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Research Article

Changing trends in cesarean delivery: rate and indications

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ABSTRACT

Background: Caesarean section is a time honoured approach which was introduced in clinical practice as a lifesaving procedure both for the mother and the baby. The study was to compare the cesarean delivery rates over last 7 years and to examine the indications contributing to changed trends, if any.

Methods: To compare the rate and indications of cesarean delivery over last 7 years. Data were collected in a retrospective manner from all the deliveries that occurred between January 1 and December 31 in 2009, 2012, 2015, in the Department of Obstetrics and Gynaecology at Jhalawar Medical College, Jhalawar, Rajasthan, India. The rate and indications of primary and repeat cesarean sections were analyzed among the live births to estimate the relative contribution of each indication to the overall increase in rate. Repeat caesarean delivery rate increased from 24.66/1000 live births in 2009 to 46.56/1000 live births in 2015. FD, scar tenderness, NPOL mainly contributed to it.

Results: The cesarean delivery rate increased from 149.33/1000 live births in 2009 to 234.03/1000 live births in 2015, with an increase in primary cesarean delivery rate from 124.66/1000 live births in 2009 to 187.46/1000 live births in 2015. Fetal distress, non-progression of labor, obstetric indications contributed to this increase.

Conclusions: There is significant increase in the total cesarean rate with primary cesarean due to fetal distress accounting for most of the increase.

Keywords: Cesarean rate, Primary cesarean birth, Repeat cesarean birth, Indications

INTRODUCTION

As early as Munro Kerr wrote; "*I fear that today more than ever before, there is a danger of abdominal delivery being regarded as the legitimate method of dealing with each and every obstetrical abnormality*". Caesarean section is a time honoured approach which was introduced in clinical practice as a lifesaving procedure both for the mother and the baby. But currently, being described as the "caesarean birth epidemic" may now well be considered a true pandemic emerging issue in mother- child health care. Caesarean section is the most commonly performed surgical procedure in obstetrics. One of the most dramatic features of modern obstetrics is the increase in caesarean rate.^{1,2}

WHO advises that caesarean rate should not be more than 15% with evidence that CS rates above 15% are not associated with additional reduction in maternal and neonatal mortality and morbidity.^{3,4} There is an increase in trend in both primary and repeat caesarean rate. The reasons for the increase are multifaceted. FD especially its detection by intermittent auscultation of FHS or continuous electronic fetal heart rate monitoring, more liberal use of caesarean section for breech presentation, abdominal delivery of growth retarded baby, delay child bearing, increasing maternal body mass, multiple gestation, prematurity, improved safety of caesarean section are commonly cited causes.⁵ At present, there are no strictly defined protocols for the indication of CS in our country, so at present the decision of CS is mostly

individualized and depends on the obstetrician taking care of parturient.

METHODS

To compare the cesarean delivery rate over 7 years data were collected in a retrospective manner from all the delivery that occurred in 2009, 2012, 2015 for the interval between January 1 to December 31 in the Department of OBG, Jhalawar Medical College, Jhalawar, Rajasthan, India. Data on all live births were collected including type of delivery and indication was recorded, if cesarean section was performed. Total, primary and repeat cesarean section rate were calculated for each year. The cesarean rate was calculated as per 1000 live births. The rate for each indication was calculated annually as the number of cesarean births performed for each indication per 1000 live births.

The indications of CS included FD, multiple gestation, mal-presentation, NPOL, CPD, maternal indications, fetal indications, obstetric indications.

In our study category of maternal indications include condition predating the pregnancy that could complicate delivery like previous uterine surgery, diabetes, heart disease. Fetal indications include IUGR, cord prolapse and congenital malformation. Obstetric indication includes placenta previa, abruptio placentae, eclampsia, and impending eclampsia. Category of fetal distress includes FD during labor diagnosed by intermittent auscultation of FHS or electronic fetal heart rate monitoring.

RESULTS

A total of 5270, 6296, 9127 live births occurred in hospital in 2009, 2012, and 2015, respectively. Total 787, 1220, 2136 CSs were done in 2009, 2012, and 2015 respectively. The overall cesarean delivery rate increased from 2009 to 2012 to 2015. The average annual rate increased from 149.33/1000 live births (14.93%) in 2009 to 193.77/1000 live births (19.37%) in 2012 to 234.03/1000 live births (23.40%) in 2015. Both the primary and repeat cesarean delivery rates increased during this period (Table 1).

