION

Regular audit of blood and blood components is must so necessary measures can be taken to increase appropriate and proper use of blood and blood components.

REFERENCES

1. Jamal R, Hoe TS, Ong LC, et al. A clinical audit on the practice of platelet transfusions at a tertiary paediatric referral centre. *Malaysian J Pathol* 1998; 20(1):35-40.
2. Saluja K, Thakral B, Marwaha N, et al. Platelet Audit: Assessment and utilization of this precious resource from a tertiary care hospital. *Asian J Transfus Sci* 2007; 1(1): 8-11.
3. Poonam S, Bassi R, Bhardwaj S, et al. Audit of Random donor platelets utilization in a Tertiary care centre of North India. *JARMS* 2014; 6(3): 204-208.
4. Gupta S, Biyani S, Varshney L. Audit on platelet transfusion at MGM blood bank: a retrospective study. *J. Evolution Med. Dent. Sci.* 2016; 5(57):3956-3959.
5. Smita M, Gopal R, et al. Platelet audit: To weigh the rationality between requirement and uses in blood transfusion. *Int J Res Med Sci* 2016; 4(10): 4548-4551.
6. Far RM, Rad FS, Abdolazimi Z, Kohan MM. Determination of rate and causes of wastage of blood and blood products in Iranian hospitals. *Turk J Haematol.* 2014; 31(2):161-7.
7. David A, Novis MD, Richard C et al. Quality indicators of fresh frozen plasma platelet utilization. *Arch Pathol Lab Med* 2002; 126:527-532.