September 22nd, 2023 09:00 - 11:00

# PARALLEL SESSION 24 – Neonatal Blood Transfusion

## ID 545. REFERENCE VALUES OF THROMBOLASTOMETRY PARAMETERS IN HEALTHY TERM NEONATES

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Background : Rotational Thromboelastometry (ROTEM ) as a point of care test is an attractive tool for rapid global evaluation of hemostasis. In adults and guide for transfusion therapy. According to the concept of developmental hemostasis , the levels of most of the coagulation factors are lower in the newborn and they are related to gestational and postnatal age. Conventional tests of coagulation such as prothrombin time (PT)–partial thromboplastin time(PTT ) are of limited utility in predicting hemorrhage and guiding transfusion therapy in critically ill neonates. Currently, no reference ranges exist for all ROTEM assays in neonates, limiting its use in this vulnerable population.

The establishment of reference ranges for standard extrinsically activated (EXTEM), intrinsically activated (INTEM) and fibrinogen polymerization (FIBTEM) ROTEM assays, in whole blood samples in a relatively large sample of healthy term neonates and to determine the impact of gender, delivery mode, hematocrit on ROTEM parameters.

Methods: This single centre observational study included 226 full term neonates with appropriate birth weight for gestational age ,born in the General Hospital of Nikaia, "AghiosPanteleimon", Piraeus, over a 3 year period (2017–2020). EXTEM, INTEM and FIBTEM assays were performed on the 2nd–3rd day of life simultaneously with any occasion for blood testing for various medical conditions.

Results: Reference ranges (2.5th and 97.5th percentiles) were obtained for clotting time (CT), clot formation time (CFT), α–angle, clot firmness at 10 min (A10), maximum clot firmness (MCF), and lysis index at 60 min (LI60, %). Reference ranges for EXTEM were CT 38–78 s, CFT 49–148 s, A10 40–65 mm, and MCF 47–69 mm, LI60 83–98%. For INTEM, CT 134–270 s, CFT 50–142 s, A10 41–63 mm, and MCF 48–67 mm, LI60 85–97%, and finally, for FIBTEM: CT 36–85 s, A10 9–25 mm and MCF 10–26 mm, LI60 92–100%. Hematocrit values were positively correlated with CT, CFT and negatively with A10, MCF values.

Conclusion: This study provides, for the first time, reference ranges for ROTEM EXTEM/INTEM/FIBTEM values simultaneously in healthy term neonates. The combined evaluation of ROTEM tests increases its diagnostic accuracy, contributing to the expansion of ROTEM use in the neonatal population.

None declared

# ID 149. Comparing Inflammation Proteins before and after Platelet Transfusion in NICU

**Doctor Carmel Maria Moore**[1,2], Doctor Daniel O'Reilly[2,3], Prof Naomi McCallion[3,4], Doctor Anna Curley[1,2]

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Background: Studies have demonstrated increased morbidity and mortality with platelet transfusions in the neonatal period and at two years corrected. Platelets are as important for host immunity and inflammation as for haemostasis. Increased inflammation may explain the dose–associated increase in mortality, bleeding, and lung disease noted after platelet transfusions in the NICU population. Murine neonatal models have demonstrated an increase in inflammation levels after platelet transfusions. This study aims to assess if the there are any changes in inflammatory cytokines post–platelet transfusion in babies in NICU.

Methods: This prospective observational study recruited babies due to receive a non–emergency platelet transfusion. Samples were collected prior to and two hours post–platlet transfusion. Samples were processed using multiplex immunoassay to enable analysis of tiny blood volumes in dried bloodspot samples. Statistical analysis was performed using R. Results corrected for multiple pairwise comparisons.

Results: 17 babies underwent 26 platelet transfusions across two centres. Median birthweight was 1545g (535–3960g) and median birth gestation was 31 weeks and one day (23+1 — 40+5). Median pre–transfusion platelet count was 19.5x109/l.

