ORIGINAL RESEARCH

Sociodemographic Factors Influencing Choice of the Mode of Delivery in Pregnant Women – A Cross-sectional Study from Tertiary Hospital in Srinagar, India

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Received on: 06 June 2023; *Accepted on*: 17 August 2023; *Published on*: xx xx xxxx

Abstract

Background: Cesarean delivery (CD) rates in India (21.5%) and in Jammu and Kashmir (41.7%), in particular, are way above the World Health Organization (WHO) accepted threshold of 10–15%. The study aimed to recognize the sociodemographic components associated with preference for the mode of delivery. These may form the target for future intervention.

Methodology: This was a cross-sectional, hospital-based study to examine the sociodemographic factors influencing expecting mother's choice of delivery: Cesarean delivery or vaginal delivery (VD). Gravid women attending antenatal clinics were interviewed using a structured questionnaire, and data were analyzed.

Results: Between August 2017 and July 2019, 1000 pregnant women participated in the study. Among them, 561 (56.1%) preferred CD. Univariate analysis revealed that patients with increasing age (30–34: OR: 1.61, *p*-value = 0.001; 35–39: OR: 1.94, *p*-value < 0.001) preferred CD over VD. Participants residing in urban areas (OR: 1.93, *p*-value < 0.001) and multigravid women (OR: 1.71, *p*-value < 0.001) preferred CD. Participants who had undergone both lower segment caesarean section (LSCS) and VD in the past and those who received information from healthcare professionals (OR: 0.17, 95% confidence interval (CI): 0.09–0.28, *p*-value < 0.001) did not choose CD. Multivariate analysis revealed that urban residency adjusted odds ratio (AOR): 1.73, *p*-value = 0.001), multigravid women AOR: 1.56, *p*-value = 0.009) preferred CD whereas patients who received information from a healthcare professional (AOR: 0.15, 95% CI: 0.09–0.27, *p*-value < 0.001) did not choose CD.

Conclusion: More than half of the women preferred CD as a mode of delivery, which is a matter of concern for both health authorities and society. The findings of this study help us better understand the variables affecting childbearing women's decisions regarding the technique of delivery. This study also emphasizes the important role that medical personnel plays in educating patients and their partners about the advantages and process of normal vaginal birth.

Keywords: Cesarean delivery, Mode of delivery, Preference, Vaginal delivery.

Journal of South Asian Federation of Obstetrics and Gynaecology (2023): 10.5005/jp-journals-10006-2360

Introduction

Childbirth is a critical event that can have long-lasting implications for the health and well-being of the mother and new-born baby. The mode of delivery, whether vaginal delivery (VD) or cesarean delivery (CD), is an essential consideration for pregnant women and their healthcare providers. Lately, there has been a growing concern about the increasing rates of CD worldwide, particularly among women with no medical indications. Cesarean section rates have been reported to be as high as 50% in some countries, far above the recommended threshold of 10–15% by the World Health Organization (WHO).[1] The highest CD rates are reported from Latin America and the Caribbean region (40.5%), followed by Northern America (32.3%).[2] The prevalence of CD is epidemic globally and in India. The data from the National Family Health Survey (NFHS) highlight the changing trends in CD rates in India.[3] C-section births in India increased by 4.3 percentage points over the five years to 21.5% (NFHS-5). Nearly half the total cesarean births (49.3%) occurred at private health facilities in urban areas; in rural areas, the figure was 46%. In the past 5 years, Telangana had the highest percentage (44.5%) of deliveries performed *via* C-Section at public health facilities, followed by Jammu and Kashmir (42.7%) and Ladakh (39.3%). Jammu and Kashmir, as a Union Territory, reported that 82.1% of C-section births occurred in private institutions.[4]

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How to cite this article: Wani IR, Sultana S, Waris M, *et al*. Sociodemographic Factors Influencing Choice of the Mode of Delivery in Pregnant Women – A Cross-sectional Study from Tertiary Hospital in Srinagar, India. J South Asian Feder Obst Gynae 2023;x(x):xx–xx.

Source of support: Nil

Conflict of interest: None

The mode of delivery that pregnant women choose to use is influenced by a number of factors, including medical indications such as fetal distress, breech presentation, and previous cesarean section. However, sociodemographic factors, including age, education level, income, and ethnicity, may also play a pivotal role in decision-making.

Understanding the sociodemographic factors that exert influence on the choice of mode of delivery is essential for healthcare providers and policymakers in providing appropriate maternal care services. It can help identify groups of women likely to choose cesarean section deliveries and develop targeted interventions to promote VD where medically appropriate. Furthermore, addressing sociodemographic disparities in access to maternal healthcare services and information may help reduce the overall cesarean section rates and improve maternal and child health outcomes.

