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Early Thromboelastographic Phenotypes in Severe Postpartum Hemorrhage: A Multicenter Observational Cohort Study

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Background

- Severe postpartum hemorrhage (PPH) remains a leading cause of maternal morbidity, yet it is unclear whether coagulation profiles differ by etiology of PPH among patients with severe PPH
- Thromboelastography (TEG) 6s is a viscoelastic hemostatic assay that can demonstrate low fibrinogen during PPH >1000mL
- Aim: Explore whether differences exist in early TEG 6s profiles across seven severe PPH etiologies
- We hypothesize that different PPH etiologies will have distinct TEG 6s profiles that are apparent even early in hemorrhage, prior to blood transfusion

1. Cresswell JA. Lancet Glob Health. 2025;13:e626
2. Roberts TCD. Int J Obstet Anesth. 2021;47:103192

Methods

Design

Multicenter, prospective observational cohort study

Six USA academic obstetric centers

Cohort/Population

Severe PPH: receipt of ≥2 units of packed red blood cells (PRBCs) or use and delivery of cell salvage

Samples & Measurements

Citrated whole blood samples obtained during active PPH & prior to transfusion; TEG 6s

Viscoelastic parameters included clot initiation (CK-R), propagation (CK-K, CK-Angle), and fibrinogen-dependent clot strength (CFF-MA, CFF-FLEV)

Categorization

Clinician adjudication of the primary PPH etiology:

- Uterine atony
- Placental abruption
- Retained product of conception
- Hematologic/ coagulopathy
- Uterine rupture
- Uterine hysterotomy extension injury or Genital tract laceration
- Placenta accreta spectrum or abnormal placentation

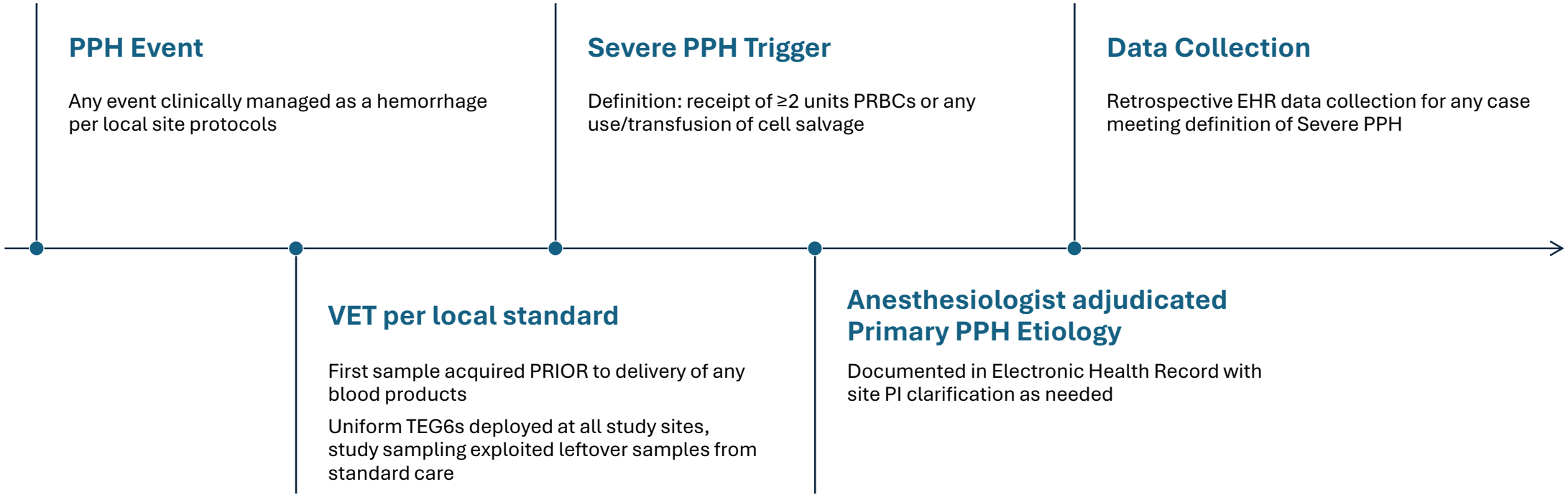
Analysis

Violin plots : distribution of TEG parameters stratified by primary PPH etiology

Analysis

Comparisons of TEG parameters across the five most prevalent postpartum hemorrhage etiologies were performed using the Kruskal-Wallis rank-sum test

