CAESAREAN SECTION THE RISING TREND: A RETROSPECTIVE STUDYShivaji Neelgund¹, Hiremath P. B²¹Department of Obstetrics and Gynaecology, SVMCH & RC, Ariyur, Pondicherry.²Department of Obstetrics and Gynaecology, SVMCH & RC, Ariyur, Pondicherry.**ABSTRACT****BACKGROUND**

The incidence of Caesarean delivery has risen alarmingly in both high income countries like Australia and USA and also in low income countries like Latin America and Asia. The objective of this, study is to analyse the factors affecting the rising trend of Caesarean Delivery and to critically derive at measures that can be taken to reduce this rising trend.

METHODS

This is a retrospective study conducted in the Department of Obstetrics and Gynaecology at SVMCH and RC, Ariyur, Pondicherry, of 1337 patients who underwent Caesarean Delivery between 2011 and 2013.

RESULTS

In our study, the incidence of Caesarean Delivery was 26.28%, 1337 cases out of total 5880 deliveries. Out of these, Primary Caesarean Delivery was 44.58% [596 cases] and Previous Caesarean Delivery was 55.42% [741 cases]. The incidence of elective CS was 11.29% and emergency CS was 88.63%.

CONCLUSIONS

By a well-defined protocol, promoting institutional deliveries, proper monitoring of maternal and foetal parameters, encouraging deliveries by trial of VBAC and by proper counselling of the patients an optimal CS rate can be achieved.

KEYWORDS

Caesarean Delivery, Indications, Foetal Distress, Previous Caesarean, VBAC.

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INTRODUCTION

Caesarean delivery which has significantly reduced Maternal and Neonatal Mortality, both in the developed and developing countries is now being labelled as the latest example of medicalization due to its rising incidence.¹ The incidence of Caesarean delivery has risen alarmingly in both high income countries like Australia and USA and also in low income countries like Latin America and Asia.^{2,3} The WHO, 1994 has revised its guidelines - beyond a rate of 5-15%, CS [caesarean section] has no additional benefits to the mother or the neonate. The optimal rate is not known. The world regions can set at 5%-15% or set their own standard, WHO - 2009.

The reasons for the increased rate of CS are not clear. Studies point to medical explanations for the safety of the mother and child in presence of obstetric complications.³ The non-medical explanations are preference of women who are taking informed decisions, institutional births demographic profiles of mothers, litigation problems, insurance facilities, private health care system, maternal request and personal society reason - fear of labour pain.^{4,2}

Mishra and Ramanathan reported in 2002 that the CS rate was 15% in two states and less in others.³ Pahari and Gosh - 1997 reported that in a teaching hospital in Kolkata, between

1990 - 1995, the CS rate was 50%.⁵ Kambo et al reported in 2002 that in 30 medical colleges, the CS rate had increased from 21.8% from 1993-94 to 25.4% from 1998-99.⁶ Sreevidya and Sathyasekaran in 2003 reported that in Chennai between June 1997 and May 1999, the CS rate was 32.6%.⁷ The least CS rate by DLHS 2007-09, NFHS was 4.5% in Jharkhand and Bihar. However, Maternal and Neonatal mortality was high in this region due to lack of emergency obstetric care.

AIMS AND OBJECTIVES

This is a retrospective study conducted at SVMCH and RC, Ariyur, Pondicherry, of 1337 patients who underwent Caesarean Delivery between 2011 and 2013. The objective of the study is to analyse the factors affecting the rising trend of Caesarean Delivery and aim to critically derive at measures that can be taken to reduce this rising trend.

MATERIAL AND METHODS

This is a retrospective study carried out in the Department of Obstetrics and Gynaecology, SVMCH and RC, with the aim to analyse the changing trend in the indications for caesarean section. There were 1337 cases of CS. Patients included both registered and emergency cases. Demographic details of the patient were recorded including age, stature, parity, address, socioeconomic status. Patients were evaluated by recording their detailed personal and medical history, present and past obstetrics history and general and obstetric examination findings. Laboratory investigations, foetal ultrasound findings were studied. Labour progression notes, the partogram recordings and the foetal electronic monitoring recordings were critically analysed.

