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Research Article

Indications and trends of caesarean birth delivery in the current practice scenario

Rina V. Patel¹, Ekta V. Gosalia², Kruti J. Deliwala¹, Punit B. Vasa¹, Viral M. Pandya^{1*}

¹Department of Obstetrics & Gynecology, Sheth V.S. General Hospital, Ahmedabad, Gujarat, India

²Department of Microbiology, Civil Hospital, Ahmedabad, Gujarat, India

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***Correspondence:**

Dr. Viral M. Pandya,

E-mail: drviralpandya@gmail.com

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ABSTRACT

Background: Objective of current study was to analyze incidence, indications and trends of cesarean birth delivery in our environment.

Methods: A prospective study of the cesarean sections performed at V.S. general teaching hospital in Ahmedabad from January 2008 to December 2013

Results: Out of 28,411 total deliveries, 11629 women underwent CS. Each year the CS rate, above 40%, was relatively constant. 72.46% patients were within 20-29 years of age group. 39% patients were from middle to higher socio-economic class. CS in emergency patient was consistently more than 50% and in registered patient around 40%. Maternal indications for CS were twice common to fetal indications. Previous CS and fetal distress were the commonest among maternal and fetal indications respectively. Overall maternal morbidity in CS ranged from 8-10%, commonest being blood transfusion and wound infection. Neonatal morbidity was less than half and neonatal mortality was almost one third in comparison to normal delivery. Rising CS trend was noted in patients with previous CS, fetal distress, oligohydramnios and failed induction. Gradual but constant decline in CS rate was noted among emergency patients, patient with CPD, obstructed labor and PROM.

Conclusions: Although to some extent higher CS rate is justifiable due to remarkable reduction in neonatal mortality and morbidity in high risk patients; the CS rate in our environment is still three times higher than WHO recommendation. In controlled environment with experienced staff, careful selection of patients for normal delivery among patients with previous CS, breech presentation and scientific induction of labor may satisfy our concern for mother and newborn safety while keeping the CS rate low.

Keywords: Caesarean delivery

INTRODUCTION

Caesarean section represents the most significant interventional operative procedure in all of obstetrics as well as the most commonly performed operation in the medical field.⁵ Its development and meaningful application has helped us to provide safe motherhood and improved quality of life of mother and newborn by avoiding serious delivery complications. But, regardless its documented success of lowering maternal and neonatal deaths significantly in the last century; it's

constantly rising use has become a global concern due to criticism over direct and avoidable maternal mortality and morbidity as well as questionable obstetricians' hierarchy to decide the mode of delivery.⁴ The WHO published guidelines (1985) suggested that in any circumstances, including different socio-demographic and medical conditions, caesarean birth rate should range from five to fifteen percent. And revised guidelines (1994) have argued that no additional benefit accrues to the newborns or the mothers when the rate exceeds this level. Many social activists and researchers have drawn

worldwide attention by setting the caesarean section delivery as the latest example of medicalization of the human body.⁸ Their fear can be understood by the fact that the caesarean section rate has risen in both developed and developing countries, all socio-economic classes, all ages, in different geographical areas as well as different clinical set-ups; making it one of the very few medical condition that holds medical, ethical, social and legal liability for providers, patients and the government.¹

Rising trend

From 1996 to 2007, the caesarean rate raised by 53%, reaching 32%, the highest rate ever in the United States^[3]. Every year, around 1.4 million caesarean births occur, and continuously growing, including women of all ages and infants of all gestational ages.⁴ Many states of India including Kerala (highest 25.74%), Pondicherry, Goa, Tamilnadu and Andhra Pradesh are above WHO guideline of 15%. For many developed countries, unequal distribution of health care service is a leading problem. More awareness and overuse among patients from higher socio-economic class and urban areas and limited access of basic and primary health care facilities to patients from poor socio-economic class and remote or rural areas, both are responsible for boosted rate of cesarean section.⁸ As more than half of normal deliveries are conducted at home without proper birth-records in rural areas, exact cesarean section rate is difficult to measure. National wide survey conducted by the NFHS revealed increased rate from 2.9% of the childbirth in 1992-93 to 7.1 in 1998-99 and further to 10.2 in 2005-06. This means a constant acceleration of annual 16.7% rate in caesarean delivery. But, one should note that in India, according to RCH-II survey, safe delivery is 47.6% based on availability of emergency obstetric care, ante-natal care and other paid medical services. A five-year audit from a teaching institute in Kolkata showed a caesarean section rate of 49.9%, in madras around 50%, in Mumbai around 42%, and so on.⁸

METHODS

This is a prospective study of 28411 deliveries, conducted in Sheth V.S. general hospital, obstetrics and gynecology department from January 2008 to December 2013. Patient population included both registered and emergency cases. All patients who underwent caesarean section were evaluated thoroughly by taking detailed personal and medical history, general and obstetric examinations, essential laboratory investigations, fetal ultrasound findings, labour progression and indications for caesarean section. When more than one indication was present, the highest priority diagnosis was assigned. Maternal and neonatal outcome, blood transfusion requirement were noted up to one month after delivery. Caesarean sections performed due to ruptured uterus were excluded in this study.