Table 1: Rate of cesarean section/1000 live births.

| CS | 2009 | 2012 | 2015 |
|------------|--------|--------|--------|
| Total CS | 149.33 | 193.77 | 234.03 |
| Primary CS | 124.66 | 153.90 | 187.46 |
| Repeat CS | 24.66 | 39.86 | 46.56 |

The primary cesarean delivery rate increased from 124.66/1000 live births (12.46%) in 2009 to 153.90/1000 live births (15.39) in 2012 to 187.46/1000 live births (18.74%) in 2015. The repeat cesarean delivery rate increased from 24.66/1000 live births (2.46%) in 2009 to 39.86/1000 live births (3.98%) in 2012 to 46.56/1000 live

births (4.65%) in 2015. Majority of increase in primary cesarean rate is due to increased incidence of FD, NPOL, obstetric indications (Table 2).

In the repeat cesarean sections, there was a rise mainly in cases with FD, scar tenderness, NPOL (Table 3). There was also increase in repeat CS due to previous 2 cesarean sections. There was also rising trend in repeat CS due to patient's refusal for vaginal birth after one previous CS.

Table 2: Relative contribution of indications to primary cesarean section rate/1000 live births.

| Indications | 2009 | 2012 | 2015 |
|-----------------------|-------|-------|-------|
| FD | 67.74 | 83.39 | 92.58 |
| NPOL | 15.18 | 19.06 | 24.10 |
| Mal-presentation | 18.97 | 23.03 | 26.30 |
| Multiple gestation | 3.60 | 3.65 | 4.38 |
| Obstetrics indication | 9.10 | 12.70 | 17.97 |
| Fetal indication | 5.69 | 7.31 | 10.30 |
| CPD | 3.98 | 4.13 | 10.96 |
| Maternal indication | 0.37 | 0.64 | 0.87 |

Table 3: Relative contribution of indications to repeat cesarean section rate/1000 live births.

| Indication | 2009 | 2012 | 2015 |
|--------------------------|------|-------|-------|
| Fetal distress | 7.59 | 14.29 | 16.43 |
| NPOL | 1.13 | 3.81 | 4.93 |
| Mal-presentation | 1.51 | 2.22 | 2.19 |
| Multiple gestation | 0.56 | 0.79 | 0.76 |
| Obstetric indication | 1.70 | 1.74 | 1.53 |
| fetal indication | 0.37 | 0.79 | 1.09 |
| Maternal indication | 0.18 | 0.15 | 0.21 |
| CPD | 3.79 | 5.40 | 6.13 |
| 2 pre-LSCS | 2.46 | 3.18 | 3.94 |
| Scar tenderness | 4.93 | 6.67 | 8.21 |
| Refusal of vaginal birth | 0.37 | 0.79 | 1.09 |

DISCUSSION

Today, there is concern over the rising cesarean delivery rates, in both developed and developing countries across the world.^{2,5} The rate of both primary and repeat cesarean delivery have been on the rise.⁶

Baber et al showed an increase from 26 to 36.5% between 2003 and 2009 and it changed from 10.6% in 1997 to 19.1% in 2006 in the case of Baaqeel.⁷ As per OECD Health data 2011, the CS rate in countries like Brazil, Mexico, and Turkey have exceed 40%. In India, more accelerated rise in CS rate was observed from 9 to 16% in less than decades between 1987 and 1997.⁸ Recently Saha et al reported a rate of 29% in 2007 in Kolkata.⁹ As in our study an increase in primary and repeat cesarean rates has been reported by Stavrou et al.¹⁰ The large contributor to primary cesarean delivery was

FD, similar to other reports.^{4,11,12} This is in contrast to finding of study in the Welsh population conducted by Chaudhary et al, where previous CS rather than fetal distress was the largest contributor.¹³ This variation could be because the fetal distress taken in their study was based on fetal blood sampling, while in our study, non-reassuring fetal heart pattern before and during labor was taken as a sign of fetal distress. Strengthening of staff, availability of round the clock nurse and doctor, better technology (CTG) have increased detection of fetal distress.¹⁴

For repeat cesareans, the number of case with previous 2 cesarean section has increased as with Chaudhary et al.¹³ There is an increase in number of cases with scar tenderness. These findings are similar to earlier reported studies.¹⁵

CONCLUSION

The rate of caesarean sections has increased from 2009 to 2015 with primary and repeat caesareans both showing an increase. In the primary caesarean sections rate, indications like FD, NPOL, obstetrics indications were responsible for an increase more than other indications. In the repeat caesarean sections FD, scar tenderness and NPOL than other indications contributed to increase in rate. Caesarean rate exert a burden on the health care expenditure of the government. While the benefits of the indicated caesarean delivery cannot be denied, unnecessary caesarean sections must be avoided. By implementing protocol and evidence based medicine, we can balance the rate of CS and can judiciously use the proper indication for the case.

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