Indications of caesarean section was carefully scrutinized. If more than one indication was present, the highest risk factor

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Corresponding Author:

Dr. Shivaji Neelgund,

Department of Obstetrics and Gynaecology,

SVMCH & RC, Ariyur,

Pondicherry-605102.

E-mail: shivajineelgund5@gmail.com

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was considered. Maternal and neonatal outcome were noted, specifically the birth weight and Apgar score. Blood transfusion if given was recorded with its indication.

RESULTS

In our study, the incidence of Caesarean Delivery was 26.28% - 1337 cases of CS out of total 5880 deliveries. Out of these, Primary Caesarean Delivery was 44.58% [596 cases] and Previous Caesarean Delivery was 55.42% [741 cases], Table No. 1. The incidence of elective CS was 11.29% and emergency CS was 88.63%, Table No. 2. The registered cases were 575 [43%] and Emergency cases were 762 [57%] Table No. 3. The indications for CS are shown in Table No. 4 - Previous caesarean 55.42% followed by Foetal Distress 16%. The maternal indications in descending order are - Previous CS, NPOL [No Progress of Labour], CPD [Cephalopelvic Disproportion], Toxaemia, APH [Antepartum Haemorrhage] and Medical disorders in pregnancy, whereas the Foetal indications in descending order are - Foetal distress, PROM [Premature Rupture of Membranes], severe oligohydramnios, Breech presentation, Twin pregnancy and Post-dated pregnancy. In the previous CS group the leading indication was Foetal distress followed by Scar tenderness, Failure of induction, NPOL, Meconium stained liquor, Oligohydramnios, Toxaemia, Breech presentation and APH, [Table No. 5]. The maximum number of CS were in the age group of 21-35 yrs. Maximum number of previous CS, which were taken up for repeat CS were in the age group 31- 35 yrs. 36.59%, [Table No. 6].

Indications	No. of Cases	%
Primary Caesarean	596	44.58
Previous Caesarean	741	55.42
Total	1337	100

Table 1: Data of Primary and Previous Caesarean Delivery

Indications	No. of Cases	%
Elective CS	152	11.37
Emergency CS	1185	88.63
Total	1337	100

Table 2: Data of Elective and Emergency CS

Type of Cases	No. of Cases	%
Registered cases	575	43
Emergency admission cases	762	57
Total	1337	100

Table 3: Data of Registered and Emergency Cases

Indications	No. of Cases	%
Previous Caesarean Delivery	741	55.42
Foetal Distress	214	16.00
No Progress of Labour	83	6.21
Premature Rupture of Membranes	67	5.01
Sever Oligohydramnios	52	3.89
Cephalo-Pelvic Disproportion	47	3.52
Malpresentation/Breech Presentation	39	2.92
Severe Pre-Eclampsia	34	2.55
Ante-Partum Haemorrhage	27	2.02
Multiple Pregnancies	15	1.12
Post-dated Pregnancy	10	0.75
Medical Indications	8	0.59
Total	1337	100

Table 4: Indications of Caesarean Delivery

Indications	No. of Cases	%
Foetal Distress in Previous CS	108	14.57
Scar Tenderness in Previous CS	103	13.90
Failed Induction in Previous CS	96	12.96
Non-Progress of Labour In Previous CS	79	10.66
Meconium Stained Liquor in Previous CS	78	10.53
Oligohydramnios in Previous CS	71	9.58
CPD in Previous CS	70	9.45
Severe Pre-Eclampsia in Previous CS	52	7.02
Breech Presentation in Previous CS	45	6.07
Ante-Partum Haemorrhage in Previous CS	39	5.26
Total	741	100

