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Delivery route preferences of urban women of low socioeconomic status*

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Abstract

Objective—To identify the main determinants of mode of delivery preference among urban dwelling women of lower socioeconomic status (SES).

Methods—Over a 12-month period, a self-completion 36-item questionnaire was administered to a convenience sample of 308 women within the first 3 postpartum days. Non-parametric tests were used for analysis.

Results—Study participants were mostly African American (>85%), single mothers (>75%), and unemployed (≥55%). Among the women, 85.7% had vaginal delivery (VD) and 14.3% had cesarean delivery (CD). Women who preferred CD (10%) were more likely to be concerned about a vaginal tear/episiotomy during VD, forceps, and a "big" baby compared with women who preferred VD, for whom "pushing the baby out myself" and "fear of cesarean" were the most important factors. In the final model of 7 factors, the 3 main factors found to positively impact maternal preference for CD were a vaginal cut during VD ($P<0.001$), higher mean BMI ($P=0.001$), and cesarean as the most recent delivery type ($P<0.001$). The total explained variance by this model was 46%.

Conclusions—Short-term complications of a VD, higher BMI, and a previous cesarean delivery are the most significant factors that impact the preferences of women of lower SES for future mode of delivery.

Keywords

Cesarean delivery; Delivery route preference; Lower socioeconomic status; Vaginal delivery

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Conflict of interest

The authors have no conflicts of interest.

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1. Introduction

Over the past 5 years, the rate of elective primary cesarean delivery (CD) in the USA has risen to as high as 7 per 100 deliveries [1,2]. This trend contributes to the increase in overall CD rate and may be physician and/or patient-driven.

Cesarean delivery on maternal request evokes considerable controversy in the literature, media, and on the part of the mothers and physicians, by bringing the balance between the patient's right to autonomy and a physician's responsibility of non-maleficence/beneficence to the center of the debate. Some studies have suggested that, compared with VD, there are potential protective benefits of CD to the mother with respect to stretching, tearing, and even avulsion of the connective tissue, muscular support, and innervation of the pelvic floor during parturition [3,4]. Although the safety of CD has improved in the last 30 years, with advances in pharmacotherapy to prevent endometritis, to alleviate labor pains, and with prophylaxis against thromboembolic events, this mode of delivery is still not without risks for the mother and fetus. The need for a subsequent CD is one of the most important risks of an elective cesarean delivery (ECD). A repeat CD carries significantly more risk in terms of abnormal placentation, injury to internal organs during surgery, excessive blood loss, uterine rupture, need for hysterectomy, and maternal death [5,6]. Additionally, risks to the fetus range from lacerations to respiratory distress syndrome of the newborn. From the neonatal perspective, the estimated number needed to treat with ECD to avoid one "poor neonatal outcome" is 1591 [7]. Although the financial impact of these complications may be small for the individual patient, the costs multiplied over a large population will be great as more and more cesareans are performed [8].

A body of literature on practitioners' attitudes toward ECD indicates that a significant proportion of obstetricians are willing to proceed with this mode of delivery if requested [9]. While the majority of studies examine maternal attitudes toward ECD of women who are insured or of higher social and economic status [10–13], there is a paucity of literature on maternal attitudes toward preferred delivery route among women of lower socioeconomic status (SES) [14]. Taking into account that these women come from a disadvantaged background, it is unclear if they have the same choice or the same autonomy to choose elective CD. The aim of the present study was to identify the main determinants of mode of delivery preference among urban dwelling women of lower socioeconomic status (SES).

2. Materials and methods

After Institutional Review Board approval at Wayne State University, women who delivered a live-born singleton infant at Hutzel Hospital, Detroit, MI, USA, a tertiary care teaching institution, were recruited from the postpartum and labor and delivery recovery/postpartum units. Women with multiple gestations, perinatal death, psychiatric disorders, or who were unable to speak or read English were excluded from participation. Over the 12-month study period between March 1, 2006 and April 30, 2007, 394 eligible patients were approached to participate in the study within their first 3 postpartum days. A convenience sample of 308 women was used. After obtaining patient consent to participate in the study, our research staff administered and was available to help with a 36-item self-completion postpartum questionnaire examining women's preferences on the mode of delivery.

