



An Observational Study to Assess Maternal and Foetal Factors Affecting Mode of Delivery in Primigravida

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Abstract

Introduction: Child birth is a beautiful and lifetime experience for a woman. During these period women have more concerns about their mode of delivery especially in the first delivery.¹ Vaginal birth continues to be the most common form of birth but caesarean rates in the world are increasing day by day.⁴ So purpose of this study is to find various socio-demographic and obstetric factors which may influence the mode of delivery in primigravida and associated factors with increasing caesarean section rates.

Methods: This observational study was conducted in Department of Obstetrics & Gynecology, in a tertiary care institute located in central India, over a period of 12 months. 350 primigravida women with live singleton pregnancy of >28 weeks were studied in terms of maternal and perinatal outcome. Data was studied and statistically analysed.

Results: Women who were literate, with BMI <18.5 Kg/m², Hindu, with history of receiving infertility

treatment, belonging to low socio-economic status, residing in urban region, age below 25 years were more likely to undergo caesarean delivery. Various obstetric factors which predispose a woman for caesarean delivery were blood-stained liquor, Bishop’s score <6, meconium stained liquor, GA more than 40 weeks and GA between 28 to <37 weeks.

Keywords: Caesarean rates, Subsequent pregnancies, Vertex presentation

Introduction

Child birth is a beautiful and lifetime experience for a woman. During these period women have more concerns about their mode of delivery especially in the first delivery.¹

Vaginal birth continues to be the most common form of birth but caesarean rates in the world are increasing day by day.² A substantial proportion of this increase CD rate has been attributed to unnecessary operations attributable to medico legal reasons, scheduling issues, economic pressures, provider and patient-driven medicalization of

birth,^{4,5} increased induction rates⁶ and a broader perception of caesarean as a safe method of delivery⁷

In India there is increase in caesarean section in both public and private sector from 11.9% and 40.9% respectively (NFHS-4,2015-2016) to 14.3% and 47.4% respectively (NFHS-5, 2019-2021) and in Rajasthan there is increase in caesarean rate from 8.36% (as reported by NFHS-4 in 2015-2016) to 10.4% reported by NFHS-5 in 2019-2021.³

The rising trend in favour of caesarean section has not been accompanied by significant maternal or perinatal benefits. It has been associated in the long-term with an increased risk of asthma, obesity in children, and complications in subsequent pregnancies, such as uterine rupture, placenta accreta, placenta previa, ectopic pregnancy, infertility, hysterectomy, and intraabdominal adhesions. The risk of these morbidities is progressively increasing since the number of previous caesarean deliveries is increasing.^{8,9} Hence women who are nulliparous, at full term, with a singleton pregnancy in vertex presentation (NTSV) have been established as a standard population and used as a target group for reducing the caesarean birth rates^{10,15}

A number of studies on factors affecting women's preferred mode of delivery have identified multi-factorial causes. Very few studies have been done in our state to assess factors influencing mode of delivery in primigravida so this study was done to find various socio-demographic and obstetric factors which may influence the mode of delivery in primigravida and associated factors with increasing caesarean section rates.

Material and Methods

Study type: Observational study.

Study design: Hospital based prospective study.

Study location: Department of Obstetrics & Gynaecology, SMS Medical College, Jaipur.

Study duration: From November 2022 to November 2023 and two months for data compilation & analysis.

Study Universe: All pregnant women admitted in labour room for delivery at obstetrics & Gynaecology of SMS Medical College, Jaipur

Study population: Primigravida with live singleton pregnancy of >28 weeks gestation

Inclusion Criteria

- Primigravida with live singleton pregnancy of >28weeks period of gestation with cephalic presentation
- Who understand the study & willing to participate in the study and giving informed and written consent
- Not participating in other study.

Exclusion Criteria

- Primigravida posted for elective LSCS
- Congenital malformations

Sample Size

Sample size is calculated to be 348 pregnant women as previous studies shows facility factor of vaginal delivery with maternal age as 34.81%. For 80% power, 0.05 alpha-error and 5% absolute error, 350 is taken as sample size. ⁶

Methodology

Thorough history and examination was done in all women included in the study. Demographic and Anthropometric data was collected from each participant at the time of initial checkup and it included age, ethnicity, literacy, and socioeconomic status, history of infertility treatment, presence of medical disorders (GDM, Pre-eclampsia, hypothyroidism, liver disease of pregnancy), APH, Preterm labour, PROM, induction of labour, cephalopelvic disproportion and contracted pelvis was also be noted. Obstetric factors like presentation, cord around neck, IUGR, meconium stain liquor, gestational age, estimated foetal weight were also noted.