Table 5: Indications in Previous Caesarean

Age in Years	No. of Cases	%
16-20 years	175	13.09
21-25 years	254	18.99
26-30 years	302	22.59
31-35 years	389	29.09
36-40 years	217	16.24
Total	1337	100

Table 6: Age Wise Distribution of Caesarean Delivery

DISCUSSION

The incidence of Caesarean Delivery in our study is 26.28%. Similar incidence is reported from Raipur, 26.2%.⁸ A similar incidence was also reported from Indonesia 29.6%.⁹ and from Nepal 28.6%.¹⁰ There is a global rise of CS - 25% to 30% in both developed as well as developing countries as reported by Leitch C R Walters.¹¹ This rise in the incidence of CS is due to indications, which are based on interventions by biomedical technologies such as Fetal electronic monitoring and Ultrasonography. There is an increase in labour induction and USG detection of IUGR, multiple gestation, severe oligohydramnios. In high risk obstetric population, caesarean delivery is indicated to avoid the continuation of pregnancy or the onset or the continuation of labour in the interests of the mother and fetus. Availability of well-equipped medical set-ups with skilled personnel such as neonatal intensive care units, blood-bank facilities, privatization of medical practice and availability of health insurance, medicolegal issues and governmental pressure of safe delivery are the factors responsible for doctor's preference for this surgical procedure.

This higher rate is also due to lower rate of instrumental vaginal delivery, higher CS rate in breech presentation and low rate of vaginal birth after caesarean delivery. In this modern era indications for caesarean section are constantly changing, influenced by the population served, availability of well-equipped medical set-ups and clinical skills. Growing CS trend is also due to increased demand by patient's families or maternal request following conception after treatment for infertility and precious pregnancies.¹²

The World Health Organization in June 2010 has altered its previous 5-15% CS rates and has stated - as there is no empirical evidence for an optimum percentage, what matters most is that all women who need caesarean sections receive them. Goals for achieving an optimal Caesarean delivery rate should be based on maximizing the best possible maternal and

neonatal outcomes, taking into account available medical and health resources and maternal preferences.

SVMCH and RC is a rural referral centre and the CS incidence of 26.2% is partially due to the referred cases, which have been sent for CS. This is seen in the high rate of emergency admissions and emergency CS.

In our study, the leading indication of CS is previous CS 55.4%. Similar incidence is being reported from USA.¹³ China.¹⁴ and in South India.¹⁵ A primary CS puts the next pregnancy in an increased risk of repeat CS. In previous CS cases, the risks of maternal and fetal injuries during operative vaginal delivery, increased risk of rupture uterus and atonic post-partum haemorrhage in a long trial of vaginal delivery are the reasons obstetricians prefer a repeat CS and avoid or give a very short trial of VBAC [Vaginal birth after CS]. This leads to an increase in the CS rates, in previous CS and also in moderate-to-high risk pregnancies.¹⁶ McMohan et al reported an increase in the maternal and fetal morbidity in VBAC compared to repeat CS.¹⁷ whereas Gonen et al reported VBAC with well-defined protocol to be safer than repeat CS.¹⁸ Guise et al also reported VBAC safer.¹⁹

A previous CS may have added co-morbidities, which increases the incidence of repeat CS.²⁰ Improved surgical techniques, availability of broad-spectrum antibiotics, blood transfusion facilities, intensive care units have made CS a safe procedure and there are maternal demands for CS of 23 to 38.9%, which has increased the incidence of CS.²¹ It is reported that VBAC trials with proper selection criteria and proper monitoring protocols can help in reducing the rate of CS.^{18,19}

In our study the second largest contributor to the primary CS rate was foetal distress, 16% similar to other reports.^{22,23,24} Even in the previous CS group in our study the leading indication for repeat CS is foetal distress, 14.57%. In our study, foetal distress was diagnosed by foetal monitoring - Cardiotocography [CTG]. CTG usually overestimates fetal distress, because many gestational and antepartum factors influence the foetal response in the CTG. The accurate method of estimation of foetal distress is by foetal scalp pH estimation.¹⁵ Majority of the cases of foetal distress had poor Bishop Score 124 cases [57.9%] and meconium stained liquor in our study. Twenty one cases had cord around the neck. In 58 [27.1%] cases the Apgar score was 7-8 at birth and at 5 minutes, which suggests more careful diagnosis of foetal distress may help to reduce the incidence of CS.

