INTERPREGNANCY INTERVALS AND LABOR DYSTOCIA: FINDINGS FROM MICHIGAN PRAMS, 2006-07

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BACKGROUND

Labor dystocia is responsible for approximately 40% of all cesarean deliveries in the U.S. and half of repeat cesareans.[1]

Previous research conducted in Michigan by Zhu, et al examined long intervals, compared to intervals <2 years, in MI from 1994-2002.[2] Information about labor dystocia was obtained from hospital discharge data in the MI Inpatient Database. Interpregnancy Intervals were calculated from birth certificate variables. Prevalence of labor dystocia was ~21% among all births from 1994-2002. First births were excluded from analysis. Long intervals were associated with increasing odds of dystocia compared to intervals <2 years (OR=1.5 for 10+ years).

In 2005, WHO recommended an interval of at least 24 months between pregnancies, in order to avoid the interpregnancy interval range associated with the highest risk for several negative maternal and infant outcomes.[3] The recommendation was a compromise between two schools of thought regarding the available research: those who believed the evidence supported 18 months as an adequate minimum interval and those who interpreted the evidence as indicating 27 months between pregnancies was safest.

STUDY QUESTION

Could we assess the short (<18 months) and long (≥24 months) interpregnancy intervals' association with labor dystocia in the Pregnancy Risk Assessment Monitoring System (PRAMS) population?

METHODS

DATA COLLECTION

MI PRAMS is an ongoing, population-based surveillance system of factors affecting negative perinatal outcomes. It monitors selected maternal experiences and behaviors that occur before and during pregnancy and during early infancy. Participants are selected from a random, stratified sample of live birth certificates, and the data is weighted to respresent the entire population of in-state births to resident mothers each year. Questionnaire data is collected by a combination of mail and telephone surveys.

STATISTICAL ANALYSIS

Multinomial logistic regression was performed using SUDAAN® version 10.0.1. Short and long intervals were compared to the optimal interval of 18 to <24 months. Potential confounders considered were, maternal age, race/ethnicity, education, marital status, pre-pregnancy insurance status, parity, trimester of entry into prenatal care, smoking during pregnancy, and previous cesarean delivery.

TABLE 1. PREVALENCE OF LABOR DYSTOCIA BY MATERNAL CHARACTERISTICS

Characteristic	Sample Frequency (n)	Weighted Frequency (N)	Weighted Percent	95% Confidence Interval
Labor Dystocia	376	26,604	25.1	(22.6-27.8)
Maternal Age				
<20	7	271	8.1	(3.7-16.9)
20-29	168	11,141	21.5	(18.2-25.2)
30+	201	15,193	29.9	(26.1-34.0)
Maternal Race/Ethnicity				
White	209	18,498	24.6	(21.5-28.0)
Black	135	5,170	26.7	(22.9-30.9)
Hispanic	13	1,317	29.1	(16.8-45.4)
Other	12	1,029	28.9	(16.0-46.4)
Maternal Education				
HS or Less	161	11,646	23.9	(20.2-28.0)
Some College+	206	14,426	26.0	(22.6-29.7)
Marital Status				
Married	242	18,777	26.0	(22.9-29.4)
Un-married	134	7,827	23.3	(19.3-27.8)
Insurance Status				
Private	211	16,115	25.1	(21.9-28.6)
Medicaid	90	4,593	23.1	(18.4-28.6)
Uninsured	75	5,896	27.7	(21.8-34.5)
Parity				
2 Children	195	14,446	24.4	(21.1-28.0)
3+ Children	181	12,158	26.1	(22.3-30.2)
Trimester of PNC Entry				
1st Trimester	287	20,280	24.2	(21.4-27.2)
After 1st/No PNC	82	5,901	28.4	(22.7-34.8)
Smoking during Pregnancy				
No	297	21,146	24.4	(21.6-27.3)
Yes	74	5,286	29.3	(23.0-36.6)
Previous Cesarean				
No	316	22,635	27.1	(24.2-30.3)
Yes	60	3,969	17.6	(13.3-22.9)

2006-07 MI PRAMS

TABLE 2. EFFECT OF INTERPREGNANCY INTERVAL ON LABOR DYSTOCIA

Interpregnancy Interval Length	Odds Ratio	95% Confidence Interval
Short (<18 months)	2.79	(1.49-5.23)
Optimal (18 to <24 months)	1.00	Reference
Long (24+ months)	2.43	(1.27-4.65)

2006-07 MI PRAMS

RESULTS

Overall, 25.1% of Michigan women delivering a live birth from 2006-07 experienced labor dystocia during the index birth (Table 1). Covariates that were significant in bivariate analysis were maternal age and previous cesarean section. Both were significant in the multivariate logistic regression model as well.

After controlling for maternal age and previous cesarean section, women who had short interpregnancy intervals were 2.79 more likely to experience labor dystocia than women with the optimal interval (Table 2). Likewise, women with long intervals were 2.43 times more likely to have labor dystocia than the reference group.

CONCLUSIONS

Interpregnancy intervals outside the optimal range of 18 to <24 months were associated with increased odds of labor dystocia. These findings support previous work by Zhu, et al, which found an association between long intervals and labor dystocia.

The current analysis adds to previous work by distinguishing the risks of labor dystocia associated with both short and long intervals. Further research is needed to better understand this relationship and its causes.

PUBLIC HEALTH IMPLICATIONS

PRAMS data may be used to estimate the association between interpregnancy intervals and relatively common perinatal outcomes, such as labor dystocia, at a population level.

This approach is more timely and cost effective than more labor intensive methods involving linkages between datasets.

REFERENCES

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