

Primary cesarean section in term, low-risk multiparous women: a single clinic retrospective observational study

Abstract

Background: Multiparous women who have previously delivered vaginally are generally considered to be at low risk for cesarean section. We aimed to determine the incidence rate and indications for primary cesarean section and operative vaginal deliveries among multiparous women with previous vaginal births.

Patients and methods: Multiparous women who had delivered their babies in our clinic between January 2004 and December 2019 were enrolled in this retrospective observational study. The inclusion criteria were as follows: delivery at 37 weeks of gestation or more, singleton pregnancy with a live fetus, had one or more past vaginal deliveries including instrumental vaginal birth, and no history of previous cesarean section. Women with placenta previa, abruptio placentae, severe pregnancy-induced hypertension, and uncontrolled medical diseases were referred to tertiary hospitals and excluded from this study. The frequency of occurrence and indications for cesarean section and vacuum extraction, duration of labor, and the effect of induction of labor on the cesarean section rates were analyzed.

Results: A total of 3094 multiparous women were enrolled. Primary cesarean section was performed in 30 women ($30/3094=0.97\%$). The indications for cesarean section included the following: breech presentation in 28 women, myomectomy after the first vaginal birth in one (of 29 elective cesarean sections), and failed vacuum extraction after a prolonged second stage in one (one emergency cesarean section). Vacuum extraction was performed in 61 women ($61/3094=2.0\%$), the indications for which were non-reassuring fetal status ($n=38$), prolonged 2nd stage of labor ($n=10$), and narrow pelvic outlet ($n=10$). Vaginal breech delivery occurred in 11 women. Induction of labor ($n=402$) did not affect the cesarean section rate.

Conclusion: In multiparous women, breech presentation was the main indication for primary cesarean sections, and the cesarean section rate was very low in women with cephalic presentation.

Keywords: primary cesarean section, multipara, indication

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Introduction

The rate of cesarean sections has been rising worldwide, and cesarean sections could recur in subsequent pregnancies in nulliparous women.¹ It is considered that if the first baby is delivered vaginally, subsequent low-risk pregnancies could also end in vaginal deliveries. Conversely, many reports have revealed that cesarean birth is not uncommon among the multipara with history of previous vaginal deliveries.²⁻¹¹ However, these studies included high-risk pregnancies such as placenta previa and preterm labor.

Primary cesarean section in a multipara means the first cesarean section performed in a woman who has delivered vaginally at least once previously.² The primary cesarean delivery rate in multiparous women is defined as the percentage of cesarean deliveries out of all births for women who have not had a cesarean delivery earlier.^{3,11} In this study we examined the frequency and indications for primary cesarean section among the term low-risk multipara, and aimed to find an answer to the question, “why do the multiparous women with a history of vaginal delivery give birth by cesarean section?”¹²

Patients and methods

All multiparous women who underwent deliveries at our clinic between January 2004 and December 2019 were enrolled. The clinic is located in Shizuoka City, which has a population of approximately 700,000 in central Japan. The inclusion criteria were as follows: delivery at 37 weeks of gestation or more, singleton with a live fetus, having had one or more vaginal deliveries including instrumental births with no previous cesarean sections. We included only those women regarded as having low-risk pregnancies. The women with high-risk pregnancies, such as those involving placenta previa, abruptio placentae, severe pregnancy-induced hypertension, severe obesity, and uncontrolled diabetes mellitus, were referred to tertiary care hospitals and excluded from this study. Vacuum extraction was employed when appropriate, but forceps delivery was not performed in our clinic. The duration of the 1st and 2nd stages of labor for vaginal deliveries was also examined. This study was approved by the institutional ethics committee (No.20005). All statistics analyses were performed using Microsoft Excel for Mac 2011 (version 14.7.7).