The questionnaire was designed based on the categories of importance to the delivering mothers ascertained from the most recent literature on maternal attitudes toward CD and vaginal birth [10–12,15–18]. It included 36 items across 5 domains: patient views on the delivery mode (12 items); patient sense of control during delivery (5 items); short- and long-

term complications associated with vaginal and CD (11 items); sexual function (3 items); and the role of the delivering physician and family and friends' opinions on the route of delivery (5 items). A list of potential VD or CD complications was included in the questionnaire. With the exception of 4 items, the majority of the questions were ranked on a 6-point Likert-type scale (0–5 ranging from 0 “not important”, to 5 “important”), measuring the level of importance given by the patient to each issue.

To evaluate internal consistency of measurement across the questionnaire, we calculated the Cronbach α . The total scale Cronbach α (without the 4 non-Likert-type scale items) was high ($\alpha = 0.76$), with individual item correlations within domains ranging from 0.48 to 0.76.

Additionally, we collected data on maternal age, ethnicity, BMI at the time of hospitalization, parity, level of education, marital status, cesarean indications, gestational age, neonatal birth weight, and delivery mode.

The study was designed to detect a 1-point difference in the mean Likert-type scale scores (standard deviation = 1.4) between women who “preferred VD” and those who “preferred CD.” Using an independent samples *t* test, the final sample size of 100 ($n=72$, Mann-Whitney *U* test) provided 80% power at $\alpha = 0.05$ (2-sided). Furthermore, when the actual observed difference of 0.9 in the mean Likert-type scale scores between the two groups was used, the calculated sample size was increased to 154 (80% power) and 308 (98% power), using an independent samples *t* test, and to 72 (80% power), using a Mann-Whitney *U* Test.

Statistical analyses were performed using descriptive statistics, summary measures, X^2 test, *t* test, and Mann-Whitney *U* test for non-parametric data. Variables found to be statistically significant ($P<0.1$) from the latter analyses were used for multiple linear regression modeling. The outcome measure was the patient's answer to Question 1, inquiring about the future preferred route of delivery (VD versus CD). We dichotomized the scores to this question into two categories with a split at 2.5 on the Likert-type scale, yielding those who “preferred to have a vaginal delivery” and those who “preferred to have cesarean delivery.”

3. Results

Of 394 eligible women, 308 women agreed to participate in the study, for a response rate of 78.2%. The 86 patients who refused to participate were not statistically significantly different in demographic characteristics from the responders. A total of 264 (85.7%) women delivered vaginally and 44 (14.3%) had a CD. The vast majority of women were of African American descent, multiparous, and single mothers. Among participants, 55.2% were not employed. In this convenience sample only 35 (11.4%) women desired to have a CD in future: 23 (8.7%) women who had a VD compared with 12 (27.3%) women who had a CD; this was based on their response to the question “If you had a choice, which type of delivery would you want to have in future?” When comparing the demographic and obstetric characteristics of those women who desired to have a CD in future with those who desired to have a VD in future, women preferring a CD had lower parity ($P=0.04$), a higher mean BMI ($P=0.001$), and tended to have undergone CD as the most recent delivery type ($P=0.001$) (Table 1).

