Implementing a Standardized Screening and Treatment Algorithm for Anemia in Pregnancy

Ariel Moskowitz, MD PGY-2

HCMEDICAL CITY HEALTHCARE
UNT-TCU Graduate Medical Education Program
Obstetrics and Gynecology
Arlington, TX
Our mission

Above all else, we are committed to the care and improvement of human life.
Agenda

• Problem
• Literature Review
• Root Cause Analysis
• Process Map & Approach
• Results
• Next Steps
Problem Statement

• Anemia in pregnancy is a global health problem
• The American College of Obstetricians (ACOG) and Gynecologists and the Centers for Disease Control and Prevention (CDC) recommend screening for anemia at the initial prenatal visit and again between 24-28 weeks gestation\(^1\)
• There are no standardized evidenced based algorithms for treating anemia in the antenatal period
Background

• Anemia in pregnancy is defined as Hemoglobin/Hematocrit of less than 11/33 in the 1st and 3rd trimesters and 10.5/32 in 2nd trimester\(^1\)

• Anemia is associated with significant maternal and fetal complications\(^1\)

• An estimated >40% of pregnancies are complicated by anemia globally\(^2\)

• Iron deficiency anemia accounts for 75% of anemia in pregnancy\(^3\)

• Prevalence of iron deficiency anemia in pregnancy is disproportionally high amongst African Americans\(^1\)

• The rate of postpartum blood transfusions in the US is 3%\(^4\)
Complications of Anemia in Pregnancy

- **Fetal**
  - Low birth weight
  - Preterm delivery

- **Maternal**
  - Postpartum hemorrhage
  - Morbidity

- **Healthcare system**
  - ICU admissions
  - Transfusions
Project Charter

- Ariel Moskowitz, MD - OBGYN
- Nicole Tenzel, MD, Asst. Program Director - OBGYN
- Joshua Mangels, MD – Transitional Year
- Lyndsay Millican, B.S - MSIII, TCOM
- Timothy Kremer, MD – Program Director - OBGYN
- Sherrie Dixon – Office Manager, MCWC
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Root Cause Analysis

Lack of standardization of anemia screening and treatment during pregnancy
Process Mapping: Current

Initial OB Visit
- Prenatal Panel with CBC

28 Week Visit
- CBC
- GTT
- 3T Labs

36 Week Visit
- GBS

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Process Mapping: Proposed

Initial OB Visit
- Prenatal Panel with CBC
- Hg Fractionation

28w Visit
- CBC
- GTT
- 3T Labs

36w Visit
- GBS
- CBC
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Treatment Algorithm

CBC

Hg ≤ 10.5
- PO iron
- Repeat CBC 4-6w
  - Hg stable or improved
    - Continue PO iron
  - Hg declining
    - IV iron

Hg > 10.5
- Routine care
Methods

- **Plan:** improve detection and management of anemia in pregnancy
- **Predictions:** decrease incidence of anemia upon admission for labor and delivery and postpartum transfusion rates
- **Goal:** Create a standardized screening and treatment algorithm for antenatal anemia detection and management
- **Criteria:** New obstetrical patients at Medical City Womens Care who established care prior to 20 weeks gestation after July 1, 2023
## Results Table

<table>
<thead>
<tr>
<th></th>
<th>Total (n)</th>
<th>Hg Fraction (%)</th>
<th>28w CBC (%)</th>
<th>Anemic (%)</th>
<th>PO Iron (%)</th>
<th>Repeat CBC (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre (7/22-6/23)</td>
<td>101</td>
<td>24.8</td>
<td>92.1</td>
<td>35.6</td>
<td>63.9</td>
<td>47.2</td>
</tr>
<tr>
<td>Post (12/23-4/24)</td>
<td>71</td>
<td>73.2</td>
<td>91.5</td>
<td>29.6</td>
<td>52.4</td>
<td>57.1</td>
</tr>
</tbody>
</table>
Results

Figure 1. Comparison of rates of compliance for hemoglobin fractionation, 24-28w CBC, initiation of PO iron if patient was found to be anemic, and follow-up CBC in the third trimester if patient was diagnosed with anemia.
Results

• Compliance for obtaining initial CBC was 100% both pre- and post-implementation

• Screening for underlying hemoglobinopathies increased from 24.8% to 73.2%

• Compliance rates for 28-week CBC were similar at 92.1% and 91.5%, respectively

• Overall incidence of antenatal anemia decreased from 35.6% to 29.6%
  
  o Unknown why overall incidence of anemia decreased, however may in part be due to decreased incidence of late to care or late transfer obstetric patients

• Management of anemia once diagnosed continues to be an area of improvement, as rates of PO iron implementation decreased from 63.9% to 52.4%

• Surveillance of anemia and trending response to treatment did improve as indicated by increased rates of repeat CBC from 47.2% to 57.1%. Nevertheless, this also provides an area where further improvements can be made.
Conclusion

• Limitations
  o Small sample size
  o Increased turnover of office staff
  o Multiple physicians in the practice and new residents
  o Lack of patient education resources

• Goals
  o Decrease incidence of anemia upon admission for delivery
  o Decreased need for postpartum transfusions

• Next Steps
  o Additional cycles planned through July 2024
  o Standardized orders and documentation for antenatal screening recommendations
  o Continue to improve compliance rates for management of antenatal anemia
  o Transition to original research comparing rates of anemia upon admission and postpartum transfusions
References


Questions & Discussion