The aim of this study was to identify the sociodemographic factors that influence the choice of mode of delivery among pregnant women – CD or VD. This information will enable us to comprehend how decisions are made.

Methodology

General Study Design

This descriptive cross-sectional, hospital-based study was done between August 2017 and July 2019. The study was conducted in the outpatient setting of the Department of Obstetrics and Gynaecology in a tertiary care hospital in Srinagar, Jammu and Kashmir. The study was conducted after approval from the Institute's Ethics Committee. We chose the participants for the study using a practical sampling method based on their willingness to participate. written informed consent was obtained from all the participants. The declaration of Helsinki and the criteria for good clinical practice were followed during the study's execution.

Participants

Pregnant women visiting the antenatal clinic who were either primigravida, previous lower segment caesarean section (LSCS), previous VD, or previous LSCS and VD were included. Women with a history of two LSCS, critically ill women, who conceived after infertility treatment, and women who didn't consent were excluded from this study.

Measures

During antenatal care, pregnant women were given a structured, self-administered questionnaire. The questionnaire included questions about their sociodemographic information their preferred method of delivery and the factors that exerted influence on their decision making. The questionnaire was designed using information from previous studies that explored attitudes, practices of pregnant women, and contributing factors towards vaginal and cesarean deliveries. At the antenatal clinic, pregnant patients were given a questionnaire to fill out. For women who were unable to read, the researcher read the questions aloud and selected their responses accordingly.

Statistical Analysis

The statistical analysis was performed using Stata version 14.0 (StataCorp. 2015. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP.). A prior sample size calculation was not done. Continuous variables were represented as mean and standard deviation and categorical variables were expressed as frequency and percentage. The *t*-test and Chi-square test were used to study the association between preference for the mode of delivery and continuous and categorical variables, respectively.

Table 1: Baseline characteristics

Variables	*Frequency*	*Percentage (%)*
Age		
Mean ± SD	30.31 ± 3.69	
24–29	468	46.80
30–34	371	37.10
35–39	161	16.10
Education		
Illiterate	184	18.40
Primary and middle	356	35.60
Secondary and graduation	460	46.00
Residency		
Rural	729	72.90
Urban	271	27.10
Socioeconomic status		
Lower	314	31.40
Middle	441	44.10
Upper	24.5	24.50
Previous delivery		
Primi	363	36.30
NVD	97	9.70
LSCS	476	47.60
LSCS and NVD	64	6.40
Source of information		
Others	120	12.00
Health care professionals	880	88.00
Preference		
NVD	439	43.90
LSCS	561	56.10

LSCS, lower segment caesarean section; NVD, normal vaginal delivery

To further investigate the strength of the association, logistic regression was performed. The results were represented as an unadjusted odds ratio (UOR) with a 95% confidence interval (CI). For multivariate analysis by complex logistic regression, variables with p-value < 0.25 in univariate analysis were chosen. The results were represented as an adjusted odds ratio (AOR) with 95% CI. Statistical significance was taken at 5%.

Results

A total of 1,000 women gave consent to participate in the study and completed the questionnaire. Table 1 describes the baseline characteristics of the study participants. Among the 1,000 patients, 468 (46.8%) were between 24 and 29 years, 371 (37.1%) were between 30 and 34 years and 161 (16.1%) were between 35 and 39 years age group, and most were educated up to secondary level or graduation (46.0%). The majority of the patients were from rural areas (72.9%), and most belonged to middle socioeconomic status (44.1%), followed by lower socioeconomic status (31.4%). Nearly one-half (47.6%) had previous LSCS, and 36.3% were primigravida. The source of information regarding safety and risks of the mode

Table 2: Association with factors

Variables	*Prefers NVD*	*Prefers LSCS*	*p-value*
Age			
Mean ± SD	29.65 ± 3.62	30.82 ± 3.68	<0.001
24–29	238 (50.85)	230 (49.15)	<0.001
30–34	145 (39.08)	226 (60.92)	
35–39	56 (34.78)	105 (65.22)	
Education			
Illiterate	80 (43.48)	104 (56.52)	0.253
Primary and middle	145 (40.73)	211 (59.27)	
Secondary and graduation	214 (46.52)	246 (53.48)	
Residency			
Rural	351 (48.15)	378 (51.85)	<0.001
Urban	88 (32.47)	183 (67.53)	
Socioeconomic status			
Lower	125 (39.81)	189 (60.19)	0.190
Middle	199 (45.12)	242 (54.88)	
Upper	115 (46.94)	130 (53.06)	
Gravida			
Primi	190 (52.34)	173 (47.66)	<0.001
Multigravida	249 (39.09)	388 (60.91)	
Previous delivery ($n = 637$)			
NVD	32 (32.99)	65 (67.01)	0.094
LSCS	185 (38.87)	291 (61.13)	
LSCS and NVD	32 (50.00)	32 (50.00)	
Source of information			
Others	16 (13.33)	104 (86.67)	<0.001
Health care professionals	423 (48.07)	457 (51.93)	

