

Original Research Article

Audit of fresh frozen plasma usage, prospective study: a report from department of immunohematology and transfusion medicine, government medical college Jammu, Jammu and Kashmir, India

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Received: 05 February 2020

Revised: 07 February 2020

Accepted: 28 February 2020

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ABSTRACT

Background: Fresh frozen plasma is commonly used in tertiary care hospitals. These are used to manage conditions such as coagulation derangements. Unnecessary use of fresh frozen plasma (FFP) is known to increase the risk of side effects in plasma transfusing patients like anaphylaxis, transfusion related acute lung injury (TRALI) and risk of transfusion transmitted infections etc. So judicious use of plasma is extremely important where its benefits outweigh its potential risks.

Methods: Prospective observational study conducted over a period of six month. The following data were collected; provisional clinical diagnosis, indication of FFP'S, coagulation profile and gender of the patients. We evaluated all FFP transfusions, classified them as appropriate or inappropriate according to fresh frozen plasma transfusion guidelines of Directorate general of health services (DGHS).

Results: A total of 808 FFP units were issued (474 units to males and 334 units to females) over a period of 6 months. Out of these, 15% (122 units) of FFP's were issued to intensive care unit (ICU) patients, 12.87% (104 units) to paediatrics ward, 12.25% (99 units) to emergency ward which include patients with upper GI bleed and lower GI bleed, 6.8% (55 units) to obstetrics patients, 6.18% (50 units) to orthopaedics, 4.45% (36 units) to road traffic accident patients, 4.20% (34 units) to Hepatic failure patients, 3.09% (25 units) to Cardiothoracic and vascular surgery (CTVS), 2.97% (24 units) to oncology patients, 2.47% (20 units) to snake bite patients, 1.23% (10 units) to dengue patients, 1.11% (9 units) to Haemophilia patients, 27.38% units were issued to the patients where indication for FFP transfusion was not known.

Conclusions: study showed that 66.44% were appropriate and 33.56% were inappropriate use of FFP's in patients. This highlights the pitfalls in use of FFP among clinicians and for that matter there is need of awareness and understanding the transfusion medicine by clinicians.

Keywords: Audit, Coagulation profile, Fresh frozen plasma, Potential risks

INTRODUCTION

Human donor plasma prepared and frozen within 6 to 8 hours of collection is fresh frozen plasma. Fresh frozen plasma has been available since 1941 and was initially

often used as volume replacement. Fresh frozen plasma (FFP) is component that is prepared from whole blood.¹ FFP contains factor VIII, IX, von willebrand factor, and other clotting factors along with plasma proteins. FFP is now used in cases of massive bleeding or to prevent

bleeding in patients with abnormal coagulation profile undergoing an invasive procedure.² Inappropriate requests for plasma transfusions, exposes patients to risks of transfusion, reduce the availability of FFP which can be allocated to the production of plasma derivatives, still remains insufficient to cover national needs.³⁻⁵ Plasma transfusion is not without risks, unnecessary use of FFP is known to increase the risk of side effects in plasma transfusing patients like anaphylaxis, transfusion-related acute lung injury (TRALI) and risk of transfusion-transmitted infections etc. Despite various available national and international guidelines for FFP transfusion, sometimes FFP transfusion is given inappropriately.⁶ So judicious use of plasma is extremely important where its benefits must outweigh its potential risks.

Author aimed to evaluate utilization of fresh frozen plasma in tertiary care center.

METHODS

This was a prospective and observational type of study, conducted over a period of 6 month from July 2018 to December 2018 at department of Immunohematology and transfusion medicine, Govt Medical College Jammu and Shri Maharaja Gulaab Singh hospital (SMGS), Jammu and Kashmir, India, to evaluate the appropriate use of FFP usage. The following data were collected; provisional clinical diagnosis, indication of FFP’s, coagulation profile (PT, PTI, INR) and gender of the patients. We evaluated all FFP transfusions classified them as appropriate or inappropriate according to the FFP transfusion guidelines of Directorate General of Health Services (DGHS). Transfusion of 10-12ml/kg body weight of FFP’s with INR >1.5 in patients and in whom clinical criteria for FFP usage were fulfilled were classified as appropriate, otherwise in appropriate. SPSS software was used for statistical analysis. Data was put into tabulated form; pie charts and histograms were used wherever required.

