

COMMENT**Caesarean section: Evaluation, guidelines and recommendations****GITA ARJUN****Director and obstetrician-gynaecologist, EV Kalyani Medical Centre, 4 Second St, Dr R K Salai, Chennai 600 004 INDIA email: gitarjun@gmail.com**

Caesarean section is a life-saving procedure firmly ensconced in obstetric practice. With the advances in anaesthetic services and improved surgical techniques, the morbidity and mortality of this procedure have come down considerably. This has, albeit wrongly, emboldened obstetricians to perform more and more Caesarean sections, generating a universal upswing that has hit both developing and developed countries. Unfortunately, given our economic constraints, India is hardly equipped to handle the repercussions of such an unprecedented increase in surgical interventions.

Over the last 20 years there has been a disturbing increase in the rate of Caesarean sections in India. It used to be a matter of pride to have low Caesarean section rates, especially in teaching hospitals. A collaborative study done by the Indian Council of Medical Research (ICMR) in the 1980s showed a Caesarean section rate of 13.8 per cent in teaching hospitals (1). This has risen significantly. A study to examine the escalating rates of Caesarean sections in teaching hospitals in India compared the rates between 1993-94 and 1998-99, with data from 30 medical colleges/teaching hospitals (2). The overall rate showed an increase from 21.8 per cent in 1993-94 to 25.4 per cent in 1998-99. What was alarming was that 42.4 per cent were primigravidas and 31 per cent had come from rural areas. Because of the rise in primary Caesarean sections, there is a proportionate rise in repeat sections as well. Between 1990 and 1992 the repeat rate was between 30 and 45 per cent in teaching hospitals in Madurai and Chennai (3).

In a study over a two-year period in an urban area of India, the total Caesarean section rates even in the public and charitable sectors were 20 and 38 per cent respectively. In the private sectors, the rate was an unbelievable 47 per cent (4). A similar study from an affluent part of Chennai showed that almost every other woman (45 per cent) had a Caesarean section (5). These rates cannot be justified.

The rate of Caesarean section is relatively higher in Kerala and Goa (6). A 1995 study in Tiruvananthapuram, Kerala, found that the Caesarean section rate in the private sector (30 per cent) was three times that of the public sector (10 per cent) (7). In addition, in Andhra Pradesh, Bihar, Gujarat, Karnataka, Punjab and Uttar Pradesh the chance of having a Caesarean is four or more times higher in private institutions as compared to public ones. This raises the question of whether this life-saving surgical intervention is being motivated by monetary profit in several states (6).

Public perception of Caesarean sections has seen a swing from a "failure of obstetric care" to being "safe for mother and child." There have been occasions where an obstetrician has been manhandled for a poor outcome and blamed needlessly for not having performed a Caesarean section. At the same time media glare has fallen unfavourably on the rise in rates of these procedures. Why have the rates increased and what are the strategies to reduce the rates of Caesarean sections?

Rising rates of caesarean sections: Why?

It is difficult to pinpoint an exact cause for the rising rates of Caesarean sections. It is also not easy to fix an optimal rate. In the United States a 15 per cent Caesarean section rate is seen as the goal to achieve (8). The WHO too recommends 15 per cent as the optimal rate. It is interesting to note that even a decade ago only three countries had rates lower than this (9). India has yet to establish guidelines for acceptable Caesarean section rates. Taking into account the usual obstetric indications, the acceptable rate seems to be 10 to 15 per cent (10).

Caesarean section rates are definitely influenced by several factors: teaching versus non-teaching hospitals, private versus public hospitals, solo versus group practice, socio-economic status of the patient, and round-the-clock availability of ancillary support like anaesthetic, paediatric and blood bank services.

High-risk patients do not show a large variation in Caesarean rates, regardless of where they deliver. The largest variation occurs in the low-risk patient category, specifically the nulliparous patient with term singleton foetuses with vertex presentation without other complications. It has been shown that in this group perinatal morbidity and mortality rates are not improved by the performance of a Caesarean section (11). In another study, perinatal mortality increased despite doubling of the Caesarean section rate. These findings suggest that the increase in Caesarean sections did not improve perinatal deaths (12). A study from a hospital in Mumbai showed that though the Caesarean section rate increased from 1.9 to 16 per cent in 40 years, it did not accompany a corresponding improvement in overall perinatal outcome beyond a Caesarean section rate of 10 per cent (13).

