Length of the Second Stage of Labor and Risk of Preterm Delivery in a Subsequent Pregnancy

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**ABSTRACT**

Objective: Cervical injury is considered an important risk factor for preterm birth. Prolonged or obstructed labor at term may increase the risk for damage to cervical and related tissues. Therefore, we evaluated whether an increased duration of the second stage of labor in a term pregnancy directly influences the risk of spontaneous preterm birth in the subsequent pregnancy.

Study Design: This was a cohort study of women having their first term and subsequent term pregnancy delivered at a single institution. Obstetric data collected electronically from January 2005 to January 2015 were used. The duration of the second stage of labor in the first term delivery was determined by vaginal delivery. Demographic and other clinical data were collected. The risk for spontaneous preterm birth (sPTB) in the subsequent term pregnancy was estimated based on the duration of the second stage of labor regardless of mode of delivery in the first birth.

Results: 6,715 women were identified as eligible for analysis. In the index pregnancy, the rate of second stage cesarean was 6.2% (n=416) and the rate of vaginal delivery was 93.8% (n=6,399). Among the 6,342 women (94.4%) who delivered preterm in the subsequent pregnancy, the median length of the second stage in the first delivery was 55 minutes (interquartile range 29-97). Among the 373 women (5.6%) who delivered preterm in the second pregnancy, the median length of the second stage in the first term delivery was 42 minutes (interquartile range 24-93; p=0.0004) (Flow diagram).

Conclusion: Second stage labor length in the index pregnancy was shorter for women who delivered preterm in a subsequent pregnancy. These data do not support the concept that a longer second labor stage is associated with preterm delivery after a prior term delivery.

**RESULTS**

6,715 women were identified as eligible for analysis (Table 1). The rate of second stage cesarean in the subsequent pregnancy was 19.8% (n=1,311) and the rate of operative vaginal delivery was 20.3% (n=1,362). Median length of the second stage in the first term delivery was 55 minutes (IQR 29-97). Among the 6,342 women (94.4%) who delivered preterm in the second pregnancy, the median length of the second stage in the first term delivery was 42 minutes (IQR 24-93; p=0.0004) (Flow diagram).

Univariate and multivariate analyses were performed to evaluate the risk of preterm delivery in the subsequent pregnancy in relation to the duration of the second stage of labor in the first term pregnancy. In univariate analysis, sPTB was more common in women who delivered vaginally after a short second stage in the first pregnancy (p=0.01; Table 2). After adjustment for potential confounders including maternal age, ethnic origin, smoking, and chronic hypertension, there was a 30% lower risk of sPTB in a subsequent delivery if the second stage of labor length was between 55-96 minutes in the first term delivery (Table 3).

**CONCLUSION**

In our cohort, the second stage of labor in the first term delivery was shorter for women who experienced PTB in a subsequent pregnancy. Our data do not support the concept that an increased injury from the prolonged second labor stage is a significant contributor to preterm birth risk after a prior term delivery. Strengths of our study include the use of large sample size from a single institution to evaluate a population where information is available for two subsequent deliveries. Limitations of our study include lack of detailed individual information regarding obstetric lacerations or cervical injury in women who experience a prolonged second stage or an operative vaginal delivery in their first term birth. Although no difference in the risk of sPTB was noted by the length of second stage in our study population, other aspects of the second stage such as lacerations or surgical trauma may indeed increase the risk of sPTB for some women at an individual level. Future prospective studies could aid in further clarifying this important clinical question.

**REFERENCES**