Inclusion criteria

- All age groups were included irrespective of gender.
- Patients with coagulation screening done like PT, PTT and INR values before transfusion of FFP’s.

Exclusion criteria

- FFP’S issued during emergencies.
- Request forms of patients without coagulation screening done.

RESULTS

A total of 808 FFP units were transfused in 202 patients with different clinical indications of which 117 patients were males and 85 patients were females, over a period of 6 months which include 474 units (58.6%) to males and 334 units (41.4%) to females (Figure 1). Out of these,

15% (122 units) of FFP’s were issued to intensive care unit (ICU) patients, 12.87% (104 units) to paediatrics ward, 12.25% (99 units) to emergency ward which include patients with upper GI bleed and lower GI bleed, 6.8% (55 units) to obstetrics patients, 6.18% (50 units) to orthopaedics, 4.45% (36 units) to road traffic accident patients, 4.20% (34 units) to Hepatic failure patients (HFP), 3.09% (25 units) to Cardiothoracic and vascular surgery (CTVS), 2.97% (24 units) to oncology patients, 2.47% (20 units) to snake bite patients, 1.23% (10 units) to dengue patients, 1.11% (9 units) to Haemophilia patients (Figure 2), 27.38% units were issued to the patients where indication for FFP transfusion was not known.

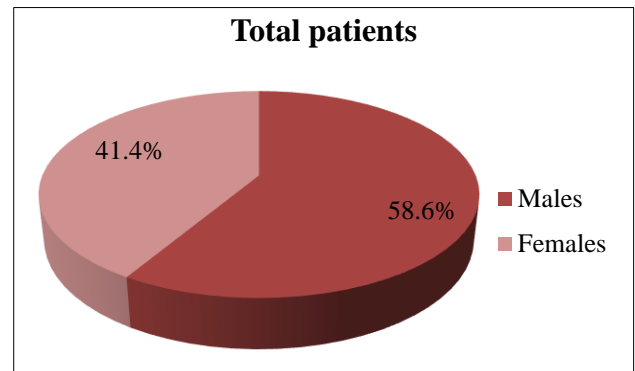


Figure 1: Percentage of FFP’s issued to males (58.6%) and females (41.4%).

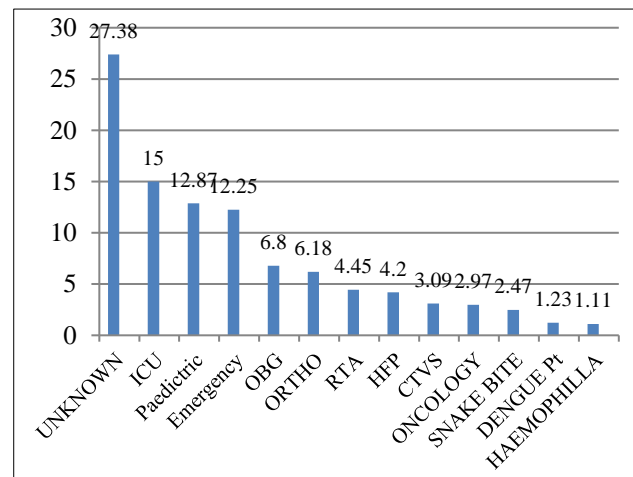


Figure 2: Histopathology picture of neurocysticercosis.

In 33.56 % (27.38% + 6.18% of orthopaedics ward) issued cases of FFP’s INR was <1.5 and is considered inappropriate use of FFP. In rest 66.44% issued cases INR was >1.5 and is considered as appropriate use of fresh frozen plasma. Orthopaedics department shows maximum number (6.18%) of inappropriate FFP usage in our setup followed by ICU patients where 5% FFP usage were inappropriate. Least number of inappropriate FFP usage (0.99%) were seen in oncology patients. Table 1

shows the department wise appropriate and inappropriate usage of FFP's.

Table 1: FFP usage in various departments.