Table 2 presents the results of univariate analysis of the 36-item questionnaire comparing the women who desired a future CD with those who desired a future VD. The analysis revealed that women who desired a CD were more concerned about having an instrumental delivery, pain management at the time of delivery, having a cut/episiotomy during VD, delivering a large baby, and having shoulder dystocia during VD. On the other hand, those that desired VD were influenced by their physician's explanation of the suggested route of delivery, valued the importance of “pushing the baby out myself,” and feared surgery. Of

interest, patients answered that they would have preferred to have a cesarean if they had had shoulder dystocia or a vaginal cut during the most recent vaginal delivery, or if they experienced problems with unintentional loss of gas or feces after the most recent vaginal delivery. Variables that were found to be at least borderline statistically significant ($P < 0.1$) on X^2 test, t test, and non-parametric data analyses were included in multiple linear regression modeling (Table 3). Seven factors were found to significantly impact women's preferences for CD: having had a cesarean with the most recent delivery; a history of CD; being obese; a vaginal cut during any VD; being less afraid of CD; having a large baby; and experiencing problems with unintentional loss of gas or feces after recent delivery. In particular, having had a cesarean with the most recent delivery ($R^2 = 6\%$), having a BMI over 30 ($R^2 = 7\%$), and having had a vaginal cut during any VD ($R^2 = 22\%$) were the major identifiable reasons why these women would prefer to have a CD, which explained nearly half of the variance within delivery preferences. Of note, there were 7 episiotomies with 1 extension to a third-degree perineal laceration, 3 third-degree perineal lacerations, and no fourth-degree perineal lacerations. The remainder of the lacerations were either first-degree perineal ($n=31$), second-degree perineal ($n=21$), vaginal sulcal ($n=11$), or periurethral ($n=25$). We attempted to evaluate the impact of having had an episiotomy or vaginal tear in addition to an episiotomy/cut by forcing this factor into multiple linear regression analysis. This factor was not found to be significant.

4. Discussion

This cross-sectional study suggests that only a minority of women from a lower socioeconomic background would prefer an elective cesarean delivery. Furthermore, for those women who prefer CD, delivery preferences are significantly impacted by their experiences at the time of their previous delivery and by potential short- and long-term maternal complications of a vaginal delivery. In fact, fear of a vaginal cut, a higher BMI, history of having CD, fear of having a large baby, and potential problems with loss of gas or feces after VD were statistically significant determinants among women who preferred CD. These findings account for a remarkably high proportion of the variance (46%) explaining why one mode of delivery is preferred over the other, either CD over VD or vice versa.

While the majority of available literature on maternal attitudes toward mode of delivery evaluates attitudes of women who are insured or of higher social status [10–13], few studies have looked at a sample of non-white women of lower SES [14]. Previous studies have suggested that few women want a CD without any clinical reason. In fact, studies from the USA, South America, Europe, and Asia, among others [10–13,15], have shown that the majority of women want a vaginal birth but fear the pain associated with VD. Signorello et al. [16] found perineal trauma and/or the use of obstetric instrumentation were correlates of the rate or severity of postpartum dyspareunia. Furthermore, in a large prospective multicenter Childbirth and Pelvic Symptoms study, first-time mothers whose delivery was complicated by an anal sphincter laceration were less likely to be sexually active at 6 months postpartum [17]. However, despite a strong overall trend toward vaginal birth, in Brazil over 31% of women have a cesarean; it is unknown, however, whether this is patient- or physician-driven [10,13]. Similar to the findings of our study, women who have had a previous CD are more likely to choose CD in future [14,18]. From the present study, it appears that women's attitudes toward the mode of delivery are, in part, a reflection of their positive or negative experiences. Likewise, potential explanations for wanting a CD have included sense of control or psychological reasons, perception of reduced risk and/or pain, and belief that a cesarean is an easier way to give birth. Surprisingly, in our study, risks to the baby were not a determining factor in deciding on the desired mode of delivery.

