Pre-pregnancy Health Status and the Risk of Preterm Delivery

Jennifer Haas, MD
Elena Fuentes-Afflick, Anita Stewart, Rebecca Jackson, Mitzi Dean, Phyllis Brawarsky, Gabriel Escobar
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Pre-term Delivery

• National public health priority.
• Incidence is rising; twice as high among black women compared with whites.
• Despite extensive evaluation, our understanding is incomplete.
• Policies – like expansions of public coverage programs – have had limited effect.
Hypothesis

• Focus on the prenatal period is too narrow.
• Too late to:
  - Modify health behaviors.
  - Identify and treat chronic illness.
  - Identify and treat infection.
  - Improve maternal health status.
Project WISH (Women and Infants Starting Healthy)

- Goal to examine the relationship between a woman’s pre-pregnancy health status and her risk of subsequent preterm delivery.
- Longitudinal cohort of women:
  - Received prenatal care at an office/clinic affiliated with 6 delivery hospitals in San Francisco area.
  - > 18 years; English, Spanish, or Cantonese
  - Presented before 16 weeks gestational age.
  - Access to a telephone.
Procedures

- **Series of up to 4 telephone interviews:**
  - Before 20 weeks - recall health status during the month prior to pregnancy.
  - 24 – 28 weeks
  - 32 – 36 weeks
  - 8 – 12 weeks post-partum.

- **Medical record review**
  - Gestational age at delivery.
  - Adequacy of prenatal care.
Measurements

- Health status:
  - MOS SF-36 (physical function, vitality).
  - CES-D (depression)

- Detailed demographics

- Chronic illness
Variables

- **Outcome**: preterm delivery (< 37 weeks GA).
- **Independent variables**: Age, race/ ethnicity, country of birth, marital status, education, economic deprivation, parity, exercise prior to pregnancy, pre-pregnancy BMI, chronic conditions, pregnancy complications, tobacco use (before/ during), prenatal care, physical function, depression.
Conceptual Framework/ Analysis

• Perinatal Health Framework
  – “Distal” determinants: demographic and socioeconomic characteristics
  – “Proximal” determinants: biomedical conditions and behavioral practices.

• Series of 3 logistic regression models:
  – SES only
  – SES + pre-pregnancy factors
  – SES + pre-pregnancy + prenatal factors
Results

- Response rate = 63%; retention > 90%.
- Final sample of 1,619 women.
- Median age 30 years; 47% nulliparous
- Race/ethnicity:
  - 35% Latina, 32% white, 18% black, 15% Asian
  - 60% US-born
- Education:
  - 16% < HS; 43% HS grad; 41% college grad
- Rate of preterm delivery 8.0%
Changes in Health Status During Pregnancy

Month Prior to Conception  24 - 28 weeks of gestation  32 - 36 weeks of gestation  8 - 12 weeks postpartum

Physical Function  Vitality
Changes in Depression

- Month Prior to Conception
- 24 - 28 weeks of gestation
- 32 - 36 weeks of gestation
- 8 - 12 weeks postpartum

Depressive Symptoms
Multivariate Models: Model 1 – Demographics only.

- Race/ethnicity (relative to white):
  - African American: 1.94 (1.07-3.51)
  - Latina: 1.11 (0.58-2.11)
  - Asian: 1.07 (0.55-2.12)

- Education (relative to college graduate):
  - High school graduate: 1.68 (1.01-2.79)
  - Did not finish high school: 1.82 (0.92-3.59)
Model 2 – Demographic + Pre-pregnancy Risk Factors

- Poor physical function: 2.31 (1.41-3.77)
- Depressive symptoms: 1.21 (0.71-2.08)
- Chronic HTN: 3.12 (1.94-5.02)
- Other chronic conditions: 1.46 (1.00-2.13)
- Smoker: 2.20 (1.29-3.75)
- No exercise: 1.21 (0.79-1.86)
Model 3 – Demographic + Pre-pregnancy Risk Factors + Prenatal Factors

- Race/ethnicity (relative to white):
  - African American: 1.57 (0.84-2.94)
  - Latina: 1.03 (0.53-2.02)
  - Asian: 0.87 (0.42-1.77)

- Prior poor physical function: 1.97 (1.18-3.30)
- Chronic HTN: 1.77 (1.02-3.06)
- Pregnancy-associated HTN: 3.17 (1.87-5.37)
- Other pregnancy conditions: 2.24 (1.33-3.78)
Relative Contribution of Demographic, Pre-Pregnancy, and Pregnancy Factors

- Demographics: 47%
- Pre-Pregnancy: 13%
- During Pregnancy: 40%
Limitations

• Retrospective recall of pre-pregnancy health
  - Occurred before outcome assessment
  - Similar or better than normative data for non-pregnant, reproductive-age women.

• Not causal.

• Maternal health in the immediate pre-conception period.
Conclusions

• Maternal health status, specifically physical function, prior to pregnancy is associated with the risk of preterm delivery.

• Improving the rates of preterm delivery may require attention to the health status of women before pregnancy.