INTERPREGNANCY INTERVAL AND NEONATAL OUTCOMES

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Abstract

Objective: Determine the relationship between interpregnancy interval (IPI) and neonatal outcomes, including preterm birth (gestational age <37 weeks), low birth weight (<2500g), and small for gestational age (birth weight <10th percentile for gestational age), respiratory morbidities, and neurological morbidities.

Study Design: Retrospective cohort study comparing neonatal outcomes across 6 categories of IPI using data from Arizona birth certificates and the Newborn Intensive Care Program. Comparisons between groups were evaluated by calculating odds ratios and 95% confidence intervals. Logistic regression will be conducted to adjust for sociodemographic factors.

Results: Analysis included 207,439 cases. Table 1 shows odds ratios and 95% confidence intervals for neonatal outcomes by IPI.

Conclusions: Significant differences in neonatal outcomes (preterm birth, low birth weight, and small for gestational age) were observed between IPI categories. Interpregnancy intervals of 6 months and 36 months appear to be associated with increased risk of poor neonatal outcomes.

Study Design

Retrospective cohort study comparing neonatal outcomes across 6 categories of IPI.

The dataset used for this study contained data from the Newborn Intensive Care Program (NICP) in Arizona birth certificate data from 1994 to 2013.

Inclusion criteria:
- Infants born in Arizona
- Data available in NICP program

Exclusion criteria:
- Missing values

Study Population

207,439 cases involved in the analysis
- Age single: 15-54 yrs
- Race / ethnicity:
  - Caucasian: 43.9%
  - Hispanic (Any): 35.3%
  - Native American: 5.3%
  - Other: 10.4%

- IPI categories:
  - < 6 months: 1.6%
  - 6-11 months: 12.7%
  - 12-23 months: 15.4%
  - 24-35 months: 11.3%
  - 36-47 months: 22.5%
  - 48-59 months: 18.6%
  - 60 months: 16.4%

Methods

Of 59,969 infants enrolled in the NICP, 58% were matched to Arizona birth certificates. NICP data and azinet data from the infant's birth certificate were combined into a single case.

IPI was calculated by determining the time interval between births and subtracting the gestational age of the case neonate.

IPI categorization into groups was consistent with previous research. Comparisons between IPI groups were evaluated by calculating odds ratios and 95% confidence intervals. Logistic regression was conducted to adjust for the effects of sociodemographic factors, preterm birth, and low birth weight on neonatal morbidities.

Introduction

Interpregnancy interval (IPI) is the time period between a woman giving birth and the conception of a subsequent pregnancy. The length of this time period can have important implications for maternal and infant morbidity and mortality.

- IPI < 12 months and > 59 months is associated with increased risk of preterm birth, low birth weight, and SGA
- Very short IPI (< 6 months) is associated with increased risk of preterm birth and neonatal death

Previous Studies of IPI

- IPI < 6 months associated with increased risk of neonatal death
  - (Smith, 2008; Dough, 2009)
- IPI of 12-23 months had lowest risk of poor birth outcomes
  - (Doherty, 2009)
- IPI < 18 months or > 23 months associated with increased risk of poor birth outcomes
  - (Siu, 2008)
- IPI < 18 months and > 59 months associated with preterm birth, low birth weight, and SGA
  - (Doherty, 2009)
- IPI < 6 months associated with increased risk of preterm birth
  - (Rodriguez & Beroza, 2007)

Objective: Determine the relationship between interpregnancy interval and the following neonatal outcomes and morbidities:

- Preterm birth (gestational age <37 weeks)
- Low birth weight (<2500g)
- Small for gestational age (birth weight <10th percentile)
- Respiratory morbidities
- Neurological morbidities
- Other morbidities

Results

- Preterm birth (gestational age <37 weeks)
  - IPI of 0-6 months: 11.4%, IPI of 12-23 months: 8.7% (p < 0.05)

- Low birth weight (<2500g)
  - IPI of 0-6 months: 14.2%, IPI of 12-23 months: 11.3% (p < 0.05)

- Small for gestational age: IPI of 0-6 months: 12.7%, IPI of 12-23 months: 9.8% (p < 0.05)

- Respiratory morbidities: IPI of 0-6 months: 16.3%, IPI of 12-23 months: 12.4% (p < 0.05)

- Neurological morbidities: IPI of 0-6 months: 18.5%, IPI of 12-23 months: 14.6% (p < 0.05)

Discussion

- Consistent with prior studies, IPI of < 6 months showed increased risk of low birth weight, preterm birth, and small for gestational age. These relationships persisted when adjusted for other predictors.

- IPI between 6-12 months and 12-23 months carried the greatest risk of neonatal morbidities, including preterm birth, low birth weight, low Apgar scores, and admission to the neonatal intensive care unit. None of the relationships between IPI and specific neonatal morbidities remained significant when adjusted for both weight, gestational age, and demographics, suggesting that the risk is mediated through IPI's effect on birth weight and gestational age.

- IPI remains a modifiable variable that could be an important target for intervention.

Future Directions

1. Consider additional analysis of relationship between IPI and maternal outcomes (e.g., pregnancy-related morbidities, mode of delivery, obstetric complications, etc.)

2. Examining models of preconception and interconception care to identify successful interventions to help women achieve optimal birth spacing.