TEG in Obstetrics

R α MA LY-30

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Overview

Spoiler: Reading TEG

How TEG is Performed

Patient Blood Management

Clotting cascade, a short version

Postpartum hemorrhage

Applications in obstetric anesthesia

How to Interpret a Thromboelastogram (TEG)

<table>
<thead>
<tr>
<th>TEG Parameters</th>
<th>What to do</th>
</tr>
</thead>
<tbody>
<tr>
<td>R &gt; 10</td>
<td>FFP (Factors)</td>
</tr>
<tr>
<td>α &lt; 53</td>
<td>Cryoprecipitate (Fibrinogen)</td>
</tr>
<tr>
<td>MA &lt; 50</td>
<td>Platelets</td>
</tr>
<tr>
<td>LY-30 &gt; 3%</td>
<td>Antifibrinolytics (TXA)</td>
</tr>
</tbody>
</table>
TEG Technique

Patient Blood Management

• Risk reduction
• Cost savings
• Increase product availability
The number one risk for postpartum transfusion is antepartum anemia.
Platelet Plug

Clotting Cascade: A Few Updates

- Tissue factor (III) initiates the extrinsic pathway
- Intrinsic pathway is an amplification system
- Factor XII demoted

Thrombin Burst
### TEG vs. Traditional Tests

**TEG**
- 5-15 minutes for most data
- Whole blood coagulation
- Able to differentiate mechanism
- Better predictor of component transfusion
- Reduces use of products

**Traditional Tests**
- 45-60 min
- Component data
- Lack sensitivity

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### Obstetric Use of TEG

**Postpartum hemorrhage**

**Maternal Coagulopathy**

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**Postpartum Hemorrhage: Definition**

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Postpartum Hemorrhage: Components

- Maternal changes
- Massive hemorrhage
- Loss of clotting factors
- Hemodilution
- Early DIC
- Exaggerated thrombin formation

DIC caused by uterine atony is phenotypically different from surgical or traumatic hemorrhage.

Severe PPH: Molecular mechanisms

- Decrease of fibrinogen is an early predictor of the severity of postpartum hemorrhage.

Severe PPH: Molecular Mechanisms


Severe PPH: DIC

The DIC seen in severe postpartum hemorrhage appears to be a result of increased intravascular fibrin formation and exaggerated thrombin activation.

Postpartum Hemorrhage: Interventions

Pharmacologic
- Pitocin
- Methylergonovine
- Carboprost
- Prostaglandin E2

Surgical
- Massage
- Rapid closure
- UAE/L
- Tamponade
- Compression
- Hysterectomy

Blood/Fluid management
- Cell salvage
- IVF
- Point of care testing
- Transfusion
Postpartum Hemorrhage

- TEG
  - Reduces blood product use
  - Evidence lacking for mortality/morbidity benefit
  - Correlates with fibrinogen decrease

Maternal Coagulopathy

Spinal Hematoma and Neuraxial Anesthesia
Maternal Coagulopathies

- Gestational thrombocytopenia
- Pre-Eclampsia
- HELLP
- Acute fatty liver of pregnancy
- Pre-existing conditions
  - vWD
  - ITP
  - Medication-induced

Maternal Thrombocytopenia

What level is safe?

Maternal Coagulopathy

Use of TEG increasing despite limited evidence.
What about 1:1:x?

Platelet count

Hematocrit

Fibrinogen

INR

Result of storage defects and preservation products

Evidence is weak, controversial, consists of retrospective studies confounded by survivorship bias

"The most influential way of reducing transfusion is following established transfusion guidelines, using algorithms that optimize the transfusion of plasma and platelets and, most importantly, recognizing that patients, and not purely full blood count numbers, should be treated. An anemic patient without symptoms or co-morbidities, which represents the vast majority of our patients, should not be transfused."


TEG Examples
References