Studies that evaluate the effect of racial/ethnic differences on delivery preferences are few in number and of small sample size. One study of 93 women who had a cesarean birth revealed that, in general, white women (n=46), compared with minority women (n=47), are twice as likely to have higher education levels and attend childbirth classes during their first pregnancy ($P<0.0001$) [19]. Taking into account that first-time mothers considered books as their main source of information about childbearing [20], it would not be surprising to find that low SES women are less likely to read books and more likely to get their information on pregnancy and delivery from TV shows. Potentially, differences in medical knowledge due to an overall lower educational level might account for some differences in the choice of delivery route. Additionally, ethnic minority women view labor as a “painful necessary evil” that does not relate to one’s intrinsic worth [19]. Forty-seven percent of minority women do not want to have a vaginal birth after CD compared with 22% of white women, who view VD as a “once-in-a-lifetime experience not to be missed” and a “challenge they had to conquer” in order to enter motherhood. However, another study found that a better educated group of patients did not appear to be more interested in or more likely to choose vaginal birth after CD [21]. In our study, the participants were primarily of African American descent (>85%), single mothers (>75%), unemployed ($\geq 55\%$), and had completed high school or less (around 70%) with a compromised social support system, although we did not compare them to a higher SES group. Only 11% of the women preferred to have an ECD in future, given the choice. Potential reasons might have included longer hospitalization and recovery, with the vast majority potentially thinking that undergoing an ECD would result in a delay in being able to take care of their families and children. Furthermore, ECD might not have been a “real” possibility for them. The word “elective” implies an element of choice; it is “choice experienced within externally imposed limitations, which restricts its utility for poor mothers” [22]. In other words, this may be a choice that they, because of their economic status, are not really given, or that is not available to them as a group.

The strengths of the present study include its fairly large sample size. Despite the need for further external validation, the designed instrument has high internal consistency of measurement as evident from the high Cronbach α . The factors identified explain a surprisingly high 46% of the variance in maternal preferences for the mode of delivery in a lower socioeconomic segment of the society. However, the study also has several limitations. First, the data were collected from a convenience sample with attendant biases. For instance, selection bias can be inferred from a low CD rate in this convenience sample compared to an overall higher CD rate at Hutzell Hospital. Thus, there might have been a reduction in the number of women preferring CD in our study. Second, we had a large number of multiparous women, whose views on the route of delivery might have been impacted by their previous experiences and might not reflect the views of nulliparous women. Additionally, we used a non-validated questionnaire to evaluate delivery route preferences since there is no relevant validated questionnaire available. Finally, our chosen timing of data collection might have skewed the results of the study. Some studies have found that women tend to post-hoc rationalize what has happened to them during delivery [18,23]. They are less likely to be critical of their route of delivery and their participation in decision making when questioned in the early postpartum period.

This study explores maternal attitude toward mode of delivery in a unique segment of the population that may have considerable everyday concerns for their family’s well-being. These mothers are frequently the sole source of support for their family. A recent Committee Opinion on Cesarean Delivery on Maternal Request from the American College of Obstetrics and Gynecology (ACOG) advises an obstetrician to counsel a patient regarding mode of delivery based not only on “age, body mass index, accuracy of estimated gestational age, reproductive plans”, but also “personal values, and cultural context” [24].

We believe additional studies are needed to evaluate women's preferences for mode of delivery in various cultural and socioeconomic settings.

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Table 1Demographic and obstetric characteristics of the study group (n=308)^a

Characteristics	Preferred method of future delivery		P value
	Vaginal deliveries (n=273)	Cesarean deliveries (n=35)	
Age at delivery, y	24.5 ± 5.1	24.4 ± 5.6	0.07
Parity			0.04
Primiparity	18 (6.6)	6 (17.1)	
Multiparity (>1)	255 (93.4)	29 (82.9)	
BMI	32.4 ± 9.7	38.3 ± 7.9	0.001
Ethnicity			0.62
White	28 (10.3)	3 (8.6)	
African American	233 (85.3)	32 (91.4)	
Other	12 (4.4)	0 (0)	
Marital status			0.83
Single	214 (78.4)	26 (74.3)	
Married	54 (19.8)	8 (22.9)	
Divorced	5 (1.8)	1 (2.9)	
Educational status			0.29
Elementary school	26 (9.5)	4 (11.4)	
High school	146 (53.5)	21 (60.0)	
Post-secondary education	101 (37.0)	10 (28.6)	
Employment status			0.43
Not employed	149 (54.6)	21 (60.0)	
Salaried	94 (34.4)	11 (31.4)	
Self-employed	30 (11.0)	3 (8.6)	
Gestational age, wk	38.4 ± 2.4	38.3 ± 2.3	0.84
Birth weight, g	3095 ± 624	3206 ± 525	0.31
Recent method of delivery			0.001
Vaginal delivery	241 (88.3)	23 (65.7)	
Cesarean delivery	32 (11.7)	12 (34.3)	
Labor			<0.001
Spontaneous	208 (76.2)	12 (34.3)	
Induced	55 (20.1)	8 (22.9)	
Unknown	10 (3.7)	15 (42.9)	
Anesthesia			<0.001
General	0 (0)	4 (11.4)	

