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# Analysis of Sociodemographic Characteristics as Risk Factors for Cesarean Delivery in Induced Labor at Term

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**Original Research Article**

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**Abstract:** To analyse sociodemographic characteristics as risk factors for cesarean delivery in induced labor at term. Descriptive type of Observational study at Department of Obs & Gynae Department, S.M.S. Medical College, Jaipur on 120 antenatal women induced at term fir various indications. Cesarean delivery rate was higher in advanced maternal age, high socioeconomic status, higher education, urban population and working women
**Keyword:** Induction, Labor, Sociodemography, Cesarean delivery.

## INTRODUCTION

Induction of labor is the initiation of contractions in a pregnant woman who is not in labor to help her achieve a vaginal birth. Induction is indicated when the risk of continuing the pregnancy, for the mother or the foetus, exceeds the risk associated with induced labor and delivery. Labor inductions now exceed 20% of all births in many countries [1,2]. The practice of timed labor has been practiced since time of Hippocrates descriptions of mammary stimulation and mechanical dilatation of the cervix [3]. Since then many advances have taken place in labor induction. Numerous non-pharmacological methods such as dilators, laminaria tents, Foley's catheters and amniotomy and pharmacological methods such as prostaglandins and oxytocin. The use of prostaglandins, especially Prostaglandin $E_2$ has become a common practice.

Common indications for induction of labor are postdated and post-term pregnancies, hypertensive disorder of pregnancy, gestational diabetes mellitus, oligohydramnios, Rh negative pregnancy, polyhydramnios, cholestasis of pregnancy, intrauterine fetal demise.

Labor induction is contraindicated when vaginal delivery would endanger the life of the mother or foetus. Common contraindications include contracted pelvis placenta previa, transverse fetal lie, prolapsed umbilical cord, and prior classical uterine incision.

Factors that have been shown to influence success rates of induction include the Bishop score, parity (prior vaginal delivery), BMI, maternal age, estimated fetal weight, and diabetes. Induction of labor is associated with increased risk of emergency cesarean section. The rising cesarean delivery rate has become a cause of major concern because of the long-term implications, both maternal and foetal. Moreover, the risks associated with emergency cesarean are much more than an elective one.

This study aims to study the sociodemographic profile of the patients as risk factors for cesarean delivery when labor is induced at term.

## MATERIALS AND METHODS

Our study was a Descriptive type of Observational study carried out at Department of Obstetrics and Gynecology, S.M.S. Medical College and Associated Group of Hospitals, Jaipur between March 2016- December 2017. Study subjects were 120 women who consented to be a part of the study with a singleton live fetus in cephalic position and induced at gestational age equal to or more than 37 weeks by cervical ripening with Prostaglandin $E_2$ gel. They were induced for indications such as hypertension, gestational diabetes, cholestasis, oligohydramnios, intrauterine growth restriction, postdatism and Prelabor

rupture of membranes. The outcome, that is, cesarean section or vaginal delivery was analyzed on basis of sociodemographic factors. Medcalc 12.2.1.0 version software was used for all steps used in calculations.

## RESULTS

**Table-1: Distribution of Study Subjects in relation to Maternal Age**

| Maternal age (years) | Cesarean Section | | Vaginal Delivery | | Total |
|---|---|---|---|---|---|
| | N | % | N | % | |
| ≥ 35 years | 12 | 25.5 | 13 | 17.8 | 25 |
| <35 years | 35 | 74.5 | 60 | 82.2 | 95 |
| Total | 47 | 100.0 | 73 | 100.0 | 120 |

Odds ratio = 1.582 (95% confidence interval: 0.651 to 3.848)
Chi-square = 0.619 with 1 degree of freedom;

Table 1 shows the distribution of cesarean and vaginal delivery with respect to maternal age. Risk of Cesarean section was found to be 1.58 times higher in ≥ 35 years group as compared to < 35 years group.

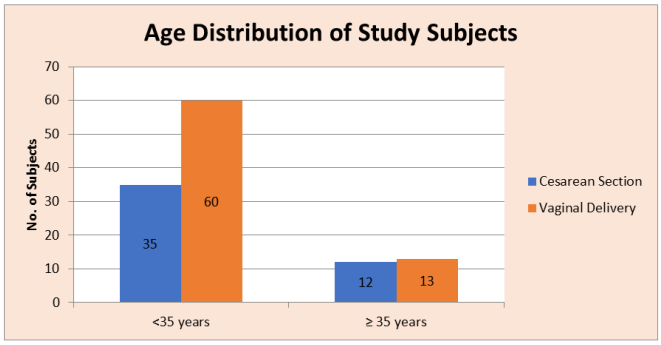


**Chart 1**

**Table-2: Distribution of Study Subjects in relation to their Residence**

| Residence | Caesarean Section | | Vaginal Delivery | | Total |
|---|---|---|---|---|---|
| | N | % | N | % | |
| Urban | 33 | 70.2 | 45 | 61.6 | 78 |
| Rural | 14 | 29.8 | 28 | 38.4 | 42 |
| Total | 47 | 100.0 | 73 | 100.0 | 120 |

Odds ratio = 1.46 (95% confidence interval: 0.670 to 3.210 )
Chi-square = 0.585 with 1 degree of freedom;

The cesarean delivery rate was increased (Odds Ratio=1.46) in population who resided in urban areas (Table 2). Table 3 shows that there was 1.860 times increased incidence of cesarean section in Hindu population as compared to Muslim and others.