NPOL [Non-Progress of Labour] was 6.21%, which was due to failure of induction of labour and minor degree of Cephalopelvic Disproportion [CPD]. The incidence of PROM [Premature Rupture of Membranes] in our study was 5.01%. Monitoring with partograph and timely judicious use of oxytocics will help to reduce the rate of CS in these cases. The incidence of CPD in our study is 3.52%.

There were 52 cases [3.89%] of severe oligohydramnios in our study with amniotic fluid index less than 5, most of these had poor Bishop score and were taken up for CS. An amniotic fluid index less than 5 usually leads to foetal compromise due to cord compression.

The incidence of Breech presentation, as an indication of CS, in our study is 2.92% [39 cases]. The babies were big, macrosomia 28 cases, footling in 7 cases and 4 of the patients had Pre-Eclamptic Toxaemia [PET] all were delivered by CS. As reported by Hannah et al, perinatal mortality and neonatal morbidity are significantly reduced by CS.²⁵ The 34 cases of

Toxaemia were delivered by CS, as they had aggravating PET and changes were found in foetal Doppler studies. Antepartum haemorrhage cases were 27, of which 16 were placenta previa and 11 were abruption placenta. Considering maternal and foetal well-being, all were delivered by CS. There were 15 cases of twins, of which 12 had first baby in Breech presentation and 3 were preterm; therefore, all were delivered by CS. The 10 cases of post-dated pregnancies were delivered by CS. There were 8 cases of medical disorders complicating pregnancy. Gestational diabetic patients were 6, of these 3 had big babies, 3 had conceived after treatment for infertility. Two others cases had bronchial asthma.

Among the previous CS, the main indication was by Fetal distress [14.57%] followed scar tenderness [13.90%] and failed induction of labour [12.96%]. Maximum number of CS was in the age group of 21 to 35 years. The peak incidence was in the age group of 31 to 35 years.

CONCLUSION

There is a worldwide increase in caesarean section due to various reasons and indications. Maternal and foetal welfare is very important in today's small family norm. This attitude has led to the emergence of a new set of indications in adopting CS as a preferred mode of delivery in moderate-to-high risk pregnancies and avoid difficult, manipulative, instrumental vaginal deliveries. This attitude lies in both – today's obstetric population and the medical personnel. Rising rates of Caesarean section are also due to the frequent diagnosis of foetal distress on electronic heart rate monitoring. By a well-defined protocol promoting institutional deliveries, proper monitoring of maternal and fetal parameters, encouraging deliveries by trial of VBAC and by proper counselling of the patients an optimal CS rate can be achieved.

REFERENCES

1. Mukerji SN. Rising caesarean section rate. *J Obstet Gynaecol India* 2006;56(4):298-300.
2. Potter JE, Berquo E, Perpetuo I, et al. Unwanted caesarean sections among public and private patients in Brazil: prospective study. *British Medical Journal* 2001;323 (7322):1155-58.
3. Mishra US, Ramanathan. Delivery related complications and determinants of caesarean section rates in India *Health Policy and Planning* 2002;17(1):90-98.
4. Hopkins K. Are Brazilian women really choosing to deliver by caesarean? *Social Science and Medicine* 2000;51(5):725-40.
5. Pahari K, Ghosh A. Study of pregnancy outcome over a period of five years in a post-graduate institute of West Bengal. *J Indian Med Assoc* 1997;95(6):172-74.
6. Kambo I, Bedi N, Dhillon BS, et al. A critical appraisal of caesarean section rates at teaching hospitals in India. *Int J Gynaecol and Obstet* 2002;79(2):151-58.
7. Sreevidya S, Sathiyasekaran BWC. High caesarean rates in Madras (India): a population-based cross-sectional study. *BJOG: an International Journal of Gynaecology and Obstetrics* 2003;110(2):106-11.
8. Singh Abha, Channawar Reema. A recent way of evaluating caesarean birth. *J Obstet Gynaecol India* 2009;59(6):547-51.

