Prolonged Second Stage of Labour and the Risk for Subsequent Preterm Birth

Yael Sciaky-Tamir, MD, Alon Shrim, MD, Richard N. Brown, MD, FRCOG

McGill University Health Centre, Montreal QC

Department of Obstetrics and Gynecology, Division of Maternal Fetal Medicine, Royal Victoria Hospital, McGill University, Montreal QC

Abstract

Objective: To assess whether prolonged second stage of labour influences the gestational age at the subsequent delivery.

Methods: We performed a retrospective cohort study. Clinical information was retrieved from the McGill Obstetrical and Neonatal Database for the period of January 2001 to February 2008. We evaluated primiparous women with term singleton pregnancies who reached the second stage of labour. Women were divided into two groups, according to the duration of the second stage: delivery after more than three hours of full cervical dilatation, or delivery within three hours. The primary outcome measured was the incidence of spontaneous preterm births at the subsequent delivery.

Results: Among 1818 women whose records were available for analysis, 416 women (22.9%) had a prolonged second stage of labour in their first delivery. Women with a prolonged second stage in their first delivery did not deliver prematurely more often in the successive delivery than those women whose second stage was not prolonged (rate of preterm birth 4.3% in the prolonged second stage group and 5.5% in the normal second stage group; $P = 0.3$).

Conclusion: In our population of primiparous women with a singleton term delivery, a prolonged second stage of labour lasting more than three hours was not associated with preterm birth at their subsequent delivery.

Résumé

Objectif : Déterminer si la prolongation du deuxième stade du travail exerce une influence sur l'âge gestationnel dans le cadre de l'accouchement subséquent.

Méthodes : Nous avons mené une étude de cohorte rétrospective. Les renseignements cliniques ont été récupérés à partir de la *McGill Obstetrical and Neonatal Database* pour la période allant de janvier 2001 à février 2008. Nous nous sommes penchés sur les femmes primipares présentant une grossesse monofœtale à terme qui ont atteint le deuxième stade du travail. Ces femmes ont été réparties en deux groupes, en fonction de la durée du deuxième stade : « accouchement après plus de trois heures en présence d'une dilatation cervicale totale » ou « accouchement dans un délai de trois heures ». L'incidence de l'accouchement préterme spontané dans le cadre de la grossesse subséquente constituait le critère d'évaluation principal.

Résultats : Chez les 1 818 femmes dont les dossiers étaient disponibles aux fins de l'analyse, 416 femmes (22,9 %) avaient connu une prolongation du deuxième stade du travail au cours de leur premier accouchement. Les femmes ayant connu une prolongation du deuxième stade du travail au cours de leur première grossesse n'ont pas accouché de façon prématurée plus fréquemment dans le cadre de leur grossesse subséquente que les femmes n'ayant pas connu une prolongation du deuxième stade du travail (taux d'accouchement préterme : 4,3 % au sein du groupe « prolongation du deuxième stade du travail » et 5,5 % au sein du groupe « deuxième stade normal »; P = 0,3).

Conclusion : Au sein de notre population de femmes primipares ayant connu un accouchement à terme à la suite d'une grossesse monofœtale, une prolongation du deuxième stade du travail au-delà de trois heures n'a pas été associée à la survenue d'un accouchement préterme dans le cadre de la grossesse subséquente.

Key Words: Cervical incompetence, preterm birth, prolonged second stage of labour, risk factors

Competing Interests: None declared.

Received on August 29, 2014

Accepted on October 29, 2014

J Obstet Gynaecol Can 2015;37(4):324–329

INTRODUCTION

Preterm birth complicates 5% to 12% of pregnancies worldwide and is responsible for significant morbidity and mortality in neonates.[1,2] It results principally from the occurrence of spontaneous preterm labour and also to some extent from cervical insufficiency.[3,4] Among commonly accepted pathophysiologic mechanisms responsible for spontaneous preterm labour are inflammation, placental abruption, infection, vascular disease or ischemia, and over-distension of the uterus.[2,5] In addition, several causes for cervical insufficiency, which is typically responsible for late second trimester and early third trimester birth, have been proposed as causes of preterm birth.[2,6] Uterine anomalies, alterations in collagen content or other supportive substances in the cervix, and exposure to diethylstilbestrol

are the congenital causes. Cervical trauma resulting from gynaecological procedures such as dilatation and curettage, cervical conization, or "obstetric" injury during labour contribute to the acquired causes.[6]

Several reports have proposed that prolonged second stage of labour represents a period of vulnerability in which there is a potential risk for long-term cervical injury.[7,8] The aim of our study was to examine whether a prolonged second stage of labour in a delivery at term increases the risk for subsequent preterm birth.

