Coagulation Conundrum!

A audit of current transfusion practice against national standards in a tertiary NICU.
An opportunity to improve.

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Background

- There is a wide variation in practice for use of FFP and cryoprecipitate in neonates of different gestations.
- Testing coagulation without clear clinical indication involves a cost to both the patient and hospital.

Literature review

- 13 relevant studies- **paucity of robust data available.**
- Catford et al demonstrated that routine measurement of coagulation resulted in 5 fold increase in FFP use without clinical benefit.[2]
- In a prospective study from Christensen et al (2014), reference ranges were obtained using cord blood samples from 175 neonates under 34 weeks gestation. The 95 % confidence interval was calculated at various gestational age groups at birth, including under 28 weeks.[4]
- In a cross sectional study by Neary et al, [7] cord and peripheral blood of neonates <30 weeks gestation was drawn at birth and at days 1, 3 and every 2 weeks until 30 weeks corrected gestational age for coagulation testing (PT, APTT and fibrinogen). Control blood was obtained from term infants. 116 infants were recruited with a median gestational age of 27.7 weeks gestation, resulting in new reference ranges.

Aim

I reviewed the use of FFP/ cryoprecipitate in a tertiary NICU against the audit standards published by the National Comparative Audit of Blood Transfusions (NCABT).
The study period was 1/1/22 to 1/6/22.

- KP1: Trusts have a local policy/guideline for transfusion of FFP/ cryoprecipitate to neonates
- KP2:Trusts do not have a policy of routinely checking coagulation screens on all preterm neonates
- KP3: Coagulation tests are performed before giving prophylactic FFP/ cryoprecipitate.
- KP4: Reason for the use of FFP/ cryoprecipitate is documented in the patient notes.

Protocol/ Methods

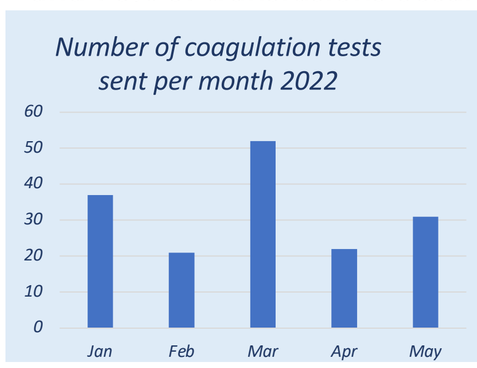
The NCABT audit standards (2021) provided an overview of national practice with key areas for improvement. This study reviewed current practice against the standardised audit tool.

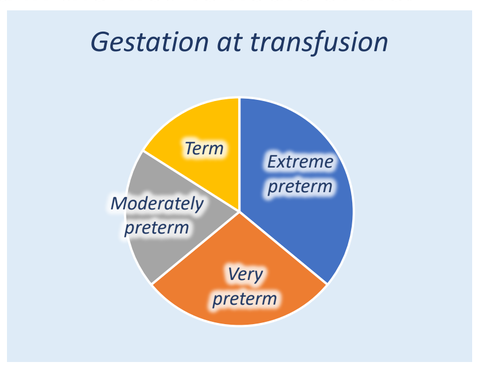
Data was obtained from the haematology laboratory and blood bank, on the coagulation screens sent and FFP/ cryoprecipitate issued and transfused.

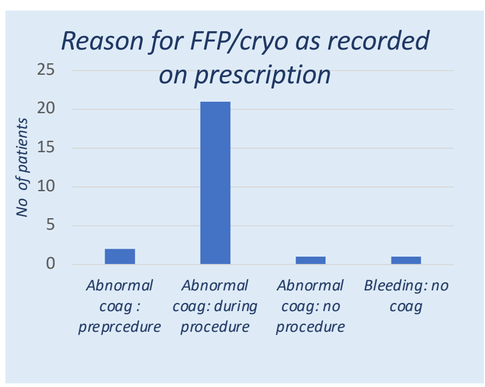
Information on patient demographics, documentation, prescription, coagulation testing and consent was obtained from review of clinical notes, Badgernet and Electronic Care Record.

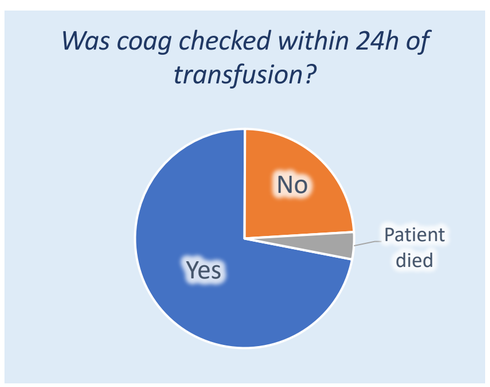
Results

- In the study period, 163 coagulation screens were sent. 39 blood products (32 FFP/ 7 cryoprecipitate) were issued and transfused to 25 patients. 64% were given to neonates <32 weeks' gestation, and 76% of transfusions occurred in the first 48 hours of life.

