A STUDY ON EVALUATION OF APPROPRIATE USAGE OF FRESH FROZEN PLASMA (FFP)

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ABSTRACT:

The term FFP refers to the fluid portion of 1 unit of human blood that has been centrifuged, separated & frozen solid at -18°C or colder within 8hrs of collection. The indications for transfusing FFP are very limited, as it can cause unpredictable adverse reactions. A retrospective study of FFP transfusion was carried out at the blood bank-Gandhi Medical College for a period of 6 months; i.e January 2011–July 2011 for various indications. We evaluated 840 patients who received 1534 units of FFP and classified them as appropriate, clinically appropriate and inappropriate. In our study appropriate and clinically appropriate transfusions of FFP were about 61%- a good proportion of FFP transfusions were justified but 39% were of without any appropriate indication.

KEY WORDS: Fresh Frozen Plasma, Centrifugation, Adverse Reactions

INTRODUCTION:

The use of FFP has increased due to multiple factors, possibly increased acceptance of the concept of component therapy.FFP contains the labile as well as stable components of the coagulation , fibrinolytic & complement system; the proteins(that maintain oncotic pressure & modulate immunity) and fats, carbohydrates & minerals are present in concentrations similar to those in circulation. The most labile coagulation factors are preserved for 1 yr if FFP is kept at -30° C or below. The FFP should be administered as soon as possible after thawing & in any event within 12 hrs if kept at 2-6°C.

Contents of 1 unit of FFP prepared from 450ml of whole blood
Plasma : 175-230ml
All Coagulation Factors : 1 i.u/ml of each factor including factors V & VIII)
Fibrinogen : 200-400 mgm

INDICATIONS OF FFP:

- Active bleeding,
- Liver diseases
- Disseminated intravascular coagulation (DIC)
- Thrombotic Thrombocytopenic Purpura (TTP)
- Coagulopathy in massive transfusion
- Familial Factor V deficiency
- Deficiency of Factors II, VII, IX, X
- Antithrombin III deficiency
- Congenital or Acquired coagulation factor deficiency[1]

DOSAGE OF FFP:

About 10ml/Kg body wt. Post transfusion assessment of levels of APTT, PT & fibrinogen is done for monitoring the effect of FFP[2]. Plasma should be ABO compatible with the recipient blood.

AIMS & OBJECTIVES:

Evaluation of appropriate usage of FFP in a period of 6 months (January 2011- June 2011) in Gandhi Hospital.

MATERIALS & METHOD:

A Retrospective study was conducted at Gandhi Hospital Blood bank for a period of 6months (January 2011-june 2011). We evaluated 840 patients, who received 1534 units of FFP & classified them as 1.Appropriate; 2.Inappropriate; 3. Clinically appropriate.

Table: 1- SEX RATIO (M: F ratio- 1:1.5)

SEX	MALE	FEMALE	TOTAL
No. of patients	382	458	840
%	45.5%	54.5%	100%

Table: 2- AGE GROUP

AGE GROUP	JAN	FEB	MARCH	APRIL	MAY	JUNE	TOTAL	JAN
0-20	33	35	36	34	28	56	222	26.7%
21-40	71	44	49	68	74	91	397	21-40
41-60& ABOVE	31	39	30	25	24	62	211	31

Table: 3- Guidelines-British Committee for Standard Hematology[3]

SNO	CLINICAL CONDITIONS	TOTAL REQUIREMENT	APPROPRIATE	CLINICALY APPROPRIATE	INAPPROPRIATE	%
1.	Liver Diseases	152	----	152	----	18%
2.	DIC	84	----	84	----	10%
3.	Hemophilia	168	168	----	----	20%
4.	Sepsis + Burns	168	60	----	108	20%
5.	Cardiac surgeries	168	----	----	168	20%
6.	Snakebite	80	50	----	30	9.5%
7.	Others	20	----	----	----	2.5%
8.	Total	840	278	236	306	

Table: 4- Total patients-840 ; Total units-1534

BLOOD GROUP	O+ve	B+ve	AB+ve	A+ve	O-ve	A-ve	B-ve	AB-ve
No. of Patients	338	227	48	168	13	6	20	2
Percentage	40.9 %	27.3 %	5.9%	20%	1.7%	0.9%	2.8%	0.5%

RESULTS:

- Total patients who received FFP are 840, out of which males were 382 and females we 558 (table:1)
- Age group ranging from 0-20 years constitute 26.4%; 21-40 years 47.2%; 41-60 years 26.2% (table:2)
- Depending upon the conditions patients received FFP have been divided into 8 groups according to the guidelines provided by British Committee for Standard Hematology[3] (table:3)
- Out of 840 patients, conditions like liver diseases, disseminated intravascular coagulation are clinically appropriate (where there is active bleeding leading to coagulopathy) and hemophilia, sepsis, burns, rheumatic heart diseases, snake bite and shock are considered to be appropriate (the term appropriate is limited to the treatment of coagulation protein deficiency, for which specific factor concentrates are un available or undesirable)-(table:3)
- No.of units of FFP transfused are 1534 in six months period. Of this 40.9% are transfused to O positive blood group (table: 4).

DISCUSSION:

- FFP is efficacious for treatment of Deficiencies of factors II, V, VII, IX, X & XI.
- Reversal of warfarin effects: Patients who are anticoagulated with warfarin are deficient in functional vitamin K dependent coagulation factors II, VII, IX, X as well as protein C & S. FFP can be used to achieve immediate hemostasis.

- Massive Blood Transfusion: In patients with documented blood clotting abnormalities, prolonged APTT, INR after huge blood loss requiring 4 or more units of packed red cells-FFP is commonly recommended.
- FFP can be used as a source of Antithrombin III in patients who are deficient of this inhibitor & undergoing surgery or who require heparin for the treatment of thrombosis.
- FFP useful in infants with secondary immunodeficiency associated with severe protein losing enteropathy, FFP can be used as a source of immunoglobulin for children & adults with human immunodeficiency.
- FFP is used in treatment of Thrombotic thrombocytopenic purpura.

ASSOSIATED RISKS:

- Anaphylactoid reactions
- Alloimmunisation
- Transfusion related acute lung injury (TRALI): antibodies against the patients granulocytes may cause leucocyte aggregation in pulmonary vessels leading to TRALI[4]
- Increase in infections
- Excess usage-Hypervolemia & cardiac failure (The guidelines set by British Committee for Standard Hematology was followed in our study). [3]

Approximately 60% FFP used are inappropriate according to Kakkar et al [5], but clinically apparent cases like liver diseases, coronary bypass surgeries reduced the inappropriate usage to 28%. Severe liver disease[6, 7, 8] is one of the most common clinical indications for transfusion of FFP. Patients with liver diseases have several abnormalities that can lead to bleeding like coagulopathy, Disseminated Intravascular Coagulation (DIC), Thrombosis. According to Consten et al[9] & LA Harker et al[10] in cardiac surgery [11] post operative bleeding due to residual effects of heparin may be corrected with transfusion of FFP.

CONCLUSION:

In our study appropriate & clinically appropriate transfusions of FFP were about 61%. It is desirable that educational programmes be arranged for doctors regarding appropriate usage of FFP.

Blood bank associations & Hematologists should more firmly adhere to the guidelines.

In our institution 61%, a good proportion of FFP transfusions were justified and 39% were used without any appropriate indications.

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