

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. In spite of 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 rpm 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 transfused 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 significant 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 signing benefit. Most of the patients with a higher Pre-Transfusion INR showed a significant change in INR.

Fig 1: Patient Distribution (appropriate & inappropriate with significant / insignificant improvement)

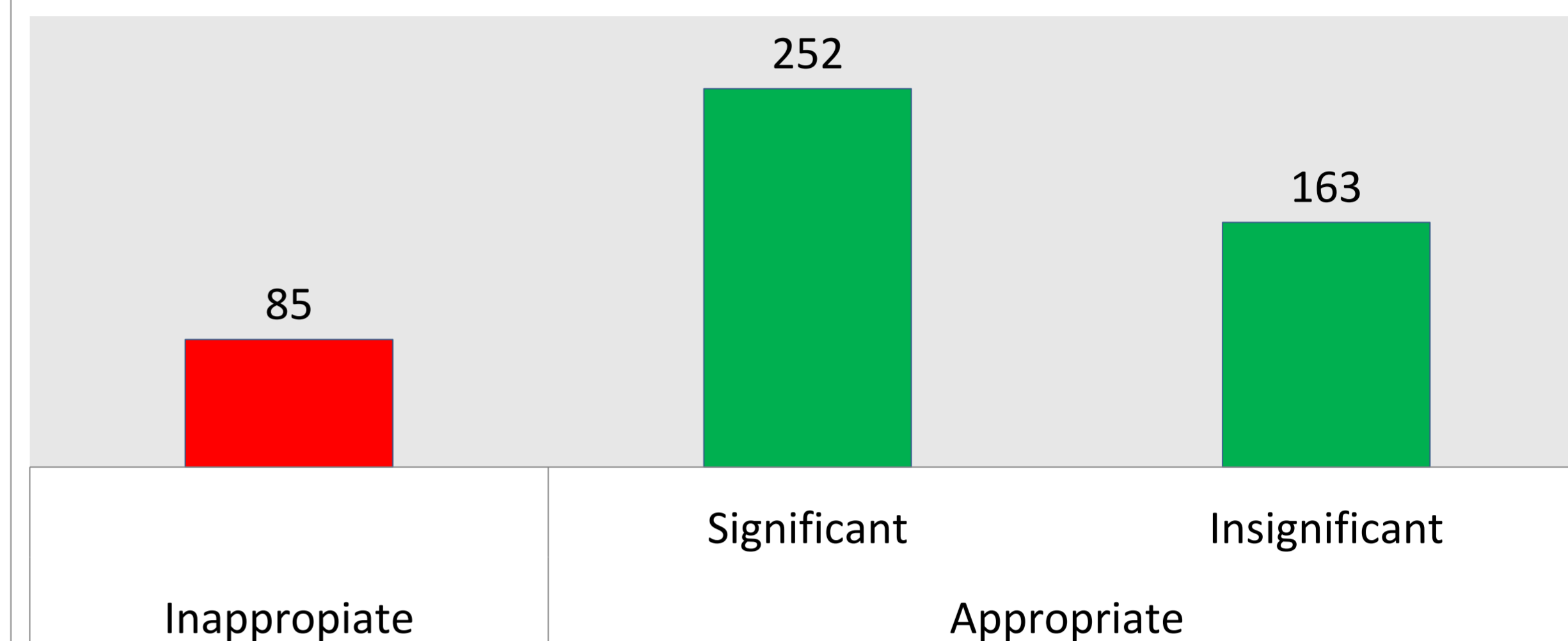
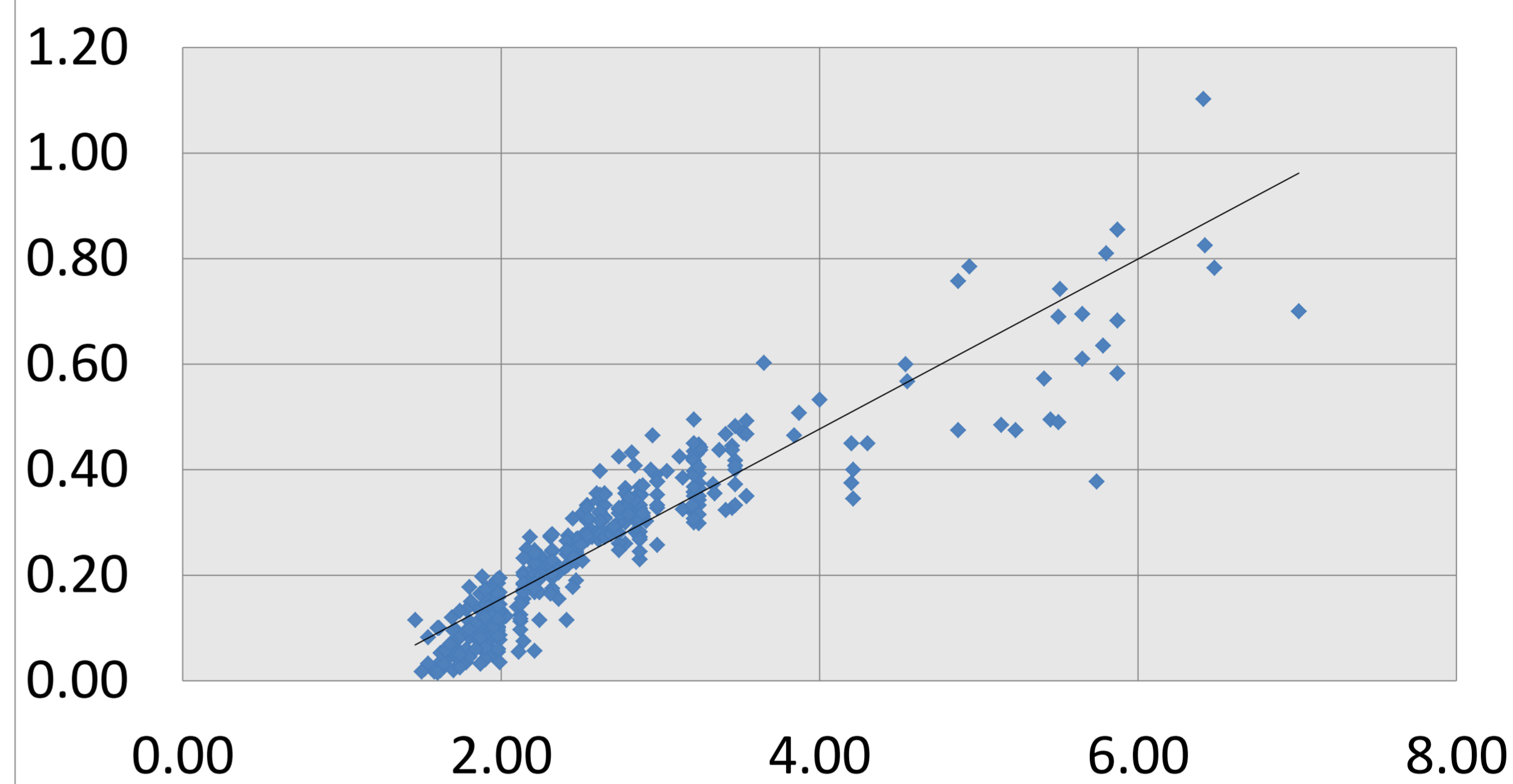


Fig 2: Linear relationship between Pre-transfusion INR and improvement in INR per unit of FFP



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:

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