Aims and objectives

1. To study the incidence of caesarean birth
2. To identify different indications for caesarean section and their trend
3. To study neonatal and maternal outcome in terms of mortality and morbidity
4. To study demographic and socio-economic factors associated with CS birth
5. To justify the rational of increased rate and critically analyze the outcome so that we can make strategies to decrease the rate.

RESULTS

During the study period out of 28411 total deliveries, 11,629 women underwent CS. Each year the CS rate, above 40%, was relatively constant which is almost three times higher than WHO guidelines.

The mean age of patients was 24.6 years. 72.46% patients were within 20-29 years of age group. Considering parity, 58.23% patients were multiparous and 32.84% were nulliparous. The mean parity was 3.

Socioeconomically, 59% patients were poor, 29% from middle and 12% from higher class. We observe that majority of the patient from higher class were referred from private hospital due to high risk pregnancy management at tertiary care centre.

Each year registered to emergency patient ratio was around 9:1. CS in emergency patient was consistently more than 50% and in registered patient around 40% Maternal indications for CS ranged from 65-68%, whereas fetal indications ranged from 31-35%. Among maternal indications factors in decreasing order were previous CS, Cephalo-pelvic disproportion, failed induction, hypertensive disorders in pregnancy, obstructed labor, precious pregnancy, ante-partum hemorrhage and associated medical disorders in pregnancy.

Among fetal factors compelling CS in decreasing order were fetal distress, oligohydramnios, malpresentation, pre-mature rupture of membrane, macrosomia, multiple fetus and post-dated pregnancy.

Overall maternal morbidity in CS ranged from 8-10%. Leading causes included blood component transfusion, wound infection and resuturing, puerperal infection, obstetric hysterectomy and bowl-bladder injury.

Neonatal morbidity was less than half (6.555%) in comparison to ND (14.52%). Neonatal mortality was almost one third (0.98%) in comparison to ND (2.77%).

No significant change in trend noted in type of delivery, CS rate in overall and in registered patients, CS rate in hypertensive disorders in pregnancy. Also, no significant

change noted in different morbidity factors associated with CS. Rising CS trend over last six years was noted in patients with previous CS, fetal distress, oligohydramnios

and failed induction. Gradual but constant decline in CS rate was noted among emergency patients, patient with CPD, obstructed labor and PROM.

Table 1: Mode of delivery.

Year	2013		2012		2011		2010		2009		2008		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Total	4873	100	4700	100	4988	100	4933	100	4578	100	4339	100	
ND	ND	1075	22.06	985	20.96	1083	21.712	1134	22.988	1017	22.21	903	20.81
	Episiotomy	1429	29.32	1431	30.45	1637	32.819	1579	32.009	1284	28.05	1282	29.55
	PT, CT, VT	219	4.494	235	5	172	3.4483	234	4.7436	271	5.92	243	5.6
	Breech-ND	95	1.95	101	2.149	98	1.9647	75	1.5204	80	1.747	65	1.498
	Forceps	9	0.185	10	0.213	3	0.0601	7	0.1419	6	0.131	20	0.461
	Total	2827	58.01	2762	58.77	2993	60.004	3029	61.403	2658	58.06	2513	57.92
LSCS	LSCS-VX	1911	39.22	1812	38.55	1864	37.37	1769	35.861	1786	39.01	1713	39.48
	LSCS-BR	135	2.77	126	2.681	131	2.6263	135	2.7367	134	2.927	113	2.604
	Total	2046	41.99	1938	41.23	1995	39.996	1904	38.597	1920	41.94	1826	42.08

Table 2: Type of patients.

