



ISSN 2278 – 0211 (Online)

## Trends and Rates of Caesarean Sections: Seven Year Study in Mangalore

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### **Abstract:**

*Introduction-Caesarean section is among the most commonly performed major surgical procedures worldwide. In countries where basic obstetric care is lacking, the rate of caesarean section and maternal and neonatal mortality and morbidity bear an inverse relationship to each other. However, if performed without appropriate indication, this operative intervention has a proven derogatory effect on maternal and child health. This study aims to determine the trend of operative childbirth in a Government referral centre in Mangalore, India over the recent past.*

*Methods-In this retrospective study, anonymous hospital data, collected from hospital delivery registers, between 2007 and 2013 from a Government hospital in Mangalore was analysed.*

*Results-35,480 deliveries were conducted in the hospital between 2007 -2013. Of these, 11,051 (31.1%) were caesarean sections. Over time, the total number of hospital deliveries per year was fairly constant. However, yearly analysis showed a rise in the caesarean section rates from 28.2% in 2007 to 38.7% in 2013. Subgroup analysis between 2007 and 2011 showed that the proportion of elective(28.1%) and emergency(71.9%) caesareans remained more or less constant.*

*Conclusion-Our study has shown an increase in the caesarean section rate over the years with the proportion of elective and emergency caesarean sections remaining constant. In spite of obvious limitations of a database study, the inferences obtained provide an incentive to conduct further in depth research. As the rising rates are a clinical and administrative concern, hospital-initiated programmes should be planned and effectively executed to bring about a safe reduction in these rates.*

**Keywords:** Caesarean Sections, Trends, Rates, Mangalore

### **1. Introduction**

Caesarean section is among the most commonly performed major surgical procedures worldwide<sup>1</sup>. The rates of delivery of the baby by the abdominal route has been on the rise and this has been attributed to a large number of factors.

It has been observed that in those countries where basic obstetric care is lacking, the rate of caesarean section and maternal and neonatal mortality and morbidity bear an inverse relationship to each other<sup>2</sup>. However, if performed more often without proper indication, this operative intervention affords no additional benefit to either. Moreover, a derogatory effect on maternal and child health has been observed in some places.<sup>3</sup>

The WHO recommends that the rate of caesarean sections necessary to avoid maternal mortality and morbidity should be set between 1-5% and that for neonatal mortality and morbidity should be about 10%.<sup>3-4</sup>

In India, an average caesarean section rate of 8.5% has been noted for the year 2008<sup>3</sup> and this rate has been on the rise in the recent past for a multitude of reasons.

This study aims to determine the trend of operative childbirth in a government referral center in Mangalore, India over the recent past.

## 2. Methods

- *Study design:*The study is a retrospective hospital database study .
- *Setting:* Government Lady GoschenHospital,Mangalore
- *Methods:*All the deliveries that are conducted in the hospital are entered into the hospital delivery registers.The patient details and mode of delivery are recorded by the person conducting the delivery itself and then information thus obtained was used to compile an anonymous database of patients undergoing normal deliveries and caesarean sections during the period 2007-2013.These delivery registers are a reliable and valuable source of information regarding the patient outcome. A number of previous studies have used hospital data in this way.
- *Data Analysis.*We compared the number of deliveries and caesarean sections in a government hospital in Mangalore, India, between 1/1/2007 and 31/3/2013.Analysis of the elective and emergency caesarean sections over five years (2007-2011) was done per month in a smaller group.

## 3. Results

In the period 2007-2013, a total of 35,480 deliveries were conducted at Government Lady Goschen hospital in Mangalore, India. Of these 35,480 deliveries, 11,051 were caesarean sections and the rest were vaginal deliveries. Thus,over the time that the data was analyzed, caesarean sections comprised 31.1% of all the deliveries.

It has been noted that the total number of deliveries in the hospital per year during the study period was fairly constant.However,yearly analysis showed a rise in the caesarean section rates in the hospital from 28.2% in 2007 to 38.7% in 2013. This increase in the rate has been more pronounced in the last 3 yearsstudied (Table 1).

A subgroup analysis was done using the data obtained from the year 2007-2011.The type of caesarean sections were noted in terms of them being elective or emergency.Overall,the percentage of elective cesareans was found to be 28.1% while emergency cesareans comprised 71.9% .Over the years not much change has been noted over the proportion of the elective and emergency caesareans performed (Table 1)

	2007	2008	2009	2010	2011	2012	2013	Total
Deliveries	5256 (14.8)	6326 (17.8)	5815 (16.4)	5454 (15.4)	5440 (15.3)	5414 (15.3)	1775 (5.0)	35480 (100.0)
Caesareans	1482 (28.1)	1740 (27.5)	1759 (30.2)	1915 (35.1)	1838 (33.8)	1636 (30.2)	681 (38.3)	11051 (31.1)
Elective Caesareans	400 (26.9)	508 (29.2)	585 (33.3)	508 (26.5)	451 (24.5)	N/A	N/A	2452 (28.1)
Emergency Caesareans	1082 (73.1)	1232 (70.8)	1174 (66.7)	1407 (73.5)	1387 (75.5)	N/A	N/A	6282 (71.9)

Table 1: Total number of Deliveries and Caesarean Sections in Government Lady Goschen Hospital, Mangalore, 2007-2013

## 4. Discussion

Caesarean sections were performed during ancient times in order to rescue the fetus in a dying woman. <sup>5</sup> This indication had not changed for several years until the nineteenth century when advances in anesthetic and surgical techniques have made the procedure a lot safer for the mother.

