



CLINICAL ARTICLE

The effects of mode of delivery and time since birth on chronic pelvic pain and health-related quality of life



Wen-Ying Li^{a,b,*}, Tippawan Liabsuetrakul^b, Babill Stray-Pedersen^c, Ya-Jun Li^a, Li-Jie Guo^a, Wen-Zhi Qin^a

^a Department of Obstetrics and Gynecology, First Hospital of Tsinghua University and Tsinghua University, Beijing, China

^b Epidemiology Unit, Faculty of Medicine, Prince of Songkla University, Hat Yai, Thailand

^c Division of Women and Children, Rikshospitalet, Oslo University Hospital and University of Oslo, Oslo, Norway

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ABSTRACT

Objective: To assess the effects of mode of delivery and time since birth on chronic pelvic pain (CPP) and health-related quality of life (HRQoL) among primiparous Chinese women. **Methods:** Primiparous women of childbearing age who had given birth at least 6 months previously were invited to participate in the present cross-sectional study, which was conducted from October 2011 to April 2012 in the Chaoyang District of Beijing. Time since birth was divided into the following 4 periods: less than 1 year, 1–5 years, 6–10 years, and more than 10 years. The factors associated with CPP status were analyzed using logistic regression. **Results:** Among the 1456 participants, CPP was more common following cesarean delivery (11.2% versus 6.9% among women with a vaginal delivery; $P = 0.007$), and the rate of CPP increased with time since birth (2.3%, 9.3%, 10.7%, and 13.1% for the 4 specified time periods, respectively ($P < 0.001$)). Cesarean delivery, longer time since birth, and CPP were all associated with a lower HRQoL utility score. **Conclusion:** Although the absolute risks were small, cesarean delivery and time since birth were significant risk factors for CPP, which had a negative impact on the participants' HRQoL. © 2013 International Federation of Gynecology and Obstetrics. Published by Elsevier Ireland Ltd. All rights reserved.

1. Introduction

Chronic pelvic pain (CPP) is a common condition among women of reproductive age; however, the reported prevalence varies greatly because of diverse study settings, designs, and definitions [1,2]. Studies from high-income countries [3–6] have reported a 3-month prevalence of 14.7–25.4% among women of childbearing age, whereas the rate in lower-income countries ranged from 5.2% to 43.2% [1]. Apart from being common, CPP is a multifactorial disease that makes it difficult to establish a definite diagnosis, and it is difficult to treat [2,7]. Therefore, CPP is a great burden on the general wellbeing of women who experience it and on national health services [3,4].

Although the etiology is poorly understood, endometriosis, pelvic inflammatory disease, adhesion formation, and irritable bowel syndrome are frequently diagnosed pathologies of CPP [2,7]. Adhesion formation is common after cesarean delivery [8]; therefore, the relationship between cesarean delivery and CPP is conceivable, but it has rarely been assessed. Studies comparing the prevalence of CPP among women undergoing cesarean versus vaginal delivery [9,10] have not shown a consistent association, but these studies were limited by a lack of clearly defining CPP and by focusing on a short time period after birth.

In China, the cesarean delivery rate has increased 12-fold (from 3.4% in 1988 to 39.3% in 2008) nationwide and nearly 7-fold (from approximately 10% in 1988 to 64.1% in 2008) in urban areas [11]. It is important to investigate the health consequences of cesarean delivery given that such a large proportion of the population is affected. Moreover, the 1-child policy makes it easier to assess the long-term consequences of childbirth without confounding by parity or mixed modes of delivery. The present study from China therefore aimed to evaluate the effect of mode of delivery and time since birth on the prevalence of CPP and the health-related quality of life (HRQoL) among primiparous women of reproductive age.