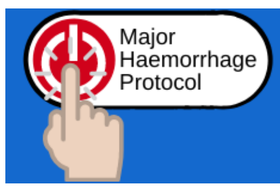








Reason for transfusion was documented in 84%
Volume transfused was correct in 87.5%
12.5% underdosed requiring repeat transfusion within 24 hours

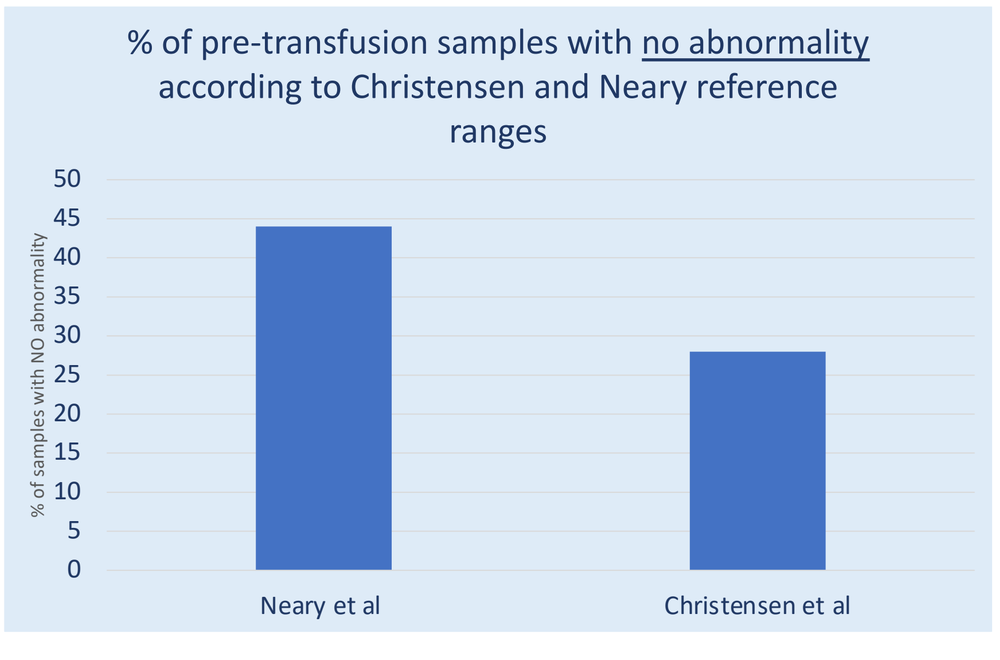


No protocol in our unit

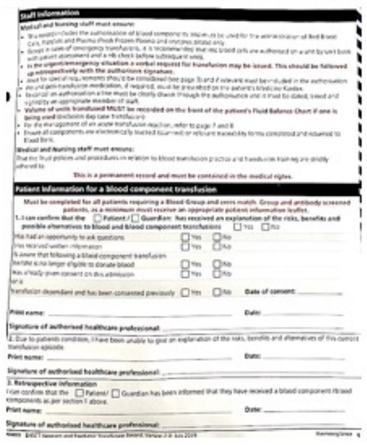
- Interestingly, on review of the coagulation screens used to determine need for transfusion against local guidelines, **no abnormality of coagulation was detected in 44% of samples.**

Reference ranges from Neary et al [7] were in our local guideline at the time of the study **but** not widely used. Most clinicians preferred the Christensen et al [4] (more conservative reference ranges).

Following discussion, our guideline was updated with the Christensen et al reference ranges.



Consent for transfusion



64% No written consent
24% Partial written consent
12% full written consent

Conclusions

- ✓ The variation in practice for testing coagulation, reference ranges and use of blood products is a key area for improvement for all neonatal units, reflected in national audit data and this follow up study.
- ✓ Local education, guideline review and consultation with laboratory staff is underway to improve our practice.
- ✓ Our unit has reverted to the more conservative reference ranges for coagulation on basis of this study. (Christensen et al data[4])

References

1/Pal S, Curley A, Stanworth SJ. Interpretation of clotting tests in the neonate. Arch Dis Child Fetal Neonatal Ed 2015;100:F270–F274.
2/Catford K, Muthukumar P, Reddy C, et al. Routine neonatal coagulation testing increases use of fresh-frozen plasma. Transfusion 2014;54:1444–5.
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7/ Neary E el al. Laboratory coagulation parameters in extremely premature infants born earlier than 27 gestational weeks upon admission to a neonatal intensive care unit. Neonatology 2013;104(3):222-7