9. Festin MR, Laopaiboon M, Pattanittum P, et al. Caesarean section in four south east Asian countries: reasons for, rates, associated care practices and health outcomes. *BMC Pregnancy and Childbirth* 2009;9:17.
10. Chhetri S, Singh U. Caesarean section: its rates and indications at a tertiary referral center in eastern Nepal. *Nepal Journal Online* 2011;9(3):179-83.
11. Leitch CR, Walkers JJ. Caesarean section rates. Evaluate the reasons for surgery. *BMJ* 1994;308(6921):133-34.
12. Ghosh S. Increasing trend in caesarean section delivery in India: role of medicalisation of maternal health. In: Ghosh S, eds. *Working Paper 236*. Bangalore: The Institute for Social and Economic Change 2010:1-16.
13. Emma L, Lisbet L, Kathleen B, et al. Contributing indications to the rising caesarean delivery rate. *Obstet Gynaecol* 2011;118(1):29-38.
14. Wang CP, Tan WC, Kanagalingam D, et al. Why we do ceasears: a comparison of trends in caesarean section delivery over a decade. *Ann Acad Med Singapore* 2013;42(8):408-12.
15. Unnikrishnan B, Rakshith P, Aishwarya A, et al. Indications for caesarean section in a tertiary care obstetric hospital in coastal south India. *Australasian Medical Journal* 2010;3(12):821-25.
16. Mehta A, Apers L, Verstraelen H, et al. Trends in caesarean section rates at a maternity hospital in Mumbai, India. *J Health Popul Nutr* 2001;19(4):306-12.
17. McMahon MJ, Luther ER, Bowes WA, et al. Comparison of a trial of labor with an elective second caesarean section. *N England J Med* 1996;335(10):689-95.
18. Gonen R, Tamir A, Degani S, et al. Variables associated with successful vaginal birth after one caesarean section: a proposed vaginal birth after caesarean section score. *Am J Perinatol* 2004;21(8):447-53.
19. Guise JM, Eden K, Emeis C, et al. Vaginal birth after caesarean: new insights. *Evidence Report/ Technology Assessment Journal* 2010;191:1-397.
20. Feng XL, Xu L, Guo Y, et al. Factors influencing rising caesarean section rates in China. *Bull WHO* 2012;90:30A-9A.
21. Wilkinson C, McIlwaine G, Boulton-Jones C, et al. Is a rising caesarean section rate inevitable? *Br J Obstet Gynaecol* 1998;105(1):45-52.
22. Liu S, Rusen ID, Joseph KS. Trends in caesarean delivery rates and indications for caesarean. *J Obstet Gynaecol Can* 2004;26(8):735-45.
23. Krychowska A, Kosinska K, KarwanPlonnska A. Comparison of indications for caesarean section in 1985-86 and 2000-01: analysis of changes. *Ginekol Pol* 2004;75(12):926-31.
24. Barber EL, Lundsberg LS, Belanger K, et al. Indications contributing to the increasing caesarean delivery rate. *Obstet Gynaecol* 2011;118(1):29-38.
25. Hannah ME, Hannah WJ, Hewson SA, et al. Planned caesarean section versus planned vaginal birth for breech presentation at term: a randomised multicentre trial. *Term breech trial collaborative group. Lancet* 2000;356(9239):1375-83.