2. Materials and methods

The present cross-sectional study was conducted from October 18, 2011, to April 20, 2012. The target population included primiparous women aged 18–45 years who had given birth at least 6 months previously. The sample size was calculated based on a 35% frequency of noncyclic pelvic pain (excluding dysmenorrhea and dyspareunia) among women with a cesarean delivery and a 20% frequency among those with a vaginal delivery. To detect this difference with a power of 80%, a sample size of at least 300 primiparas (150 per mode of delivery) was needed, assuming a ratio of cesarean to vaginal delivery of 1. To fully examine the effects of time since birth, 4 time periods since birth were defined: less than 1 year, 1–5 years, 6–10 years, and more than 10 years. Allowing for 10% of the data to be incomplete, nearly

* Corresponding author at: No. 6 Jiuxianqiao 1st Street, Chaoyang District, Beijing, China 100016. Tel.: +86 10 64308109, +86 13651395725; fax: +86 10 64361322.

E-mail address: muziwen9999@hotmail.com (W.-Y. Li).

1350 primiparas were required to examine the influence of these 4 time periods.

Originally, the participants were recruited by visiting the workplaces of health personnel at the First Hospital of Tsinghua University (FHTU), factory workers, and school teachers in the Chaoyang District of Beijing. The women received information about the study from their managers and the researchers then met the women at specified locations. However, primiparas within the 1-year postpartum period were rare in the workplace. Therefore, additional participants identified from the FHTU birth records were invited to participate by phone. The study was approved by the Ethics Committee of the Faculty of Medicine, Prince of Songkla University, Songkhla, Thailand, and the Ethics Committee of the FHTU. All participants were provided with information regarding the study and signed a consent form prior to data collection.

The women completed a self-administered questionnaire, and information about pelvic pain was obtained via interview. The process lasted 30–40 minutes.

A modified version of the Pelvic Pain Assessment Form [12] of the International Pelvic Pain Society was used for the interview. A structured English version was developed by searching the literature, followed by validation by 3 experts working in the reproductive health field using a content validity index (0.89–0.92). After validation, the pelvic pain questionnaire was translated into Chinese and back-translated into English. Two English versions were checked and the Chinese version was modified as necessary. The questionnaire was then pretested among 45 study participants to check for comprehensibility and reliability (Cronbach $\alpha = 0.73$) of the questions. After further modification, the final version was used for data collection.

The questions regarding noncyclic pelvic pain included the following: “In the previous 3 months, have you ever had any pelvic pain, either constantly or intermittently? By pelvic pain, I mean pain below the belly button or in the female organs that is not related to pregnancy, periods, or vaginal intercourse” and “Have you ever had any pelvic pain before the past 3 months?” If the participant answered “yes” to either question, further questions followed regarding the occurrence of pain before or after delivery, the duration of pain, the presence of a doctor’s diagnosis if the participant had sought medical help, the outcome of treatment (cure, relief, worsened symptoms, no effect), and the impact of pain on daily life.

The outcome variables were CPP and HRQoL. Chronic pelvic pain was defined as pelvic pain that had been present for at least 6 months, began after delivery, and was unrelated to pregnancy, dysmenorrhea, or dyspareunia. The HRQoL was measured using a simplified Chinese version of the 3-level 5-dimensional EuroQol questionnaire (EQ-5D-3L) [13]. The questionnaire consists of a descriptive system of HRQoL states with 5 dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) and a visual analog scale (EQ-VAS). Each dimension has 3 response options (no problems, some problems, and extreme problems). Responses to the descriptive system were transformed into a utility index score based on an algorithm from the UK [14]. The EQ-VAS score represents the respondents’ self-rated health ranging from 0 to 100.

Independent variables included the mode of delivery, time since birth, education, occupation, monthly household income, previous or current use of an intrauterine device (IUD), history of induced abortions, chronic medical condition, psychological disease, other abdominal surgery, and current depressive symptomatology. An income cut-off point of 900 USD was used, which represents twice the average income per capita in Beijing [15]. Chronic medical conditions included hypertension, diabetes, hyperlipidemia, and endocrine disease requiring medication or medical consultation. Psychological disease was defined as a condition that was diagnosed by a psychiatrist. Current depressive symptomatology was defined as a score of 10 or more on the validated Chinese version of the Edinburgh Postnatal Depression Scale (EPDS) questionnaire [16].