METHODS

We conducted a retrospective cohort study of women who gave birth in consecutive pregnancies at the McGill University Health Centre in Montreal, Quebec. Clinical information was retrieved from the McGill Obstetrical and Neonatal Database (MOND), for the period of January 2001 to February 2008. The MOND database is a computerized obstetric and neonatal database that was created in 1978. Maternal and neonatal data are coded soon after discharge for all deliveries at the McGill University Health Centre in Montreal, Quebec. A dedicated medical coding clerk codes the maternal and infant charts; three professionals (a nurse, an obstetrician, and a neonatologist) assess items that require interpretation to be coded.

We included in the study cohort all primiparous women with a singleton pregnancy who had a trial of labour at term (> 37+0 weeks) and who reached the second stage of labour. The cohort was divided into study and control groups according to the duration of the second stage of labour in this index pregnancy; the study group included women who delivered after a prolonged second stage, defined as longer than three hours, and the control group consisted of women who delivered after a second stage of normal duration (within three hours of full cervical dilatation). All women were assessed in their subsequent delivery. In order to exclude cases of iatrogenic preterm labour, we excluded women who had labour induced for their subsequent delivery for all reasons other than preterm premature rupture of membranes, chorioamnionitis, vaginal bleeding, and cervical dilatation, which are factors or diagnoses that might themselves contribute to spontaneous preterm births. In addition, we searched for specific risk factors for preterm birth in this population.

Analysis was done in three steps: first, demographic and obstetric data were collected and compared for women in both groups, including gestational age at delivery, duration of the second stage of labour, birth weight, rate of macrosomia (defined as birth weight above 4000 g), type of analgesia, and mode of delivery (spontaneous vaginal, instrumental, or Caesarean section).

Next, we focused on women in each group whose prenatal care and delivery in their next pregnancy were at our institution. We compared the two groups for differences in obstetric risk factors for preterm birth.

Finally, in those women who had a subsequent delivery at our institution, we compared the gestational age at delivery and the rate of preterm birth in the two groups.

Statistical analysis was performed using SPSS version 11 (IBM Corp., Armonk NY), using multiple linear regression, Student *t* test and chi square or Fisher exact as appropriate. Significance was set at a *P* value of ≤ 0.05.

Ethics approval for the study was provided by the MUHC Research Ethics Board.

RESULTS

During the study period, 2497 primiparous women gave birth at the McGill University Heath Centre and then had a subsequent delivery at the same institution. Of these, 1818 women had a spontaneous onset of labour in their second pregnancy, or had labour induced for reasons potentially associated with or related to spontaneous preterm birth. Of these 1818 women, 416 had a prolonged second stage of labour in their first pregnancy (study group) and 1402 had a second stage of normal duration in their first pregnancy (control group) (Figure).

Demographic and labour-related data for the index deliveries are presented in Table 1. Women in the study group delivered babies with a higher mean (± SD) weight (3564 g ± 419 vs. 3373 g ± 418; $P < 0.001$), a higher rate of macrosomia (13% vs. 6.9%; $P < 0.001$), and higher rates of both instrumental delivery (20.4% vs. 11.3%; $P < 0.001$) and Caesarean section (18.3% vs. 1.5%; $P < 0.001$). In addition, this group had a higher rate of use of epidural analgesia (93.3% vs. 83.7%; $P < 0.001$).

The two groups did not differ with regard to any of the known risk factors for preterm birth that were recorded, other than marital status and smoking (Table 2).

Obstetric data from the subsequent delivery for the study and control groups are presented in Table 3. The two groups did not differ significantly in either the mean gestational age at delivery or the rate of preterm birth (4.3 % vs. 5.5 %; $P = 0.3$). As in their index delivery, the study group had a significantly longer mean duration of the second stage of labour (0.9 hours ± 1.1 vs. 0.7