There was a significant increase in levels of CXCL5 (p<0.001), CD40 (p=0.001), TGF–β (p=0.001) in neonatal blood samples post–platelet transfusion in the study group.

Conclusion: The increase in the pro–inflammatory cytokines CXCL5, CD40 and TGF–β noted in this study after platelet transfusion in babies in NICU could potentiate existing inflammation, NEC, lung, or white matter injury. This is the first time that this has been demonstrated in human neonates. This could potentially explain long–term harm from platelet transfusion in babies.

None declared

# ID 1052. Diagnostic utility of full blood count screening in neonates born to mothers with moderate -severe thrombocytopenia

**Miss Ligia Nechifor**[1], Doctor Daniel O'Reilly[1], Mr. John O'Loughlin[2], Ms. Fionnuala Ni Ainle[3], Professor Naomi McCallion[1], Doctor Lyudmyla Zakharchenko[1]
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Background: Maternal thrombocytopenia during pregnancy is relatively common. However, the relationship between maternal and neonatal thrombocytopenia is poorly understood.
We aimed to determine whether a correlation exists between platelet counts of neonates born to thrombocytopenic mothers (<100 X 10^9/L) and maternal counts, given the non–evidence based practice of screening these neonates with an early full blood count (FBC).

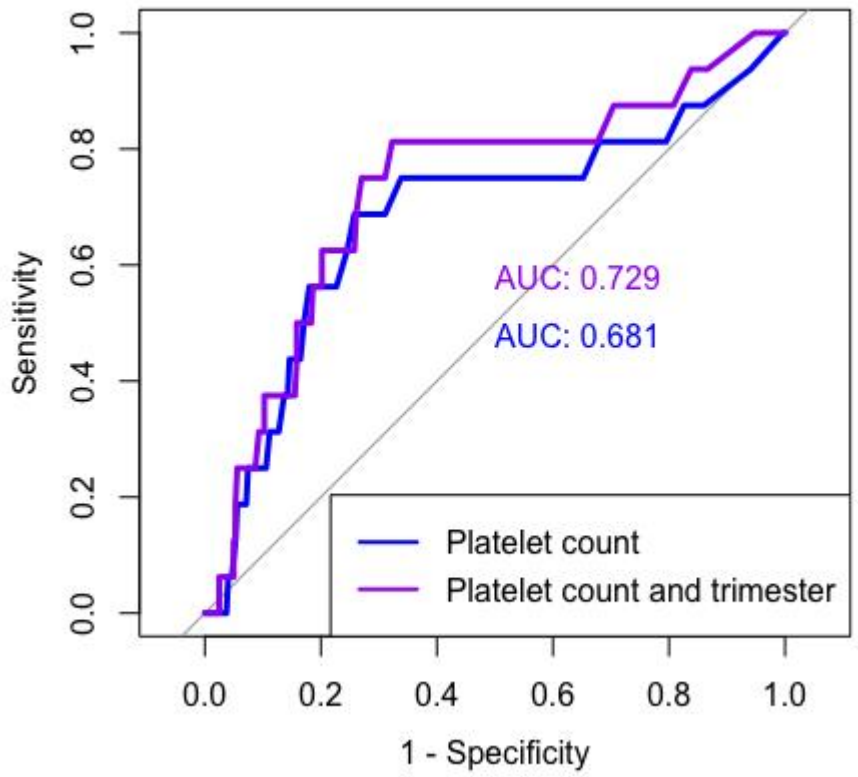
Methods: We identified records from 557 thrombocytopenic mothers and the 337 associated newborn charts from 2018 to 2022.
Mothers with a maternal platelet count <100 X 10^9/L prior to delivery during present gestation were included. Any thrombocytopenia that occurred outside of pregnancy or in the post–partum period was excluded.
Receiver operator characteristic (ROC) curves were generated using the 'pROC' statistical package on R and Area under the Curve (AUC) examined. Coordinates of the "best" fit model were examined using the 'pROC' statistical package.