LSCS, lower segment caesarean section; NVD, normal vaginal delivery

Table 3: Logistic regression analysis result

Unadjusted OR (95% CI)	*p-value*	*Adjusted OR (95% CI)*	*p-value*
1 (reference)		1 (reference)	
1.61 (1.22–2.13)	**0.001**	1.13 (0.81–1.58)	0.459
1.94 (1.34–2.81)	**<0.001**	1.19 (0.76–1.86)	0.436
1 (reference)		-	
1.12 (0.78–1.60)	0.539	-	
0.88 (0.63–1.25)	0.484	-	
1 (reference)		1 (reference)	
1.93 (1.44–2.59)	**<0.001**	1.73 (1.25–2.39)	**0.001**
1 (reference)		1 (reference)	
0.80 (0.59–1.08)	0.146	0.81 (0.59–1.12)	0.216
0.75 (0.53–1.05)	0.091	0.77 (0.53–1.10)	0.151
1 (reference)		1 (reference)	
1.71 (1.32–2.22)		1.56 (1.11–2.17)	**0.009**
1 (reference)		–	
0.77 (0.49–1.23)	0.278	–	
0.49 (0.26–0.94)	**0.032**	–	
1 (reference)		1 (reference)	
0.17 (0.09–0.28)	**<0.001**	0.16 (0.09–0.27)	**<0.001**

Bold values indicates statistically significant on a predetermined set value of significance of <0.05

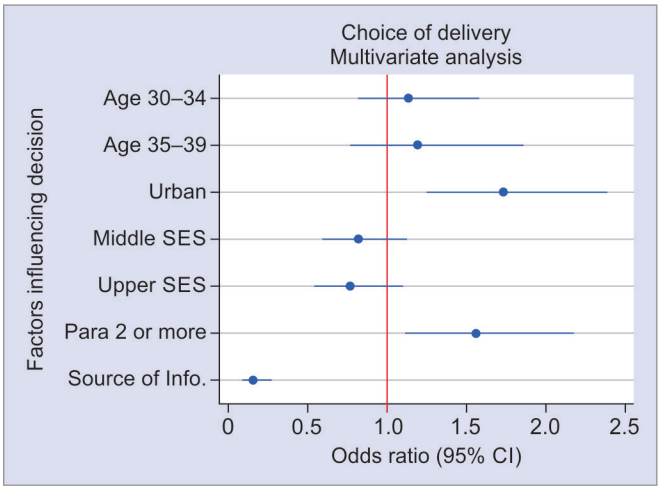

Fig. 1: Forrest plot depicting the result of multivariate regression analysis
Info, information; Para, parity; SES, socioeconomic status

of delivery was healthcare personnel in 88.0% of patients. On enquiring regarding the preference of delivery, 56.1% said they preferred an LSCS.

The bivariate analysis reporting the association between preference for mode of delivery and various sociodemographic factors is reported in Table 2. Age category (p-value < 0.001), residency (urban vs rural, p-value < 0.001), gravidity (primi vs multi) (p-value < 0.001), and source of information (p-value < 0.001) were significantly associated with preference for mode of delivery.

Simple logistic regression (Table 3) revealed that patients with increasing age (30–34 - OR: 1.61, 95% CI: 1.22–2.13, p-value = 0.001; 35–39 - OR: 1.94, 95% CI: 1.34–2.81, p-value < 0.001) preferred LSCS over normal vaginal delivery. Participants residing in urban areas (OR: 1.93, 95% CI: 1.44–2.59, p-value < 0.001), and patients who were multigravida (OR: 1.71, 95% CI: 1.32–2.22, p-value < 0.001) had more likelihood of choosing LSCS. Participants who received information from healthcare professionals (OR: 0.17, 95% CI: 0.09–0.28, p-value < 0.001) and patients with a history of both NVD and LSCS (OR: 0.49; 95% CI: 0.26–0.94, p-value 0.032) had less likelihood of choosing LSCS.

Further, complex logistic regression (Table 3) found that urban residency (AOR: 1.73, 95% CI: 1.25–2.39, p-value = 0.001), patients who were multigravida (AOR: 1.56, 95% CI: 1.11–2.17, p-value = 0.009) were more likely to prefer LSCS whereas patients who received information from a healthcare professional (AOR: 0.15, 95% CI: 0.09–0.27, p-value < 0.001) were less likely to choose LSCS (Fig. 1).

Discussion

Our study revealed that place of habitat, parity, and source information are factors significantly influencing the choice of mode of delivery in pregnant women. On enquiring regarding the preference of delivery, a staggering 56.1% said they preferred an LSCS. In 2010, Saoji et al. from Nagpur found that 91.5% of the

participants in their study favored VD. They concluded that these results offer compelling evidence that patient preference for a mode of delivery is not likely to be the primary reason causing the rising CS rate.[5] According to Saxena et al., 30% of women favored CD, while 70% of women preferred VD. Similar statistics from CMC, Ludhiana, and Punjab were also published by Varghese et al. in 2016.[6] These numbers might indicate a shifting preference for CS among patients.

Sociodemographic Factors Influencing Women's Choice of Mode of Delivery

Age

In our study, bivariate analysis revealed that age category was significantly associated with the preference of a mode of delivery (p-value < 0.001), and Simple logistic regression revealed that patients with increasing age (30–34- OR: 1.61, 95% CI: 1.22–2.13, p-value = 0.001; 35–39 - OR: 1.94, 95% CI: 1.34–2.81, p-value < 0.001) preferred LSCS over VD. Similar findings were reported by Yilmaz et al., which showed that women 30 years or more preferred CD.[7] According to Karna, women under the age of 25 had much greater rates of CD than those who gave birth at younger ages.[8] Kamal from Bangladesh added that women between the ages of 19 and 34 had a higher CD rate than younger ones.[9] However, Saxena et al. reported that the young and older women had no specific preference for VD or CD.[10] Similar results were reported by Saoji et al. from Nagpur.[5]

Place of Habitat

In our study, residence (rural vs urban) was significantly associated with the preference for a mode of delivery (p-value < 0.001). Complex logistic regression found that patients with urban residency (AOR: 1.73, 95% CI: 1.24–2.42, p-value = 0.001) were likelier to prefer LSCS. Previous studies have shown rural pregnant women to choose home deliveries, but women attending Tertiary Care Centers have not shown any specific preference based on residency.[10]

Economic Status

Our population's financial situation had no bearing on how they desired to receive their care. Similar results were also reported by Varghese et al. from Punjab and Dogra and Sharma from Himachal Pradesh, India.[6,11] Similar findings were reported by Saxena et al. from Bangalore.[10] However, Zewude et al. from Ethiopia reported that the choice of mode of delivery was significantly associated with self-reported economic status in their population.[12]

Educational Status

In our study, the educational status was not statistically significant with the preference of a mode of delivery. Saoji et al. also reported no difference in educational status between women who desired Caesarean versus women who preferred VD.[5] However, Varghese et al. and Saxena et al. reported a statistically important difference in the educational status of women, with women with lower educational status preferring VD and more-educated women preferring CD.[6,10]

Obstetric Score

Primigravids constituted 36% (n = 363) of the study population. Multigravidas were more likely to choose CD over VD, which was statistically significant (p-value < 0.001). Logistic regression showed similar results with unadjusted OR 1.71 and adjusted OR 1.56 (p-value < 0.009). Their main motivations were their fears of childbirth pains, vaginal exams, and vaginal damage. With little doubt, this group would gain from specialized therapy and discussions of birthing pain management. Similar results were reported from Iran by Abbaspoor and Noori[13] However, Saxena et al. reported no difference in the choice between primigravida or multigravida.

Source of Information

In our study, the most commonly reported source of information was Healthcare professionals, which included predominantly Accredited Social Health Activists (ASHA) and partly doctors and nurses. Participants who received information from healthcare professionals (OR: 0.17, 95% CI: 0.09–0.28, p-value < 0.001) were less likely to choose LSCS. This underscores the need for proper counseling of expectant mothers by healthcare professionals, which can help decrease the rising and unhealthy trends of CD.

Strengths and Limitations

The large sample size and a good representation of younger (< 30 years) as well as older women (≥30 years) are a few strengths of the study. However, it is essential to note the limitations. Disproportionate distribution of habitat (rural and urban) and mode of previous delivery (nearly 50% had previous LSCS, and only 10% had VD). The single-center study design in a public sector (Tertiary Care Center) limits the generalizability of the study results. The preferences and factors affecting the same may differ at primary or secondary care centres and in private healthcare setups.

Conclusions

The increasing rates of cesarean deliveries in Kashmir are worrisome. More than half of the women prefer LSCS as a mode of delivery should be a matter of concern for both health authorities and society. This study sheds light on the factors that impact the choices of women who are preparing to give birth. It emphasizes the importance of medical professionals discussing the benefits and process of a natural vaginal delivery with patients and their partners.

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