The data were recorded in EpiData version 3.1 (EpiData Association, Odense, Denmark) and analyzed using R version 2.15.1 (R Foundation

for Statistical Computing, Vienna, Austria). Bivariate analysis of mode of delivery, CPP status, and depressive symptomatology was performed using the χ^2 test for categorical variables and the Wilcoxon rank-sum test for continuous variables. Variables with $P < 0.2$ were included in logistic regression models for CPP status and depressive symptomatology. The effects of mode of delivery, time since birth, and CPP status on the EQ-5Q utility score and the EQ-VAS were analyzed using the Wilcoxon rank-sum test and the Kruskal–Wallis test. $P < 0.05$ was considered statistically significant.

3. Results

The study included a total of 1456 participants. Of these, 186 women were recruited from the FHTU birth records (response rate 186/364 [51.1%]); the remaining participants were recruited through workplace visits (response rate 1270/1579 [80.4%]). The data were incomplete for 33 women (missing CPP data: $n = 18$ CPP; missing depressive symptomatology data: $n = 17$; missing EQ-5D data: $n = 8$). There were no significant differences in terms of demographics or socioeconomic status between these women and those who completed the questionnaire. The number of women in the 4 time groups was 307 (less than 1 year since birth), 374 (1–5 years since birth), 380 (6–10 years since birth), and 395 (more than 10 years since birth).

In total, 766 (52.6%) women had a cesarean delivery and 690 (47.4%) had a vaginal delivery. The cesarean delivery rate was higher among those who had given birth in the preceding 10 years, had a higher education, had a higher household income, or worked as teachers or health personnel (Table 1). Cesarean deliveries were also more common among women who did not use an IUD, those with a history of induced abortion, those with a chronic medical condition, and those with CPP.

Overall, 132 (9.1%) women developed CPP after delivery. The rate of CPP increased with increasing time since birth (Fig. 1) and was 2.3% ($n = 300$), 9.3% ($n = 365$), 10.7% ($n = 374$), and 13.1% ($n = 389$) for women who had given birth less than 1 year ago, 1–5 years ago, 5–10 years ago, and more than 10 years ago, respectively ($P < 0.001$). Cesarean delivery, time since birth, occupation, use of an IUD, and history of induced abortion were found via logistic regression to be significant

Table 1
Characteristics of the study participants according to mode of delivery ($n = 1456$).^a

Characteristic	Vaginal delivery ($n = 690$)	Cesarean delivery ($n = 766$)	<i>P</i> value
Time since birth			0.007
<1 year	150 (21.7)	157 (20.5)	
1–5 years	170 (24.6)	204 (26.6)	
5–10 years	158 (22.9)	222 (29.0)	
>10 years	212 (30.7)	183 (23.9)	
Education			<0.001
Middle school or lower	51 (7.4)	30 (3.9)	
High/technical school	151 (21.9)	132 (17.2)	
College or higher	488 (70.7)	604 (78.9)	
Occupation			<0.001
Housewife/part-time worker	107 (15.5)	101 (13.2)	
Regular worker	407 (59)	355 (46.3)	
Teacher	75 (10.9)	92 (12.0)	
Health personnel	101 (14.6)	218 (28.5)	
Monthly household income ≥ 900 USD	430 (62.3)	547 (71.4)	<0.001
Use of an intrauterine device	203 (29.4)	147 (19.2)	<0.001
History of induced abortion	334 (48.4)	447 (58.4)	<0.001
Chronic medical condition	31 (4.5)	62 (8.1)	0.007
Other abdominal surgery	48 (7.0)	63 (8.2)	0.42
Psychological disease	6 (0.9)	9 (1.2)	0.75
Current depressive symptomatology ^b	109 (16.1)	134 (17.6)	0.47
Chronic pelvic pain ^c	47 (6.9)	85 (11.2)	0.007

^a Values are given as number (percentage).

^b Data were missing for 17 women.

^c Limited to symptoms occurring after delivery; data were missing for 18 women.

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