Women were monitored throughout labour till delivery and mode of delivery was noted as normal vaginal delivery, caesarean section and instrumental vaginal delivery.

Foetal outcome were measured as Apgar Score at 5 minutes, need & reasons of NICU admission, perinatal mortality and birth weight.

Result and Discussions

Table 1: Distribution on the basis of mode of delivery

Mode of Delivery	Number	Percentage
Vaginal Delivery	185	52.9
Caesarean Delivery	165	47.1

Graph 1:

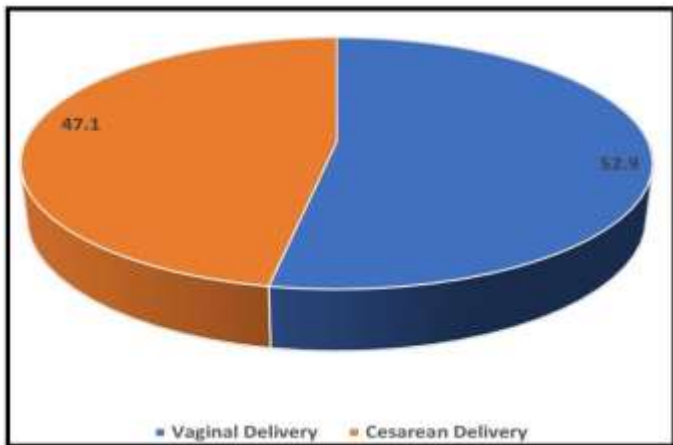


Table 2: Socio-demographic Factors likely to influence mode of delivery

Variables	Mode of Delivery		Odd Ratio
	CS	VD	
Age in Years			
<25	92	116	1.334; (0.8695-2.0465), p – 0.1
≥25	73	69	
Booking Status			
Unbooked/Referred	91	96	1.1401; (0.7483-1.7370), p – 0.5
Booked	74	89	
Socio-economic Status			
Low	37	23	1.5211, (0.8605-2.6891), p – 0.1

Middle	147	139	1
Upper	1	3	0.3152; (0.0324-3.0664), p – 0.3
Residence			
Rural	75	100	1.4902;(0.9804-2.2650), p – 0.06
Urban	95	85	
Religion			
Hindu	132	138	3.4731; (1.7570–6.8654), p – 0.0003
Muslim	33	47	
Literacy Status			
Literate	105	54	4.2454; (2.7113-6.6475), p - <0.0001
Illiterate	60	131	
History of Infertility Treatment			
Yes	20	12	1.9885; (0.9403-4.2052), p – 0.07
No	145	173	
BMI (Kg/m²)			
<18.5	1	4	3.9467; (0.4309-36.1481), p – 0.2
18.5-22.9	74	75	
23-24.9	67	88	1.2959; (0.8248-2.0361), p – 0.2
≥25	23	18	0.7722; (0.3852-1.5478), p – 0.4

Above table shows socio-demographic factors likely to influence mode of delivery in primigravida. In present study, women below 25 years are 1.3 times more likely to have caesarean section [OR 1.334; (0.8695-2.0465), p – 0.1], women admitted as un booked or referred were 1.14 times more likely to have caesarean delivery [OR 1.1401; (0.7483-1.7370), p – 0.5]. Heydari ST et al in their study observed that age of mother (OR=3.2,95%CI:2.6-3.9), and living in a suburban area (OR=1.3,95%CI:1.08-1.5) had a significant effect on choosing C/S as a method of delivery in pregnant women.¹⁰⁷ Iqra Rehman Wani et al in their study observed that women with increasing age [OR: 1.61,

95% CI: 1.22–2.13, p-value = 0.001] preferred caesarean delivery over vaginal delivery. Women residing in urban areas (OR: 1.93, 95% CI: 1.44–2.59, p-value < 0.001) were more likely to have caesarean delivery. It seems that the higher tendency to choose a C-section in older women may arise from the association between older age and medical problems.

In present study women belonging to low socio-economic status were 1.5 times more likely to have caesarean delivery [1.5211, (0.8605-2.6891), p – 0.1] while upper socio-economic status was protective for caesarean delivery [0.3152; (0.0324-3.0664), p – 0.3]. Women who were literate were 4.2 times more likely to undergo caesarean section compared to literate counterparts. Varghese et al and Saxena et al¹² 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.^{6,13} Education level often leads to marriage and pregnancy at older ages, which causes problems and complications and ultimately results in C-sections. However, in another study, there was no significant

Table 3: Obstetric Factors likely to influence mode of delivery

Variables	Mode of Delivery		Odd Ratio
	CS	VD	
POG			
28 - <37 week	56	41	2.1266; (1.3001-3.4785), p – 0.002
≥37- 40 week	79	123	1
> 40 week	30	21	2.2242; (1.1903-4.1561), p – 0.01
Bishop’s score			
<6	111	35	16.5248; (8.8825-30.7423), p - <0.0001
6-8	26	51	2.6563; (1.3441-5.2498), p – 0.004
>8	19	99	1
Need for Induction of labor			
Yes	108	69	3.1854; (2.0558-4.9356). p - <0.0001

relationship between the age and education level of couples and the choice of C-section.