		2013		2012		2011		2010		2009		2008	
Mode of delivery	ND	2827	58.01	2762	58.77	2993	60	3029	61.4	2658	58.06	2513	57.9
	LSCS	2046	41.99	1938	41.23	1995	40	1904	38.6	1920	41.94	1826	42.1
	Total	4873	100	4700	100	4988	100	4933	100	4578	100	4339	100
Type of patients	Reg Pt	4372	89.72	4190	89.15	4396	88.13	4376	88.71	4025	87.92	3860	88.96
	EC Pt	501	10.28	510	10.85	592	11.87	557	11.29	553	12.08	479	11.04
	Total	4873	100	4700	100	4988	100	4933	100	4578	100	4339	100
Registered patients	ND	2584	59.1	2551	60.88	2716	61.78	2748	62.8	2448	60.82	2345	60.75
	LSCS	1788	40.9	1639	39.12	1680	38.22	1628	37.2	1577	39.18	1515	39.25
	Total	4372	100	4190	100	4396	100	4376	100	4025	100	3860	100
Emergency patients	ND	243	48.5	211	41.37	277	46.79	281	50.45	210	37.97	168	35.07
	LSCS	258	51.5	299	58.63	315	53.21	276	49.55	343	62.03	311	64.93
	Total	501	100	510	100	592	100	557	100	553	100	479	100

Table 3: LSCS indications.

	2013		2012		2011		2010		2009		2008	
Previous CS	742	36.3	664	34.3	674	33.8	597	31.4	589	30.7	534	29.2
CPD	247	12.1	239	12.3	249	12.5	228	12	249	13	279	15.3
Failed induction	179	8.75	170	8.77	138	6.92	130	6.83	115	5.99	110	6.02
PIH / eclampsia	89	4.35	107	5.52	129	6.47	133	6.99	150	7.81	128	7.01
APH	27	1.32	26	1.34	32	1.6	33	1.73	29	1.51	31	1.7
Obstructed labor	55	2.69	65	3.35	77	3.86	76	3.99	92	4.79	101	5.53
precious pregnancy	33	1.61	40	2.06	35	1.75	35	1.84	42	2.19	32	1.75
medical disorders	11	0.54	10	0.52	9	0.45	9	0.47	12	0.63	11	0.6
Oligohydromnios	180	8.8	185	9.55	175	8.77	183	9.61	165	8.59	159	8.71
Fetal distress	215	10.5	188	9.7	195	9.77	184	9.66	165	8.59	140	7.67
Malpresentation	135	6.6	126	6.5	131	6.57	135	7.09	134	6.98	113	6.19
Multiple fetuses	20	0.98	10	0.52	17	0.85	20	1.05	21	1.09	19	1.04
Postdatism	18	0.88	21	1.08	16	0.8	16	0.84	17	0.89	17	0.93
PROM	57	2.79	52	2.68	93	4.66	90	4.73	109	5.68	120	6.57
Macrosomia	28	1.37	26	1.34	20	1	26	1.37	21	1.09	23	1.26
Others	10	0.49	9	0.46	5	0.25	9	0.47	10	0.52	9	0.49
Total	2046	100	1938	100	1995	100	1904	100	1920	100	1826	100

Table 4: Maternal morbidity in cesarean delivery.

	2013		2012		2011		2010		2009		2008	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Wound gap	110	5.376	106	5.47	103	5.163	101	5.305	99	5.156	89	4.874
Puerperal infection	89	4.35	85	4.386	95	4.762	90	4.727	82	4.271	85	4.655
Bladder/bowl injury	5	0.244	4	0.206	6	0.301	6	0.315	5	0.26	7	0.3834
Blood transfusion	149	7.283	145	7.482	138	6.917	136	7.143	148	7.708	135	7.3932
Obs. Hysterectomy	21	1.026	19	0.98	15	0.752	18	0.945	16	0.833	14	0.7667
Overall morbidity	374	18.28	359	18.52	357	17.89	351	18.43	350	18.23	330	18.072
Total CS deliveries	2046	100	1938	100	1995	100	1904	100	1920	100	1826	100

Table 5: Neonatal outcome in cesarean vs. normal delivery.

	CS		ND	
	No.	%	No.	%
Neonatal morbidity	762	6.55%	2238	14.52%
Neonatal mortality	115	0.98%	427	2.77%

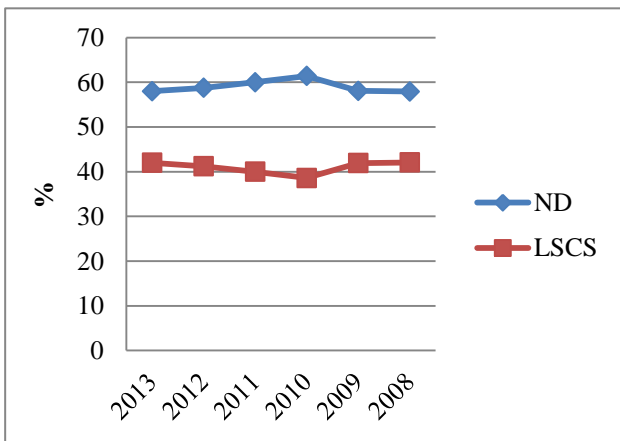


Figure 1: Mode of delivery.