This procedure had then gained popularity in an attempt to improve the perinatal outcome and maternal mortality. However in the recent past,delivery by caesarean section has been on the rise and may be unnecessarily so to a certain extent.

In case of a women with an uncomplicated pregnancy, although a planned caesarean may reduce the risk of vaginal injury,perineal and abdominal pain intrapartum and for three days post partum<sup>6</sup>, they are at a higher risk(almost double)for other severe forms of morbidity and mortality. There has been an increased risk of post partuminfection, need for blood transfusions and hysterectomies and a higher rate of admissions into the Intensive care units following operative interventions.<sup>7</sup>An increase in the need for admissions into the neonatal intensive care units has also been observed for those babies delivered by caesarean.<sup>6</sup>

It has been observed that there is an increased chance of unexplained still birth in the second pregnancy if the first child was delivered by caesarean section.<sup>8</sup>A moderate increase in the risk of uterine rupture has also been noted as along term effect of a previous caesarean<sup>9</sup>among other complications.

Hence the rise in the rates of caesareans may not necessarily mean additional benefit for the mother or her child but on the contrary may increase the rates of mortality and morbidity in both.A varied number of reasons have contributed to the rise in the caesarean section rate in our study.Some of the factors which play a role in this increased rate more so in our setup are being discussed.

In the study, a retrospective analysis was done on data collected over the years 2007-2013. There were 35,480 deliveries with 11,051 caesarean sections (31.1%) in the hospital over this time period. The total number of hospital deliveries has remained fairly constant. An yearly analysis of the rates of caesarean sections in the hospital revealed an increase in the percentage of the total caesarean sections from 28.2% in 2007 to 38.7% in 2013. This rise was more marked in the last 3 years. This rise may be attributed to a number of factors..A dominant factor in determining if a caesarean is needed for a particular patient is her age.<sup>10</sup>Higher rates of operative intervention have been noted in cases of advanced maternal age <sup>11</sup>.Elderly primigravidas are not being given a trial for vaginal delivery

and are delivered electively by caesarean section in a number of institutes. This trend is on the rise in recent times as the maternal age is rising in our population.

Contrary to popular beliefs that elective caesareans pose a very minimal risk to a healthy mother, it has been seen that a vaginal delivery is a far safer mode of delivery.<sup>12</sup> This has to be kept in mind by the obstetrician while planning and counseling the patient for an elective caesarean.

With the development of electronic fetal monitoring to detect fetal distress during delivery, a rise in the emergency caesarean rate has been noted. This is more common in situations where fetal blood sampling to detect fetal hypoxia is not available. Monitoring fetal heart by this method has a very high false positive rate and does not reduce fetal mortality and morbidity and cerebral palsy rates.<sup>13</sup> Intrapartum admission Cardiotocography in low risk woman has also contributed to the rise in operative intervention.<sup>14</sup>

Elective caesarean for breech presentation on the other hand has shown a lower rate of severe maternal complications such as operative wound infections, puerperal fever, haemorrhage and fourth degree perineal tears.<sup>15</sup>

Following a previous caesarean, it was seen that the overall adverse effects associated with a repeat caesarean delivery and a trial of labour were quite rare. As such a trial for vaginal delivery may be a reasonable choice for most patients with a previous caesarean in an attempt to control the rate of operative intervention.<sup>16,17</sup> Most patients in our hospital with a previous caesarean tend to undergo a repeat caesarean which contributes to a large proportion of the total operated cases.

It has also been observed that elective inductions in nullipara lead to an increased number of unplanned caesareans and also an increase in the postpartum complications in both nulliparous and multiparous women.<sup>18</sup> However due to an increase in the incidence of scar rupture induction in a patient following a previous caesarean has not been recommended in a few studies.<sup>19</sup> These above factors have contributed largely to the rise in the caesarean section rates in our setup.

A sub-group analysis performed from year 2007-2011 showed that the emergency caesareans were considerably higher in the hospital (71.9%) in comparison to the number of elective caesareans. The proportion of these emergency caesareans more or less remained the same over the years. As the hospital is a referral centre, with a functioning operating theatre and a blood bank, the high risk cases being referred here usually require surgical intervention and might contribute to the high emergency caesarean rate. Patients also tend to report late to the hospital, only once a complication arises, which is another contributing factor. This leaves little choice to the obstetrician but to intervene surgically on an emergency basis.

A caesarean section is more expensive than a vaginal delivery.<sup>20</sup> As the procedures are funded by the government in our setup, this increase in expenditure translates to a reduction in the government funds to tackle other essential medical problems in those populations that are unable to afford even basic medical care.

## 5. Conclusion

A rise in the caesarean section rate, especially emergency caesareans, has been observed due to a multitude of reasons. Although our study is a database study, which entails certain limitations, the collected data and the inferences obtained provide incentive to conduct studies in greater depth in this aspect. As the rising caesarean section rate has become a matter of concern to the treating doctors and administrative staff alike, an effort has to be made to look into the various factors leading to this. Hospital-initiated programs if effectively planned and executed may successfully bring about a safe reduction in the caesarean section rate.<sup>21</sup>

## 6. Disclosures of Interest

None to declare

## 7. Contribution to Authorship

- NL – Data acquisition, Literature review, Editing and writing up
- VMR – Edited draft, senior author
- AAR – Edited draft, senior author
- DL – Design, Analysis, Literature review, Editing and writing up
- RP – Design, Analysis, Editing

## 8. Funding

No funding was required for this study

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