In present study women who belonged to Hindu religion were 3.4 times more likely to undergo caesarean section compared to women who belonged to Muslim religion.

In present study women who had taken infertility treatment were 1.9 times more likely to undergo caesarean section compared to women had not taken any infertility treatment. The results are comparable with study done by Alkhazal BA et al. They observed that women who had taken treatment for infertility were 2.3 times more likely to have caesarean [2.369;(0.646-8.693), p-0.1].¹⁷

In present study women who had BMI <18.5 Kg/m² were 3.9 times more likely to undergo caesarean section compared to women with BMI between 18.5-22.9Kg/m² which is in contrast with study done by Gondwe T et al.¹⁸ They observed that overweight/obese women were 1.6 times more likely to have caesarean delivery.¹⁸ Obese women have been observed to have prolonged duration of labour compared to normal-weight women.¹¹

No	57	116	
Colour of liquor			
Blood Stained	13	1	21.6667; (2.7939-168.0233), p -0.003
Meconium Stained	47	9	8.7037; (4.0987-18.4825), p - <0.0001
Clear	105	175	1
Birth weight			
<2.5	71	65	1.3944; (0.9058-2.1466), p – 0.1
≥2.5	94	120	

Above table shows obstetric factors likely to influence mode of delivery in primigravida. In present study women who had period of gestation was 28-<37 week were 2.1 times more likely to have caesarean section. Women who had period of gestation >40 weeks were 2.2 times more likely to undergo caesarean section.

In present study women with lower Bishop’s score (<6) were 16 times more at risk of undergoing caesarean delivery and women who had bishop score 6-8 had 2.6 times more likely to undergo vaginal delivery which is in line with observation made by Kumaraswamy R¹⁴ and Vahratian A. et al¹⁹, however found that the rate of caesarean section was linked to low bishop score, women who had an elective induction with cervical ripening had 3.5 times the risk of caesarean delivery during the first stage of labour (95% confidence interval 2.7-4.5).

In present study women who needed induction of labour were 3 times more at risk of caesarean delivery which is consistent with study done by Kumaraswamy R.¹⁴ and Peregrine et al. they showed that induction of labour in nulliparous women has a higher risk of caesarean delivery. Ahmed I et al⁷ observed that induction of labour was significantly associated with MOD. The patients delivered through CS were twice more likely to have induction of labour as compared to those delivered virginally. [Adjusted Odd Ratio (AOR) 1.87; 95% CI: 0.99, 3.54; P value: 0.053]. Similar results were observed

by Galzie, et al. In their study the rate of caesarean section was higher in the induction of labour group (34%) than the spontaneous onset of labour group (11.4%). This was similar to the study conducted by Thangarajah et al.² who found that within the subgroup of primiparous women, there was higher risk of caesarean delivery in the induction of labour (IOL) group. However, Runa et al⁴ found that there was no difference between the study groups in the rate of caesarean delivery (28 and 33 in the induction and monitoring group, respectively).

In present study women who had blood stained liquor were 21 times more likely to undergo caesarean section, those who had meconium stained liquor were 8 times more likely to undergo caesarean section.

In present study Birth weight <2.5 Kg was 1.4 times more likely to predispose women for caesarean delivery which is in contrast with observation made by Kumaraswamy R¹⁴ and Kim SN et al, where higher birth weight has an increased need for caesarean delivery.

Conclusion

In present study it was observed that women who were literate, with BMI <18.5 Kg/m², Hindu, with history of receiving infertility treatment, belonging to low socio-economic status, residing in urban region, age below 25 years were more likely to undergo caesarean delivery.

Various obstetric factors which predispose a woman for caesarean delivery were blood-stained liquor, Bishop's score <6, meconium stained liquor, GA more than 40 weeks and GA between 28 to <37 weeks.

Further studies are needed to elucidate causes of high caesarean delivery and to identify modifiable factors for nonmedically indicated caesarean deliveries. Strategies to prevent primary caesarean may be the most effective intervention to decrease the overall caesarean rate.

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