Clinical Timeline for Sample Data Acquisition



RESULTS

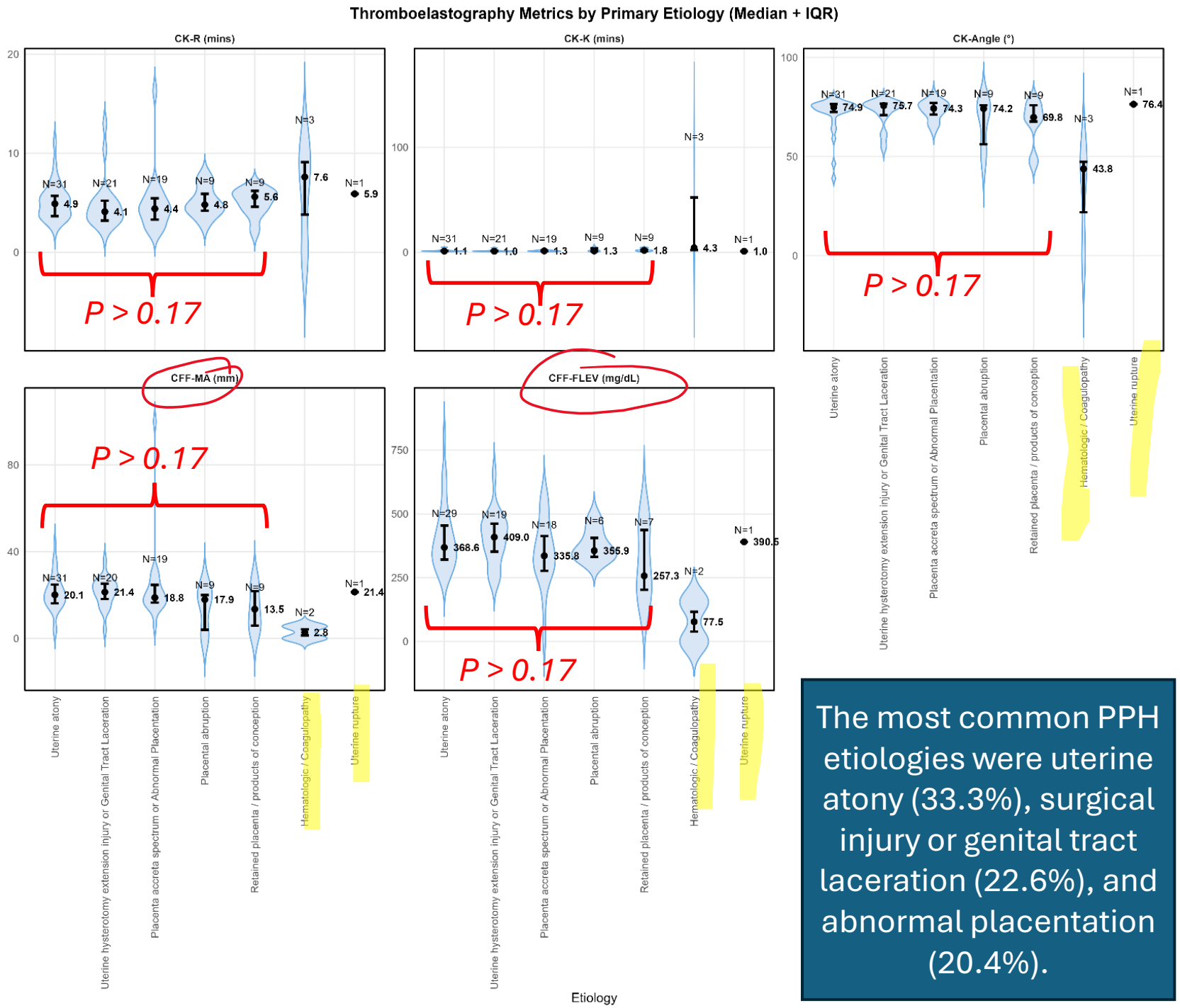


Figure 2. Distribution of thromboelastography parameters by primary hemorrhage etiology.
Violin plots display the distribution of thromboelastography (TEG) metrics stratified by primary postpartum hemorrhage etiology, including CK reaction time (CK-R), clot kinetics time (CK-K), clot formation angle (CK-Angle), citrated functional fibrinogen maximum amplitude (CFF-MA), and citrated functional fibrinogen level (CFF-FLEV). For each etiology, the central marker denotes the median and the vertical bar indicates the interquartile range (IQR). The width of each violin reflects the kernel density of observed values. Sample sizes for each etiology are shown above the distributions.

The most common PPH etiologies were uterine atony (33.3%), surgical injury or genital tract laceration (22.6%), and abnormal placentation (20.4%).

Early TEG profiles in severe PPH are broadly similar across common etiologies

Greater variability observed in fibrinogen-related measures in cases of coagulopathy, and uterine rupture

Future target for clinical trials

This data informs trial designs aimed at determining whether precision, etiology-informed fibrinogen assessment & replacement improves hemostatic management in severe PPH