



STUDY OF DETERMINANTS AND RATE OF CAESAREAN SECTION IN A TERTIARY CARE HOSPITAL

Obstetrics & Gynaecology

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ABSTRACT

Background- Caesarean section rates are constantly on a rise worldwide. It is a life saving intervention and helps to improve maternal and neonatal outcome. At the same time these procedures are being done without any clinical justification. The objective of this study was to assess the rate and determinants of caesarean section in our hospital. **Methods-** This was a prospective observational study with a sample size of 1166 patients who underwent caesarean section at our hospital during the period January 2019 to June 2020. Distribution of patients according to sociodemographic characteristics, obstetrical factors and indications of caesarean section were studied. **Results-** The incidence of caesarean section in our hospital during study period was found to be 46.7%. 30.4% patients were referred for delivery and tertiary care. Among patients undergoing caesarean section, 73.9% were primigravida. Emergency caesarean was carried out in 77.6% patients and the commonest indication was fetal distress. **Conclusion-** The rate of caesarean section in our study was higher than that stated by WHO, with the main determinants being high risk referrals and sociodemographic factors.

KEYWORDS

Caesarean section, rate, determinants.

INTRODUCTION

Caesarean delivery, also known as caesarean section, is defined as the delivery of a fetus through incisions in the abdominal wall (laparotomy) and the uterine wall (hysterotomy) after 28 weeks of pregnancy. It is probably the most common surgical procedure carried out in the field of obstetrics. Over the recent years there has been a parallel increase in the rate of caesarean section with the evolvement of medical science. The caesarean section rate is approximately 21.1% for the most developed regions, 14.3% for the less developed regions, and 2% for the least developed regions.¹

Caesarean section has proved to be a life-saving intervention during deliveries where the mother or baby is at significant risk of adverse outcome. Many high maternal mortality regions are still struggling to provide safe and timely caesarean sections, yet women worldwide are increasingly undergoing procedures for which there is little clinical justification. These 'unnecessary' caesarean sections have been associated with increased risk of maternal morbidity and even mortality. High rates of caesarean sections also have an economical burden on patients and their families due to higher costs and a longer period of hospitalization, especially in low and middle-income countries.

It is widely accepted, including by the World Health Organization (WHO), that caesarean deliveries should be undertaken only where medically necessary.^{2,3} Indications for caesarean delivery have been changing as they have become safer due to improved anesthesia techniques, advent of powerful and effective antibiotics, availability of blood transfusion facilities and improvement in surgical techniques and operative skills and neonatal care.

The increase in caesarean deliveries has been attributed to multiple factors ranging from maternal, socio-demographic and institutional factors. Caesarean delivery rates are known to rise with the increase in maternal age, order of birth, baby weight, socioeconomic status, adoption of small family norm and high levels of maternal education. Fear of litigation in doctors and lesser acceptability of vaginal birth in doctors and patients in previous caesarean section and obstetric complications has significantly escalated rate of caesarean deliveries. These rates are also influenced by an increase in maternal demand of caesarean section in the absence of any medical indication due to anxiety about the delivery or pre-decided time of delivery.

Scientific progress in the form of advancement in antepartum fetal surveillance leading to identification of at risk fetus, easy availability of antenatal care and identification of high risk mothers and an increase in conceptions following assisted reproductive techniques are responsible for rising trend of caesarean delivery. These factors taken together with the public perception that a caesarean delivery is now an

almost risk-free procedure might well be contributing to the rise in the number of caesarean sections performed.⁴

A caesarean section is a surgical technique which can lead to numerous complications in both mother and the fetus. Hence this procedure should only be performed when clear advantages are to be gained and not as an alternative to spontaneous childbirth. Rise in repeat caesarean deliveries and placenta accreta leading to obstetric hysterectomy are long term implications of increase in caesarean sections.

The overall rate of caesarean section in India was 8.5% in 2005-2006, 17.2% in 2015-16, and in 2019-2021, it increased to 21.5%.⁵

Hence the present study was carried out to assess the determinants and rate of caesarean section at our tertiary care centre.

MATERIAL AND METHODS

A hospital based prospective observational study was conducted for 18 months from July 2019 to Jan 2021 in a tertiary care hospital after obtaining clearance from Institutional Ethical Committee. All antenatal patients beyond 32 weeks of gestation delivering by caesarean section at this hospital were included after their informed consent for the study.

They were subjected to a thorough history taking using a questionnaire and general and physical examination. Information including age, parity, gestational age, antenatal care, stage of labor at admission and prior to intervention, onset of labor spontaneous or induced, use of oxytocin infusions, instrumentation and reason for referral to this hospital was noted.