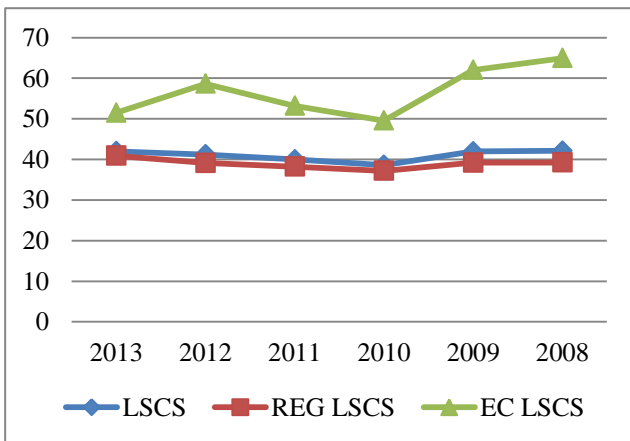


Figure 2: Type of patients.

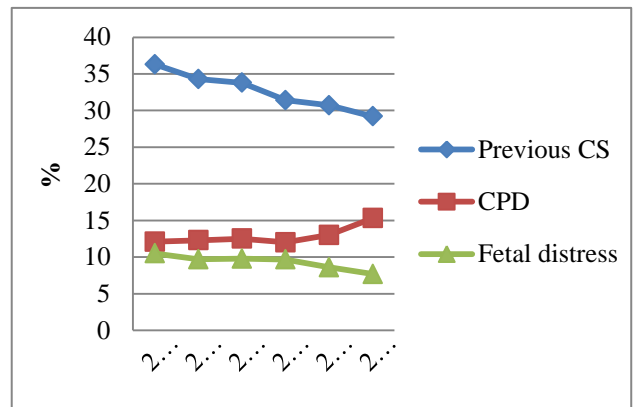


Figure 3: Top three indications of CS.

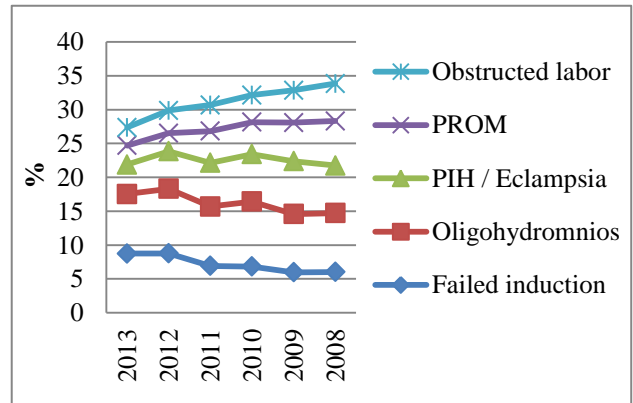


Figure 4: Other indications.

DISCUSSION

The justification for caesarean section arises from clinical judgment that the interests of the mother, fetus or both are better served by resorting to caesarean delivery in order to avoid the continuation of pregnancy or the onset or the continuation of labour. Of course, judgment will be influenced by the population served, facilities available and clinical skills of the medical personnel. Thus, in modern era indications for caesarean section are also changing constantly, many times with the norm of ‘if in doubt do a caesarean.’^{1,10} Many indications are based on continuous intervention and modification of medical

technology for predicting maternal and fetal outcome such as fetal monitoring, increasing labour induction, concern for LBW and VLBW, USG detection of IUGR, multiple gestation due to IVF, etc. Growing trend of privatization of medical practice, availability of health insurance, apprehension of malpractice suits and governmental pressure of safe delivery are some of the many factors responsible for doctor's preference for this surgical procedure. As a result, increased demand (maternal request without medical indication) and increased supply (willingness of doctors to accept this demand in rapidly growing well-equipped medical setups) both have boosted.² The caesarean section rate in this study ranged from 38 to 42%, considerably higher than recommended by the WHO guidelines. The higher rate might be because of lower preference to instrumental vaginal delivery, higher CS rate in breech presentation, very low rate of vaginal birth after caesarean delivery, increasing number of high risk patients in referred and registered patients, and well-equipped neonatal ICU and blood-bank facilities.