Results

A total of 3,094 multiparous women were enrolled in the study. Their demographic and clinical characteristics are presented in Table 1. A primary cesarean section was performed in 30 women (30/3094=0.97%). The indications for cesarean section were as follows: breech presentation in 28 women, myomectomy after the first vaginal birth in one (also termed 'scarred uterus'), and failed vacuum extraction after a prolonged second stage of labor in one. Thus, we performed 29 planned cesarean sections and one unplanned emergency cesarean section (Table 2A). There were 11 vaginal breech deliveries. Therefore, 2 out of 3,055 women (0.07%) with cephalic presentations and 28 out of 39 women (71.8%) with breech presentation underwent cesarean section. Vacuum extraction was performed in 61 out of 3,094 women (61/3094=2.0%). The indications were: non-reassuring fetal status in 38 women, prolonged 2nd stage of labor in 10, narrow pelvic outlet in 10, and weak pains in 13 (some had two indications) (Table 2B).

Table 1 Demographics and clinical characteristics of the analyzed women (N=3094)

Characteristics	Number
Age (years)	32.4±4.2
parity	*1.2 [1, 5]
Height (cm)	158.3±5.2
Pre-pregnancy weight (kg)	51.6±7.2
Body mass index (kg/m ²)	20.6±2.7
Gestational age (days)	275±7
Neonatal weight (g)	3076±344
¶ Duration of labor (min)	#283 [123, 620]
Induction of labor (n)	402 (13.0%)
Epidural use (n)	98 (3.2%)
Stillbirth (n)	2 (0.06%)

• Data are presented as mean±standard deviation

• *mean [range], #median [10th percentile, 90th percentile]

†Vaginal delivery (N=3064)

Table 2 Indications for cesarean sections and vacuum extractions in the multipara

A. Indication of cesarean sections (N=30)	
Breech presentation	28
Myomectomy after the first delivery	1
Failed vacuum extraction	1
B. Indication of vacuum extractions (N=61)	
Non-reassuring fetal status	38
Prolonged second stage of labor	10
Narrow pelvic outlet	10
Weak pains/maternal fatigue	13

Note: Some had two indications

Of 3,065 women (excluding the 29 planned cesarean sections), 402 women underwent induction of labor, among whom one woman delivered by cesarean section. All women with a spontaneous onset of labor (N=2663) underwent a vaginal delivery (Table 3). Induction of labor did not affect the cesarean section rate (Table 3). The median durations of the 1st and 2nd stages of labor were 260 min and 13 min, respectively. The 95th percentile for the duration of the 1st and 2nd stages of labor was 720 min and 58 min, respectively. Seventeen women had the 1st stage of labor for longer than 20 h, and 10 women had the 2nd stage of labor for longer than 3 h (Table 4).

Table 3 Induction of labor and incidence of cesarean section

Induction of labor	Cesarean section	Vaginal delivery
(+)	1	401
(-)	0	2663

P=0.274 (χ-square test with Yate's correction)

Table 4 Duration of labor (min) in the vaginal deliveries (N=3060)

Duration of labor	1 st stage (min)	2 nd stage (min)
5 th percentile	75	3
median	260	13
95 th percentile	720	58
99 th percentile	1070	119
1 st stage>20 h, n	17 (0.6%)	–
2 nd stage>3 h, n	–	10 (0.3%)

Discussion

Ford et al. reported that, based on its definition, the primary cesarean section rate among parous women in the United States was 7.1%, 6.6%, and 9.3% in 1990, 1996, and 2003, respectively.³ Boyle et al. reported that the primary cesarean section rate among the multipara was 11.5% (10,368/89,868)¹¹ using the data from the Consortium on Safe Labor between 2002 and 2008. Reports from India showed that the primary cesarean section rate ranged from 1.8%⁵ to 10.3%⁷. A university hospital in Pakistan showed a very high primary cesarean section rate (37.2%) in multiparous women.¹⁰ Our study showed a much lower cesarean section rate than those reports, probably because our clinic admitted only women with low-risk pregnancies and high-risk pregnant women were referred to tertiary care hospitals before term.