The Following Parameters Were Recorded

1. Total number of deliveries
2. Total number of caesarean section
3. Rate of caesarean section
 $\text{Total number of caesarean section in 1.5 year} \times 100$
Total number of deliveries in 1.5 year
4. The factors contributing to caesarean section

The data was analysed and results were expressed as percentages and frequency tables.

RESULTS

There were 2500 deliveries in our hospital of which 1331 (53.3%) deliveries were normal deliveries while 1166 (46.7%) deliveries were caesarean section. Hence the incidence of caesarean section in our hospital during study period was 46.7%.

Majority of the patients were in the age group of 18-24 years (67.7%)

followed by 25-35 years (30.4%) and >35 years (1.9%). The mean age of patients was 23.14 ± 4.20 years. 66.5% patients were from urban areas while 33.5% patients were from rural areas. Majority of patients were from upper middle class (34.8%) followed by lower middle class (24.2%), lower class (16.1%), upper lower class (13.7%) and upper class (11.2%).

812 (69.6%) patients were booked cases while 354 (30.4%) patients were referred for delivery. Majority of the patients had BMI in the range of 25 to 29.9 kg/m² (47.8%) followed by >30 kg/m² (42.9%) and 18.5 to 24.9 kg/m² (9.3%). (Table 1)

Table 1 Distribution Of Patients According To Socio Demographic Factors

Characteristics	Number of patients	Percentage (%)
Age (yrs)		
18-24	789	67.7
25-35	355	30.4
>35	22	1.9
Residence		
Rural	775	66.5
Urban	391	33.5
Socioeconomic status		
Upper	131	11.2
Upper Middle	406	34.8
Upper lower	160	13.7
Lower middle	282	24.2
Lower	187	16.1
Booking status		
Booked	812	69.6%
Unbooked	354	30.4%
BMI		
18.5-24.9	109	9.3%
25-29.9	557	47.8%
>30	500	42.9%

A total of 862 (73.9%) patients were primigravida while 304 (26.1%) patients were multigravida. Most of the multigravida patients were of the birth order second to fourth (25.5%). Majority of patients were in the gestational age of 37-40 wks (73.5%), followed by >40 wks (18.3%) and <37 wks (8.2%). The commonest presentation in our study was vertex (82.1%) followed by breech (9.9%), shoulder (6.8%), cord (0.6%) and face (0.6%). Elective caesarean section was performed in 261 (22.4%) patients while emergency caesarean section was done in 905 (77.6%) patients. Majority of the neonates weighed in the range of 2.6-3.5 kg (52.8%) followed by 1.5-2.5 kg (34.8%), >3.5 kg (8.7%) and <1.5 kg (3.7%). The mean birth weight of neonates was 2.79 ± 0.61 kg. (Table 2)

Table 2 Distribution Of Patients According To Obstetrical Characteristics

Characteristics	Number of patients	Percentage (%)
Parity		
Primi	862	73.9
Multi	304	26.1
Gestational age (wks)		
<37	96	8.2%
37-40	857	73.5%
>40	213	18.3%
Presentation		
Vertex	958	82.1%
Breech	115	9.9%
Shoulder	79	6.8%
Cord	7	0.6%
Face	7	0.6%
Type		
Elective	261	22.4%
Emergency	905	77.6%
Birth weight (kgs)		
<1.5	43	3.7%
1.5-2.5	406	34.8%
2.5-3.5	616	52.8%
>3.5	101	8.7%

Fetal distress was the most common indication for caesarean section (26.1%) followed by failed induction (19.2%), breech (16.8%), Cephalopelvic disproportions (CPD) (13.7%), malpresentations (8.1%), oligohydramnios (4.3%), multiple gestation (4.3%), placenta

previa (3.7%), abruption (2.5%), obstructed labor (0.6%) and cord accidents (0.6%).

Table 3: Distribution Of Patients According To The Indication Of Caesarean Section

Indication of caesarean section	Number	Percentage (%)
Fetal Distress	306	26.1%
Failed induction	224	19.2%
Breech	196	16.8%
Cephalopelvic disproportion	160	13.7%
Malpresentations	94	8.1%
Oligohydramnios	50	4.3%
Multiple gestation	50	4.3%
Placenta previa	43	3.7%
Abruption	29	2.5%
Obstructed labour	7	0.6%
Cord complications	7	0.6%
Total	1166	100%

DISCUSSION

A hospital based observational study was conducted with 1166 patients to study determinants and rate of caesarean section in a tertiary care hospital.