Results: A total of 550 FBCs were taken in neonates of mothers with thrombocytopenia. 16 neonates with clinically significant thrombocytopenia (Platelet

count <100X10^9/L) were identified. “Number(s) needed to treat” (NNT) was 78 FBCs for infants requiring treatment and 183 FBCs to identify a clinically significant hemorrhage.

Maternal platelet count alone was not a significant predictor of neonatal thrombocytopenia (figure 1). The addition of trimester of onset of thrombocytopenia did not significantly improve predictive power. The coordinates of the best platelet count threshold for this dataset were then derived from the ROC curve and determined that a threshold of 78 x10^9/L maternal platelets offered the best sensitivity (74%) and specificity (68%) in this cohort.

Conclusion:
Screening FBCs based on maternal platelet counts <100X10^9/L has a poor diagnostic yield and accuracy.




ROC curve with AUC for maternal platelet count alone (as continuous variable) versus < 80 x10^9/L (as dichotomous variable) in identifying neonatal thrombocytopenia

ROC curve with AUC for maternal platelet count alone (as continuous variable) versus < 80 x10^9/L (as dichotomous variable) in identifying neonatal thrombocytopenia

None declared

# ID 83. ASSESSMENT OF HEMOSTATIC PROFILE OF INTRAUTERINE GROWTH RESTRICTED NEONATES USING NATEM ASSAY IN CORD BLOOD SAMPLES

**Doctor Eleni Karapati**[1], Doctor Zoi Iliodromiti[1], Doctor Abraham Pouliakis[2], Doctor Rozeta Sokou[1], Doctor Marina Tsaousi[1], Doctor Alma Sulaj[1], Professor Nicoletta Iacovidou[1], Doctor Serena Valsami[3], Doctor Theodora Boutsikou[1]

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Background: Intrauterine growth restriction(IUGR) carries severe morbidity during the perinatal period. Although disturbances of the hemostatic system are commonly observed in this population, they are not usually correlated with clinical manifestations. Rotational thromboelastometry(ROTEM) provides a rapid and detailed evaluation of the hemostatic system, though data for neonates are scarce. We aimed at examining the hemostatic profile of IUGR neonates using the non-activated assay(NATEM) in cord blood(CB) samples.

Methods: During a time-period of 18 months NATEM assay was performed in CB samples of 101 IUGR, 19 preterm (gestational age(GA)<37wks) and 82 term neonates(GA>37weeks), according to manufacturer's guidelines. Additionally, full blood count of the CB was done. 189 appropriate for gestational age(AGA) neonates served as controls. Demographic, clinical and laboratory data were documented.

NATEM variables documented are: clotting time(CT–seconds), formation time(CFT–seconds), clot amplitude at 5, 10 and 20 min (A5, A10, A20); α–angle(a°), maximum clot firmness(MCF–mm), lysis index at 30 and 60 min (LI30, LI60–%), and maximum clot elasticity(MCE)

Results: IUGR neonates demonstrate a hypocoagulable state, with lower A5, A10, A20, MCF and MCE vs AGA. In multivariate analysis IUGR was established as an independent factor affecting all NATEM parameters (except CT and LI30), portraying a hypocoagulable and hypofibrinolytic profile, as indicated by lower values of A5, A10, A20, MCF, a–angle and MCE and higher values of CFT and LI60. Within the IUGR group, pH is negatively correlated with LI30 and LI60, and GA is positively correlated with LI30 and LI60. Birth weight seems to be weakly positively correlated with LI60. CB platelet count is positively correlated with A5, A10, A20, MCF, alpha–angle and MCE and negatively correlated with CFT. CB hemoglobin is inversely correlated with the same parameters.

Conclusion: IUGR neonates appear with hypocoagulable and hypofibrinolytic profile, lower clot strength and elasticity, prolonged clot kinetics. As this is the first study evaluating NATEM parameters in IUGR neonates, larger studies are needed to validate our results.

None declared