**Table-3: Distribution of Study Subjects in relation to their Religion**

| Religion | Cesarean Section | | Vaginal Delivery | | Total |
|---|---|---|---|---|---|
| | N | % | N | % | |
| Hindu | 32 | 68.1 | 39 | 53.4 | 71 |
| Muslim and others | 15 | 31.9 | 34 | 46.6 | 49 |
| Total | 47 | 100.0 | 73 | 100.0 | 120 |

Odds ratio = 1.860 (95% confidence interval: 0.864 to 4.003)
Chi-square =1.973 with 1 degree of freedom;

**Table-4: Distribution of Study Subjects in relation to Maternal Education**

| Maternal Education | Cesarean Section | | Vaginal Delivery | | Total |
|---|---|---|---|---|---|
| | N | % | N | % | |
| Graduate and above | 23 | 48.9 | 26 | 35.6 | 49 |
| Secondary and below | | 51.1 | | 64.4 | |

| | | | | | |
|---|---|---|---|---|---|
| | 24 | | 47 | | 71 |
| Total | 47 | 100.0 | 73 | 100.0 | 120 |

Odds ratio = 1.732 (95% confidence interval: 0.822 to 3.653 )
Chi-square =1.584 with 1 degree of freedom;

From table 4 we infer that cesarean delivery is 1.732 times in educated population (Graduate and above) as compared to their less educated counterparts. The cesarean delivery rate was 2.786times in working women as compared to women who are homemakers. P = 0.066

**Table-5: Distribution of Study Subjects in relation to Maternal Occupation**

| Maternal occupation | Cesarean Section | | Vaginal Delivery | | Total |
|---|---|---|---|---|---|
| | N | % | N | % | |
| Working women | 12 | 25.5 | 8 | 11.0 | 20 |
| Homemaker | 35 | 74.5 | 65 | 89.0 | 100 |
| Total | 47 | 100.0 | 73 | 100.0 | 120 |

Odds ratio = 2.786 (95% confidence interval: 1.041 to 7.456 )
Chi-square = 3.386 with 1 degree of freedom;

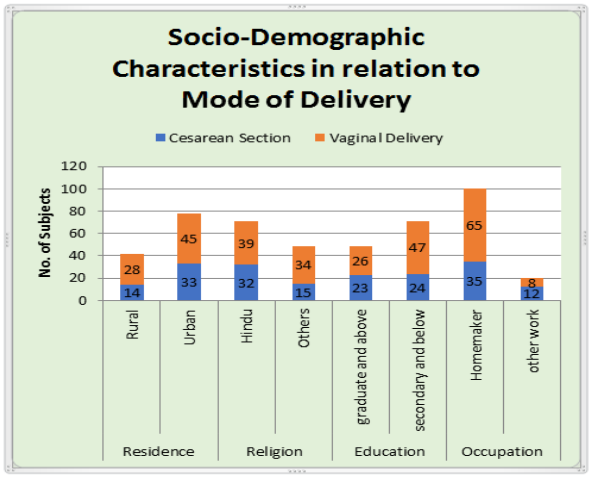


**Table-6: Distribution of Study Subjects in relation to Socio-economic Status**

| SES | Cesarean Section | | Vaginal Delivery | | Total |
|---|---|---|---|---|---|
| | N | % | N | % | |
| Lower | 9 | 19.1 | 14 | 19.2 | 23 |
| Middle | 33 | 70.2 | 58 | 79.5 | 91 |
| Upper | 5 | 10.6 | 1 | 1.4 | 6 |
| Total | 47 | 100.0 | 73 | 100.0 | 120 |

Chi-square = 5.234 with 2 degrees of freedom
Odds Ratio for Upper to Middle class:88.03
Odds Ratio for Upper to Lower class:7.78
Table 6 shows that the population from upper class was more likely to have cesarean section as compared to those belonging to middle and lower class.

## DISCUSSION

The cesarean delivery rate was higher in women with advanced maternal age. This is because with age the anatomical and physiological changes in pelvis and musculature take place which are not favourable for vaginal delivery. A lot of these women are infertility treated as well. The obstetrician has a more cautious attitude towards such patients, hence, increased cesarean delivery rate. Maslow AS, Sweeny AL [4] conducted a study in Washington which showed that increasing maternal age increased the risk of cesarean delivery after induction of labor particularly among nulliparas. In a case-control study conducted by Nilesh Mahske *et al.* [5] in 2014 on 277 women, the women with age more than 35 years were 8.68 times more likely to have cesarean section after induction of labor than women who were younger than 35 years. Liam Dunn *et al.* [6] in 2017 conducted a study in women with advanced maternal age and who were induced at term and concluded that following induction of labor, advanced maternal age was associated with a two-fold increased likelihood of birth by cesarean.

There is increased cesarean delivery rate in urban population. This is probably because of the sedentary lifestyle, obesity and medical disorders being more common among these women. This is in contrast

to the study by Abdulkadir Y *et al*. [7] who found increased cesarean rate in rural population. This is due to differences in social, cultural and demographic profile of the population.

The cesarean delivery rate was higher in Hindu population as compared to Muslims and other religions. This is because the age of marriage is later in Hindu population. In Muslims, early childbearing and multiparity favours vaginal delivery.

The cesarean delivery rate is higher in working women and women with higher seduction and socio-economic class. The reason for increased cesarean delivery rate is probably the psychology of the women. These women have poor bearing down efforts and have a poor attitude towards vaginal delivery. It is said, 'tense mind- tense cervix'. Besides, this class of women have increased at age first childbearing, sedentary lifestyle and other medical disorders which make them prone to cesarean section after induction of labor.

## CONCLUSION

Sociodemographic factors are risk factors in cesarean delivery in induced labor at term besides the obstetric risk factors

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