Characteristics	Preferred method of future delivery		P value
	Vaginal deliveries (n=273)	Cesarean deliveries (n=35)	
Regional	194 (71.1)	31 (88.6)	
Local	79 (28.9)	0 (0)	
Midline episiotomy	6 (2.2)	1 (2.9)	0.58

^aValues are given as mean $\pm$ SD or number (percentage).

Table 2Results of univariate analysis of the questionnaire^a

Questions	Mean score on a 6-point Likert-type scale for preferred method of future delivery		<i>P</i> value ^b
	Vaginal delivery	Cesarean delivery	
<i>Factors “For” CD</i>			
Concern about vacuum delivery	3.9 ± 1.4	4.4 ± 0.9	0.07
Concern about having forceps	3.8 ± 1.4	4.6 ± 0.8	0.002
Concern about risks of VD	2.9 ± 1.4	4.1 ± 1.1	0.08
Concern about labor pains	3.7 ± 1.5	4.1 ± 1.2	0.09
Concern about a vaginal tear during VD	3.4 ± 1.4	4.3 ± 1.1	<0.001
Concern about a cut/episiotomy during VD	3.4 ± 1.5	3.9 ± 1.3	0.05
Baby is equal to or larger than 9 pounds	2.9 ± 1.7	4.6 ± 1.0	<0.001
Enjoy sexual intercourse more with CD rather than VD	2.5 ± 1.1	3.1 ± 1.1	0.002
Desire to have CD if shoulder dystocia had been present in recent delivery	2.0 ± 1.4	3.5 ± 1.3	<0.001
Desire to have CD with next delivery if a big cut had been done during recent VD	1.8 ± 1.4	3.6 ± 1.4	<0.001
Desire to have CD with next delivery if problems with unintentional loss of gas or feces occurred after VD	1.9 ± 1.3	3.1 ± 1.4	<0.001
Having enough information to make a decision on the type of delivery to have (VD vs CD)	1.8 ± 2.1	2.4 ± 1.6	0.03
<i>Factors “Against” CD</i>			
Role of doctor’s explanation in the patient’s choice of the mode of delivery	4.7 ± 0.8	4.4 ± 1.1	0.07
Importance of pushing the baby out myself	4.4 ± 1.1	3.2 ± 1.6	<0.001
Fear of a surgery (CD)	3.9 ± 1.4	2.8 ± 1.8	<0.001

Abbreviations: VD, vaginal delivery; CD, cesarean delivery.

^aValues are given as mean ± SD.^bUnivariate analysis was performed using Mann-Whitney *U* test. All factors with *P* < 0.1 and that were subsequently entered into multiple linear regression analysis are presented.

Table 3

Multiple linear regression models for preference of mode of delivery

Variable	Adjusted R^2 change	F change	Significance of F change
Cut during VD	22%	79.4	<0.001
Mean BMI > 30	7%	19.4	0.001
Recent delivery type	6%	19.8	<0.001
Fear of CD	5%	15.2	<0.001
Having a baby equal or larger than 9 pounds	4%	11.5	0.001
History of previous CD	1%	4.9	0.03
Having problems with unintentional loss of gas or feces after recent delivery	1%	5.9	0.02
Total R^2	46%		

Abbreviations: VD, vaginal delivery; CD, cesarean delivery; Adjusted R (adjusted for the number of explanatory variables in the model); F, F statistic.