There is an increasing trend of caesarean section deliveries worldwide. WHO statement on caesarean section rates concluded that there is no justification for any region to have a caesarean section rate higher than 10-15% for attaining the best maternal and fetal outcome.¹

The reasons for the increase in the caesarean rates are multifaceted. Detection of fetal distress especially with the use of continuous electronic fetal monitoring, liberal use of caesarean in high risk cases like breech presentation, previous caesarean delivery, growth retarded fetus etc., avoidance of difficult manipulative or instrumental vaginal deliveries and patient's demand are some important reasons.

In the present study, the incidence of caesarean section in our hospital during study period was 46.7%. This was similar to the studies of Bala S et al⁶, Banerjee A et al⁷, and Gupta N et al⁸. Bala S et al⁶ conducted a retrospective study analyzing the indications and frequency of caesarean sections and found an overall caesarean section rate to be 39.60%. The rate of primary Caesarean section was 56.93%. Banerjee A et al⁷ retrospective study analyzing the rate of caesarean deliveries and indications of the procedure showed a 34.1% incidence of caesarean section.

In our study, 67.7% of the patients were in the age group of 18-24 years followed by 30.4% between 25-35 years. The mean age of patients was 23.14 ± 4.20 years. This was comparable to the studies of Bala S et al⁶, Santhanalakshmi C et al⁹ and Banerjee A et al⁷ which showed a rate of caesarean sections in the age group of 21-30 years to be 90.04%, 76.4% and 73.24% respectively.

It was observed in the present study that 73.9% patients were primigravida while 26.1% patients were multigravida which corroborated with the study by Banerjee A et al⁷ showing 54.47% to be primigravida.

Majority of the patients were in the gestational age of 37wks to 40wks (73.5%) followed by >40wks (18.3%) and <37wks (8.2%). This was in accordance to the studies of Bala S et al⁶, Santhanalakshmi C et al⁹ and Banerjee A et al⁷.

812 (69.6%) patients were booked cases while 354 (30.4%) patients were unbooked cases in our study. Most of the unbooked patients were high risk pregnancies that were referred in emergency for tertiary care. This was consistent with the studies of Santhanalakshmi C et al⁹ where 52% patients were booked and 48% were unbooked or referrals.

In the present study, majority of the patients (66.5%) were from urban areas while 391 (33.5%) patients were from rural areas. The location of the institution and the type of health care facility available in nearby areas play a vital role in this matter. Banerjee A et al⁷ retrospective study observed majority of the patients (68.37%) belonged to the rural areas and 31.63% cases were from urban areas while Gupta M et al⁸ found most of the cases belonging to urban areas.

In our study, commonest presentation was vertex (82.1%) followed by

breech (9.9%), shoulder (6.8%), cord (0.6%) and face (0.6%).

Elective caesarean section was performed in 261 (22.4%) patients while emergency caesarean section was performed in 905 (77.6%) patients. Studies by Bala S et al⁶ and Banerjee A et al⁷ showed 71.19% and 75.6% caesarean section as emergency procedures respectively. It was observed in the present study that fetal distress was the most common indication (26.1%) followed by failed induction (19.2%), breech (16.8%) and cephalo-pelvic disproportion (13.7%). Banerjee A et al⁷ retrospective study showed that fetal distress (32.8%) was the commonest cause followed by previous caesarean pregnancy (26.76%). Santhanalakshmi C et al⁹ retrospective study showed commonest indication for caesarean section was repeat caesarean (43%), followed by CPD (15%), failed induction (10%) and fetal distress (7%).

Majority of the neonates weighed in the range of 2.6- 3.5 kg (52.8%) followed by 1.5- 2.5 kg (34.8%), >3.5 kg (8.7%) and <1.5 kg (3.7%). The mean birth weight of neonates was 2.79 ± 0.61 kg.

CONCLUSION

Based on this study, we conclude that in our hospital, emergency caesarean section were more as compared to elective procedures and referred high risk cases contributed significantly to the increase in the rate of caesarean section.

Caesarean delivery is becoming a primary mode of delivery without any medical consideration. These unnecessary deliveries need to be checked in priority for the wellbeing of mother and child. As primary caesarean section usually determines the future obstetric course, hence adoption of different strategies and changing clinical practice for delivery of breech presentation, previous caesarean section, detection of true fetal distress and labor dystocia and unbiased implementation of such protocols are some of the ways to reduce the caesarean section rate in any tertiary setup.

It is of prime importance to give effort for safe reduction of caesarean section. Individualization of the indication and careful evaluation, following standardized guidelines and practice of evidenced-based obstetrics followed by audits in the institution, can help us limit the caesarean rates.

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