The leading indications for primary cesarean section in multiparous women were fetal malpresentation,^{5–7,11} fetal distress^{2,4,8,9,12} and cephalopelvic disproportion.¹⁰ Boyle et al. showed that many cesarean sections were performed because of failure to progress or cephalopelvic disproportion in multiparous women within 2 hours of the 2nd stage of labor, and only 1.1% of these women were given a trial of operative vaginal delivery.¹¹ They claimed that cesarean sections could be avoided if adequate time was allowed for progression of labor and operative vaginal delivery was attempted. In our study, the duration of labor was similar to that reported by Albers in 1999.¹³ According to this study, the mean duration of 1st and 2nd stages of labor among multiparous women was 5.6 h and 18 min, respectively. The upper limit (mean+2SD) for the 1st and 2nd stages of labor was 13.8 h and 64 min, respectively. These figures corresponded to approximately the 95th percentile in our study (Table 4). Some deliveries took a much

longer time, and the 99th percentile for the 1st and 2nd stages of labor was 1070 min and 116 min, respectively. This was four and nine times longer than the median duration of the 1st and 2nd stages of labor, respectively (Table 4). The cause for the low cesarean section rate in this study could have been the adequate time allowed for delivery.¹

Vacuum extraction was performed in 61 out of 3,094 cases (2.0%) in this study. Vacuum extraction rates in the US were reportedly comparable at 2.5% in 2018.¹⁴ Without operative vaginal deliveries, the primary cesarean section among multiparas would be more frequent, but the skill of operative vaginal deliveries is now fading.¹⁵

One woman who had previously undergone myomectomy after the first vaginal delivery underwent a cesarean section in her subsequent pregnancy. Vaginal delivery after myomectomy is not a contraindication,¹⁶ but she chose a planned cesarean section after providing informed consent. In our clinic, vaginal delivery is offered to parous women with a breech presentation if their previous pregnancy had normal progression of labor.¹⁷ Eleven out of 39 women with breech presentation chose vaginal delivery and had successful deliveries. As the occurrence of malpresentations, including breech presentation, was infrequent, the cesarean section rate would not rise substantially even if all the malpresenting babies be born by cesarean section. Levine et al. reported that induction of labor increased the cesarean section rate regardless of parity.¹⁸ However, our results showed no effect of induction on the cesarean section rate (Table 3).

This study had some limitations. First, women with high-risk pregnancies were excluded. Therefore, the precise primary cesarean section rate for all the multipara could not be estimated. Second, the multiparous women with previous histories of difficult vaginal delivery might not have chosen our clinic. Therefore, there could have been unintentional bias in including only those with relatively easier vaginal deliveries. Resulting in a low primary cesarean section rate among the multipara in our study. However, our previous study revealed that even multiparous women with a long and difficult labor in their first pregnancy underwent a normal vaginal delivery in subsequent pregnancies.¹⁹

This study also has some strengths. This study was conducted at a single clinic, and the decision to perform a cesarean section was made by a single doctor. As the cesarean section rates can vary among hospitals and physicians,^{20,21} this study avoided such inter-hospital and inter-physician variations in the analysis of cesarean section rates. The management of parturition and nurse- and midwife-led care, both of which could affect the cesarean section rates,²²⁻²⁴ remained unchanged during the study period.

Very low cesarean section rate was shown among low-risk multiparous women in this study. However, malpractice litigation pressure and fear have a considerable influence on the obstetrical practice and the rate of cesarean section.^{25,26} Therefore, what was shown in this study would not apply in different medical-legal circumstances.

Conclusion

In low-risk settings, multiparous women with cephalic presentations, with a history of previous vaginal delivery, without a uterine scar, had a very low incidence of cesarean section. The most common indication for primary cesarean section in the multipara was breech presentation. Skillful operative vaginal delivery and allowing adequate time to achieve vaginal delivery may contribute to a low cesarean section rate.

Data availability

The date used in this study is available upon request.

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Conflicts of interest

The author declares that there is no conflict of interest regarding this study.

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