A Study of usage of Fresh Frozen Plasma and effect of Fresh Frozen Plasma on Pre-Transfusion International Normalised Ratio (INR)

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Background:
- The use of Fresh Frozen Plasma has significantly increased in the past 10 years. Despite improvement in quality control, standardisation and available guidelines about use of FFP, there is a high frequency of inappropriate use of this blood component.
- The indications for use of FFP are single coagulation factor deficiencies, multiple coagulation factor deficiencies, disseminated intravascular coagulation (DIC) and severe diseases like liver cirrhosis.
- The National Health and Medical Research Council (NHMRC) and Australian Society of Blood Transfusion guidelines (2013) have published the guidelines for appropriate use of FFP.

Aims:
- To study the effect of Fresh Frozen Plasma on Pre-Transfusion INR.

Method:
Plasma separated from whole blood and frozen at -30 degree Celsius or lower within 2-6 hours of collection is termed as Fresh Frozen Plasma. Procedure is done at 3500 rate per minute for 10 minutes at 4 degree Celsius using Heraeus cryofuge 6000P centrifuge. Thereafter, two-thirds of plasma is expressed into satellite bag depending upon the blood bag type. Then Plasma Bag is separated from RCC/RCA and unit number, date of collection, date of expiry are mentioned on plasma bag and frozen at -30 degrees Celsius or lower.

Results:
- Total 2048 units of FFP were transfused to 500 patients & study done.
- The usage of FFP was categorised as appropriate if it was transfused in adequate dosage (10-15ml/kg body weight) for indication as per NHMRC and ASBT guidelines. According to that 415 (83 percent) patients were transfused appropriately and 85 (17 percent) patients were transfusion inappropriately. (fig 1)
- Pre and Post Transfusion INR were compared in a total of 415 patients. Mean improvement in Pre-transfusion INR per unit of FFP was 0.26 (median-0.25, range 0.02 to 1.2, SD- 0.16). Linear relationship was noted between Pre-transfusion INR and improvement in INR per unit of FFP. Pearson's correlation coefficient (r) was 0.92, showing that net improvement in INR was more with higher Pre-Transfusion INR. (fig 2)
- Using the formula derived by Holland and Brooks, a change in 8.9 percent or more in the pre-transfusion INR per unit of FFP was considered as a significantly change. Out of 415 patients, 252 patients (60.7 percent) showed a significant improvement in Pre-Transfusion INR and 163 patients (39.3 percent) showed no significant benefit. Most of the patients with a higher Pre-Transfusion INR showed a significant change in INR.

Conclusion:
- Patients with a high Pre-Transfusion INR are more likely to be benefitted with FFP and show more improvement in INR per unit of FFP.
- There is a need for awareness of FFP usage to prevent wastage of FFP that avoids shortage and minimizes the cost.

References: