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Original Research Article

## Trends of caesarean section: an analytical overview of indications

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### ABSTRACT

**Background:** Caesarean section is one of the commonly performed surgical procedures in obstetrics. An increasing trend has been observed in both primary and repeat caesarean sections. The reasons for its increase are multifaceted. So, this study was carried out to compare the rates of caesarean delivery and to analyse various indications contributing to it.

**Methods:** This retrospective study was conducted over a period of three year from 1<sup>st</sup> January 2016 to 31<sup>st</sup> December 2018 at the department of obstetrics and gynaecology, tertiary care hospital Pune, Maharashtra, India. All caesarean delivery (primary and repeat) taken place during the study period. The rate and indications of caesarean section was calculated over the study period to find out the trends in caesarean delivery. The data so collected was presented with graphical representation. Statistical analysis was performed with SPSS software and t-test was used for continuous data and pearson chi square test for discrete data.

**Results:** There were a total of 12373 deliveries during the study period out of which, 3701 had delivered via Caesarean Section. So, the rate of caesarean section in the study was found to be 29.91%.

**Conclusions:** Being a tertiary care hospital, a high rate of caesarean deliveries was observed, Individualization of the indication and careful evaluation, following standardized guidelines, practice of evidenced-based obstetrics and audits in the institution, can help us limit caesarean section rates.

**Keywords:** Caesarean section, Caesarean rates, Caesarean section rate, Deliveries, Indications of caesarean section, Lower segment caesarean section

### INTRODUCTION

Caesarean section is one of the commonly performed surgical procedure in obstetrics. The rates of caesarean delivery have increased in last few decades in both developed and developing nations. An increasing trend has been observed in both primary and repeat caesarean sections.<sup>1</sup> The reasons for its increase are multifaceted. According to WHO there is no justification for any region to have caesarean section rates higher than 10-15%.<sup>2</sup> In USA, the rate was 27.5% in the year 2003 which increased to 32.8%.<sup>3</sup> In 2015 this increase in caesarean section rate (CSR) has become a major public health issue, because;<sup>4</sup>

- It is a burden on health system and imposes strain on families.<sup>5</sup>
- Caesarean deliveries are associated with increased risk of maternal postpartum morbidity, higher chances of new-borns getting respiratory morbidity, less breast feeding causing a possibly more atopic disease.<sup>6</sup>
- There are increased chances of abnormal placentation in future pregnancy with previous caesarean section.<sup>6,7</sup>

More than 85 percent of these operations are performed for four indications-prior caesarean delivery, dystocia,

foetal jeopardy, abnormal foetal presentation. The latter three compose the main indications for primary caesarean delivery.<sup>8</sup>

In order to understand the degree to which caesarean deliveries may be preventable, it is important to know why caesareans are performed. This study is aimed to find the rate of caesarean deliveries, various indications of the procedure and their relative contribution to the total CSR as well associated maternal morbidity and mortality. This is a step to find out indications of caesarean section which may help us to reduce the incidence rate in the institute in future.

**METHODS**

To observe the caesarean delivery rate and various indications contributing, the data was collected in a retrospective manner from all the deliveries that occurred during three-year period between 1<sup>st</sup> January 2016 to 31<sup>st</sup> December 2018 in the department of obstetrics and gynecology, in tertiary care hospital Pune (Maharashtra). Data on all live births were collected. In cases of caesarean sections their indications were recorded along with other demographic profile. Whether procedure was done as an emergency or it was a planned surgery. Previous obstetrics history and present obstetric parameters like antenatal care, gestational age, lie and presentation, number of fetuses, birth weight etc. were also recorded in the format and later entered in the Microsoft excel sheet.

The various categories of indications for caesarean sections included-foetal indications, maternal indications and obstetric indications.

Total, primary and repeat caesarean deliveries were calculated. The caesarean rate was calculated as the number of caesarean births in a year divided by total number of deliveries in that year.

The rate for each indication was calculated annually as the number of caesarean births performed for each indication per 1,000 live births.

**Statistical analysis**

The data so collected was presented with graphical representation. in tabular form with graphical representation. Statistical analysis was performed with SPSS software and t-test was used for continuous data and Pearson chi square test for discrete data.

**RESULTS**

There were total of 12373 deliveries during the study period, out of which rate of vaginal delivery was 8672 (70.08%) and rate of caesarean section was 3701 (29.91%) as shown in (Table 1).

Out of 3701 caesarean section 1070 (28.91%) were performed as elective caesarean section and 2631 (71.08%) as emergency procedure as shown in (Table 2).

**Table 1: Type of deliveries.**

	Vaginal delivery		Caesarean section		Total
	No. of cases (n)	Percentage	No. of cases (n)	Percentage	
2016	3287	70%	1407	30%	4694
2017	2944	69.87%	1269	30.12%	4213
2018	2441	70.42%	1025	29.57%	3466
<b>Total</b>	<b>8672</b>	<b>70.08%</b>	<b>3701</b>	<b>29.91%</b>	<b>12373</b>

**Table 2: Distribution of LSCS according to situation.**

	Elective		Emergency		Total
	No. of cases (n)	Percentage	No. of cases (n)	Percentage	
2016	421	29.92%	986	70.07%	1407
2017	378	29.78%	891	70.21%	1269
2018	271	26.43%	754	73.56%	1025
<b>Total</b>	<b>1070</b>	<b>28.91%</b>	<b>2631</b>	<b>71.08%</b>	<b>3701</b>

**Table 3: Type of caesarean section.**

Type of caesarean section	Number of cases(n)	Percentage
Primary caesarean section	2493	67.36%
Repeat caesarean section	1208	32.63%

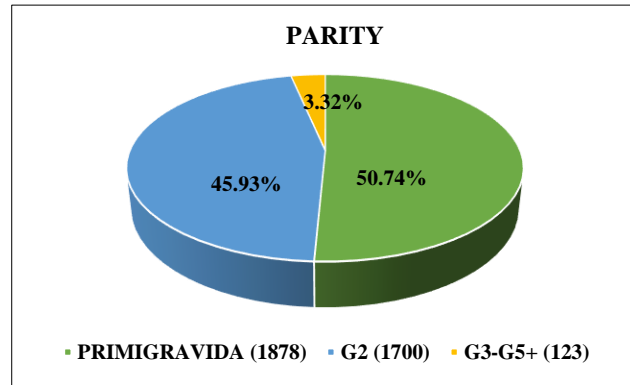
While considering for type of caesarean section patient who underwent primary LSCS were 2493 (67.36%) and repeat LSCS were 1208 (32.63%) as shown in (Table 3).

**Table 4: Demographic profile.**

Age group	No. of cases	Percentage
19-25 years	1196	32.31%
26-30 years	1669	45.09%
31-35 years	712	19.23%
> 35 years	124	3.35%

Table 4 represents the demographic profile of the patient which shows that 45.09% caesarean section were performed in the age group between 26-30 years counting for maximum no. this was followed by 32.31% between 19-25 years.

When parity is considered highest number was of primigravida - 1878 (50.74%), G2 were 1700 cases (45.93%) and G3 to G5+ were 123 (3.32%) cases (Figure 1).



**Figure 1: Parity.**

**Table 5: Distribution of caesarean section.**

Indication	2018		2017		2018		Total	
Previous LSCS	382	27.14%	408	32.15%	418	40.78%	1208	32.63%
Fetal distress	394	28%	373	29.39%	315	30.73%	1082	29.23%
Oligo IUGR	77	5.47%	46	3.62%	32	3.12%	155	4.18%
CPD	163	11.58%	111	8.74%	33	3.21%	307	8.2%
Non progress of labour	87	6.18%	92	7.24%	45	4.39%	224	6.05%
Failure of induction	198	14.07%	135	10.63%	117	11.41%	450	12.15%
Breech	52	3.69%	48	3.78%	29	2.8%	129	3.48%
Transverse lie	16	1.13%	14	1.10%	9	0.87%	39	1%
Unstable lie	10	0.71%	8	0.63%	6	0.58%	24	0.64%
Cord prolapse	7	0.49%	7	0.55%	2	0.19%	16	0.43%
Placenta previa	8	0.56%	17	1.33%	6	0.58%	31	0.8%
Severe abruptio placenta	13	0.92%	6	0.47%	10	0.97%	29	0.78%
Genital warts	-	-	4	0.31%	-	-	4	0.10%
Cesarean section on demand	-	-	-	-	3	0.29%	3	0.081%

**Table 6: Indication of repeat caesarean section.**

	2016		2017		2018		Total	
Previous 2 LSCS	66	17.27%	41	10.04%	36	8.61%	143	11.83%
Scar tenderness	93	24.34%	75	18.38%	110	26.31%	278	23.01%
Short inter pregnancy interval	33	8.63%	72	17.64%	61	14.59%	166	13.74%
Not willing for VBAC	56	14.65%	69	16.91%	127	30.38%	252	20.86%
Previous LSCS with fetal distress	68	17.80%	92	22.54%	52	12.44%	212	17.54%
Previous LSCS with CPD	76	19.89%	50	12.25%	31	7.41%	157	12.99%
<b>Total</b>	<b>392</b>		<b>399</b>		<b>417</b>		<b>1208</b>	

According to our study the most frequent indication for caesarean section was previous LSCS (Lower segment caesarean section) 32.63%, followed by foetal distress 29.23%, add failure of induction 12.15%, a cephalopelvic disproportion 6.4%, non-progress of labour 6.05% (Table

5). Commonest cause of repeat caesarean section in our study was Scar tenderness (23.01%) followed by not willing for VBAC (vaginal birth after caesarean section) (20.86%) and foetal distress (17.54%) (Table 6).

## DISCUSSION

Today the excessive use of caesarean section is a serious problem worldwide. In the last decades it has been an increase in the caesarean section practice. The increased number of caesarean section realized is a multifactorial problem, concerning the institutional practices, the physician, social women characteristics and their environment, avoiding difficult manipulative or instrumental vaginal deliveries, foetal distress detected especially with the use of continuous electronic foetal monitoring caesarean section has high rates in condition like Breech presentation, previous caesarean delivery,

growth restricted foetus, multiple pregnancy, Improved safety of caesarean section with better surgical techniques, anaesthesia, better availability of blood and its products, advanced antibiotics, and off course fear of labour pains.

### *Demographic profile*

Analysis of age of the patients showed that 45.09% of cases were in the age group of maximum fertility i.e. between 26-30 years. Similar results were found in studies conducted by Jawa A et al, Preetkamal et al, Yadav S et al, Saxena N et al and Sarma P et al.

**Table 7: Comparative studies.**

Study	Place	Study period	CSR %
Present study	Pune, Maharashtra	January 2016-December 2018	29.91
Subhashini R et al	Visakhapatnam, Andhra Pradesh	January 2014-December 2014	25.66
Yadav RG	Vadodara, Gujarat	January 2013-December 2013	28.87
Mittal S et al	Mumbai, Maharashtra	January 2011-December 2011	28.93
Jawa A et al	Jaipur, Rajasthan	December 2015-May 2016	31.80
Saxena N et al	Dehradun, Uttarakhand	January 2015-December 2015	31.40
Sarma P et al	Sonitpur, Assam	January 2015-December 2015	27.60
Nikhil A et al	Sola, Gujarat	June 2013-December 2013	25.18
Padmaleela K et al	Andhra Pradesh	April 2011-March 2012	31.00
Bhasin SK et al	East Delhi, India	September 2003-May 2004	34.40
Kambo I et al	30 medical colleges/teaching hospitals in India	1998-1999	25.40

### *The caesarean section indications*

In the present study, the most common indication was previous caesarean section (32.63%). Similar results were found in studies conducted by Singh G et al, Jiwa A et al, Chavda D et al, Nikhil A et al, Bade P et al and Balci O et al. While not necessarily signaling causation, it is instructive to review events from this era, which may have influenced caesarean rates. In 2001, a similar paper and subsequent editorial describing the risk of uterine rupture in women exposed to vaginal prostaglandins undergoing VBAC suggested that elective repeat caesarean is the safer option when compared with VBAC.<sup>9,10</sup> Between 1998-2001, new national guidelines recommended that an anaesthesiologist should be available immediately in any hospital where VBAC is offered.<sup>11-13</sup> In 2003 and 2006, respectively, an ACOG bulletin and NIH consensus statement on elective caesarean per maternal request, suggested more patient autonomy regarding caesarean delivery, reflecting a change in national attitudes.<sup>14</sup>

No trial was given to patients with previous 2 or more sections, those who presented with scar tenderness, dealing with high risk pregnancy, in those previous

sections was done for pelvic abnormalities and in those women, who refused for vaginal delivery.

The second common indication in the present study was foetal distress (29.32%). The variability of foetal heart tracing interpretation has been documented and a lack of available foetal scalp blood sampling kits has further complicated the objectivity of foetal heart rate interpretation.<sup>15,16</sup> It is also possible that our effort to standardize foetal heart rate interpretation, as part of our comprehensive patient safety effort, had effects on this observation.<sup>17</sup> Standardization theoretically attempts to improve the objectivity of this test, however this study is unable to assess exactly what effect standardization had on the rise in this indication for caesarean. Also, this increase is possibly because of decrease in the difficult instrumental deliveries over a period.

Failed induction accounted for-12.15%; CPD and arrest of labour 8.2%, nonprogress of labour 6.05%, oligohydramnios/IUGR 4.18%; Breech-3.48%; rest in decreasing order were transverse lie, unstable lie, placenta previa, abruptio placenta, caesarean section on demand.

Why providers are more apt to perform caesareans for subjective and elective indications over recent years is a

complex issue. Medicolegal reasons, scheduling issues, economic pressures, provider- and patient-driven medicalization of birth, increased labour induction rates, and a broader perception of caesareans as safe have all been raised as possibilities. The role of medicolegal concerns has been documented with increasing caesarean rates as malpractice premiums and the number of litigated cases increase.<sup>18-20</sup> Patient preference also cannot be discounted in these trends. Decision to pursue a caesarean is not one made by the provider alone but one of shared decision making between provider and patient. Patient preferences and perception of risk do contribute, for instance, to decisions to attempt VBAC or vaginal delivery of multiple gestation. This does point out, however, that subjective phenomena may have influence even in seemingly objective criteria. Unfortunately, this analysis cannot account for the contribution of the patient's decision-making to changes in indications for caesarean.

In our study the observed Caesarean section rate was 29.91% which is almost the double that of given by WHO 10-15%. The caesarean section rate in Africa was 6.2% whereas in United Kingdom; the CSR was 24.1% of all live births.<sup>21,22</sup> Our study had similar results to that of studies as shown in (Table 7).

## CONCLUSION

In order to understand and improve the health care system 's response to increasing trend of caesarean section, consistent information regarding demographic data of women and their preferences to mode of delivery are important to be recorded at different type of health facility.

Vaginal birth is and will always be regarded as the superior mode of delivery compared to caesarean, simply because it has lesser morbidity and mortality involving both the mother and the child. As such, the obstetricians all over the world must encourage vaginal delivery as far as possible. So, focus should be placed on trial of more cases for VBAC and most importantly reducing primary caesarean section rate.

Greatest emphasis attached to foetal welfare in today's small family norm has changed the delivery practices in favour of caesarean section. There is no empirical evidence for an optimum percentage. What matters most is that all women who need caesarean sections receive them (WHO Statement 2010). Safe reduction of the rate of primary caesarean deliveries will require different approaches for each indication. Individualization of the indication and careful evaluation, following standardized guidelines, practice of evidenced-based obstetrics and audits in the institution, can help us limit CSR.

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