Various departments	% of FFP usage	Appropriate usage (INR>1.5)	Inappropriate usage (INR<1.5)
Unknown	27.38%	18.28%	9.1%
ICU	15%	10%	5%
Paediatric	12.87%	8.57%	4.3%
Emergency	12.25%	8.15%	4.1%
Obstetrics and gynaecology	6.8%	4.6%	2.2%
Orthopaedics	6.18%	-	6.18%
Road traffic accident patients	4.45%	4.45%	-
HFP	4.2%	3.54%	0.66%
CTVS	3.09%	2.06%	1.03%
Oncology	2.97%	1.98%	0.99%
Snake bite cases	2.47%	2.47%	-
Dengue patients	1.23%	1.23%	-
Haemophilia	1.11%	1.11%	-

DISCUSSION

Blood and its component should be used cautiously and appropriately. Each requisition for FFP transfusion should have clinical indication favouring it. Unnecessary use of FFP can have a serious impact on patient's safety as its transfusion may lead to allergic reactions, transmission of transfusion transmissible infections, TRALI, volume overload, etc. So, audit of the FFP usage is considered a near perfect method for improving the use of this blood component. Plasma therapy should be rationalized as many important products of fractionation such as albumin, globulin, and factor VIII and IX are prepared from plasma. The result of this prospective study showed that 66.44% were appropriate and 33.56% were inappropriate use of FFP transfusion in patients (Figure 3).

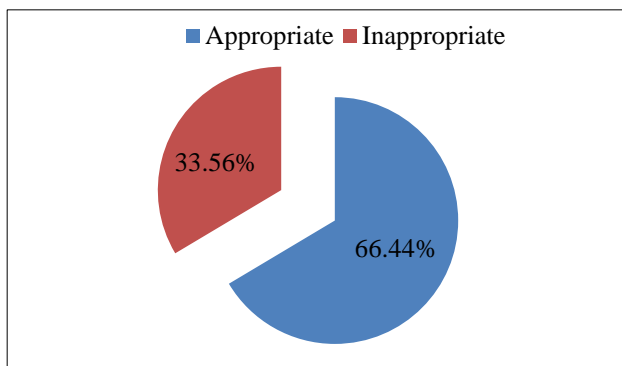


Figure 3: Percentage of FFP usage.

Variable results were seen from other studies, from 73% inappropriate (Chng et al), to 23.10% (Kakkar et al).^{7,8}

Basu et al, found 42% FFP were inappropriate issued.⁹ Chatterjee et al, found 61% appropriate FFP among surgical oncology patients.¹⁰ Eagleton et al, study showed 66% appropriate FFP usage.¹¹ Luk et al, study showed 47% appropriate FFP usage.¹² studies showing inappropriate use of FFP's (Table 2).

Table 2: Inappropriate use of FFP in various studies.

Studies	Inappropriate use of FFP (%)
Chng et al	73%
Luk et al	53%
Basu et al	42%
Chatterjee et al	39%
Eagleton et al	34%
Kakkar et al	23.10%
Present study	33.56%

For better inventory management, audit of FFP usage is important to monitor clinical transfusion practices. Maximum number of units were transfused to the intensive care unit patients, then to the paediatric ward and emergency ward. In emergency ward the maximum number were transfused to upper GI bleed patients and lower GI bleed patients.

CONCLUSION

Fresh frozen Plasma transfusion plays important role where you do not have fractionation products of plasma, so judicious use of FFP is important keeping in mind the potential risks of FFP's as well. This study showing the 33.56% inappropriate use of FFP highlights the pitfalls in use of FFP by our clinicians and for that matter there is need

of awareness and understanding the transfusion medicine by clinicians. Evaluating the inappropriate use of FFP's, we can fairly access to the National plasma policy. This policy makes easily accessible and adequate supply of high quality of human plasma derived proteins for clinical/therapeutic use. And a step forward to decrease the gap of demand-supply of plasma-derived medicinal products (PDMPs). At present, all the recovered plasma is not being used for plasma fractionation, so by knowing the inappropriate usage of FFP's we can use the same through National plasma policy for the betterment of patients and at an affordable price.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Shah SN, Sidhu M, Gupta V. Audit of fresh frozen plasma usage, prospective study: a report from department of immunohematology and transfusion medicine, government medical college Jammu, Jammu and Kashmir, India. *Int J Res Med Sci* 2020;8:1371-4.