Maternal and fetal morbidity and mortality increases upto three times in cesarean section performed in second stage of labour after failure attempt of normal labor in high risk pregnancies. More chances of maternal and fetal injuries during operative vaginal delivery (forceps and vaccume delivery) and breech normal delivery by relatively inexperienced obstetrician and less-equipped medical setups; increased risk of ruptured uterus and need of blood transfusions in excessive long trial of normal delivery in patients with previous cesarean delivery are major concerns of any obstetrician.⁵ All of above mentioned risks along with availability of safe anesthetic techniques in emergency obstetrics and governmental, social and medico-legal expectations of a perfect perinatal outcome have directly or indirectly encouraged obstetricians for elective cesarean delivery in moderate to high risk pregnancies. Improvements in blood transfusion, antibiotics and thromboprophylaxis have increased the perioperative safety. Improved surgical techniques have reduced not only the immediate perioperative complications of caesarean section, but also lessened the risks in subsequent pregnancy. In our study, neonatal morbidity and mortality was significantly less in comparison to normal delivery. Also, major operative complications such as wound infection and fever were comparable to that of patients with normal delivery. Blood transfusion rate was four folds in patients with cesarean section.

Studies in different countries have shown that women from high SLI are 1.5 times more likely to deliver by caesarean section. The women with more than secondary education are 1.25 times likely to have caesarean birth. Women with regular ANC are 1.4 times more prone to undergo this interventional operation.² The NFHS data analysis clearly pointed out that caesarean birth rate is much higher in urban private institutes, followed by urban governmental institutes and rural private institutes

in majority of Indian states including Gujarat. The women are 1.7 times more likely to undergo caesarean birth if delivered in private institutes. In our study, around 40% CS rate in registered patients and 48 to 52% CS rate in patients from moderate to higher socio-economic class is reflective of social trends noted in above studies that chances of cesarean delivery is more likely if woman is well educated, from higher socio-economic class and residing in urban area.

A comparative study of the experience of childbirth between women who preferred and had a caesarean section and women who preferred and had a vaginal birth surprisingly revealed that, despite a fulfilled request, women who had undergone caesarean section were not happy with their decision making process. They were less satisfied with antenatal care and had a more negative birth experience due to subsequent short and long term caesarean complications. In china, population-based perinatal surveillance program was conducted to measure Intelligence Quotient (IQ) of 4144 preschool children and concluded that neither caesarean delivery on maternal request nor assisted vaginal delivery affected children's IQ in comparison to normal delivery.¹¹ Around 66% of Brazilian doctors have accepted that caesarean delivery can be significantly reduced by having second opinion from another doctor. Women's fear of normal delivery can be remarkably eased by educating them during antenatal visits, provision of epidural anesthesia, and peer pressure from the partners.¹²

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REFERENCES

1. Feng XL, Xu L, Guo Y, Ronsmans C. factors influencing rising cesarean section rates in China. *Bull WHO.* 2012;90:30A-9A.
2. Ghosh S. Increasing trend in cesarean 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.
3. Karim F, Ghazi A, Ali T, Aslam R, Afreen U, Farhat R. Trends and determinants of cesarean section. *J Surg Pak (Int).* 2001 Jan-Mar;16(1):22-7.
4. Khawaja M., Jurdi R., Khasholian T. Rising trends in cesarean section rates in Egypt. *Birth.* 2004 Mar;31(1):12-6.
5. Mehta A., Apers L., Verstraelen H., Temmerman M. Trends in cesarean section rates at a maternity hospital in Mumbai, India. *J Health Popul Nutr.* 2001 Dec;19(4):306-13.
6. Menacker F, Hamilton BE. Recent trends in cesarean delivery in the United States. *NCHS Data Brief.* 2010 Mar;(35):1-8.
7. Menacker F. Trends in cesarean rates for first births and repeat cesarean rates for low-risk women: United

- states, 1990-2003. *Natl Vital Stat Rep.* 2005 Sep;54(4):1-8.
8. Mukherjee SN. Rising cesarean section rate. *J Obstet Gynecol India.* 2006 Jul/Aug;56(4):298-300.
9. Sucak A, Celen S, Akbaba E, Soyol S, Moraloglu O, Daniman N. Comparison of Nulliparas undergoing cesarean section in first and second stages of labour :
A prospective study in a tertiary teaching hospital. *Obstet Gynecol Int.* 2011;2011:986506.
10. World Health Organisation. Appropriate technology for birth. *Lancet.* 1985;2:436-7.

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