In fact, an unindicated Caesarean may do more harm than good. In a low-risk, uncomplicated pregnancy, it has an eightfold higher mortality than vaginal delivery (14), 8 to 12 times higher morbidity (15), and a higher incidence of complications in

subsequent pregnancies.

In India one of the problems that may escalate Caesarean section rates is the high prevalence of solo practices as opposed to group practice. For a busy obstetrician the practical realities, such as a waiting room full of patients or a desire to deliver the patient before going away or during daytime hours, could be a major incentive to proceed with a Caesarean section.

Patient demand has complicated this already complex issue. In the United Kingdom it was the third commonest indication for elective Caesarean section in 1992 (16). Fear of the pain of labour and avoiding injury to the perineum, which may lead to sexual dysfunction, are some of the reasons quoted. In India there is a great emphasis placed on the astrological calendar, and the demand for a baby to be born in an auspicious time has placed great pressure on obstetricians. When they acquiesce to such demands, the rate will naturally go up (17).

Evidence-based practice guidelines for India

Since Caesarean sections are one of the most frequently performed operations in women, any attempt to reduce morbidity, even with relatively modest differences for a particular outcome, is likely to have significant benefits in terms of costs and health benefits.

In an under-resourced country like India, it is important to look at interventions that will make a difference. The following are evidence-based strategies and interventions that have been shown to reduce morbidity, the cost of the operation and benefit the patient.

Antibiotic usage in Caesarean sections

The single most important risk factor for postpartum febrile morbidity is a Caesarean section. In developing countries other factors, including malnutrition and poor social conditions, are likely to exacerbate the already higher risk of infectious morbidity and mortality associated with a Caesarean section. The high prevalence of poor social and economic conditions, anaemia, blood loss, repeated vaginal examinations, pre-labour rupture of membranes, and other pathological conditions could account for a stronger protective effect of antibiotic prophylaxis (18).

A systematic review of published data has shown that use of prophylactic antibiotics in women undergoing Caesarean section substantially reduced the incidence of episodes of fever, endometritis, wound infection, urinary tract infection and serious infection after Caesarean section (19).

In India, where in some areas one out of two women are delivering by an abdominal route, deciding which antibiotic is most suitable as a prophylactic is very important. The systematic review of the Cochrane Database recommends the use of ampicillin or first-generation cephalosporin (cefazolin). A single dose given just at the start of surgery with a possible one or two doses after the procedure is the recommendation (19).

The alarming abuse of antibiotics, with women getting

expensive antibiotics in multiple doses over several days, should be abandoned.

Closure of peritoneum

Unfortunately it continues to be a practice to close the visceral and parietal peritoneum after a Caesarean section. A systematic review has shown that there is improved short-term post-operative outcome if the peritoneum is not closed. Long-term studies following Caesarean sections are limited, but data from other surgical procedures are reassuring. There is at present no evidence to justify the time taken and the cost of peritoneal closure (20).

One- or two-layer closure of the uterine incision

First introduced by Hauth and colleagues in 1992 (21), a continuous locking single-layer closure of the uterine incision seemed to reduce the operative time. Subsequently, Bujold and associates have published data showing a fourfold increase in uterine rupture in a subsequent labour following single-layer closure (22). In an under-resourced setting like India where a uterine rupture can be a catastrophic if not fatal complication, a traditional two-layer closure seems to be safer.

Interval between Caesarean sections

The rupture rate for women who delivered their second babies within 24 months of the Caesarean section is three times compared to births more than 24 months beyond the Caesarean (23). It is, therefore, very important to implement reliable birth control methods for two to three years after a Caesarean section.

Early feeding after an uncomplicated Caesarean section

Early initiation of feeding was associated with reduced time to return of bowel sounds, reduced post-operative hospital stay, and with suggestion of reduced abdominal distention. There is no evidence to justify a policy of restricting oral fluids or food after uncomplicated Caesarean section (24).

Curbing rising Caesarean section rates: Practical strategies

Audit and feedback

Obstetricians in institutional or private practice must accept an audit of their practice norms. This must be perceived as necessary and must be a part of clinical processes and protocols. Where the baseline of adherence to recommended practices is low, which is often the case in under-resourced settings, there is a greater likelihood of success with audit and feedback (25)

Educating physicians and patients alike on acceptable Caesarean rates will have a positive effect. In institutions, both public and private, periodic peer review will help bring down the Caesarean section rate (3).

There are several indices that should be looked at: total Caesarean section, primary Caesarean section rate, and repeat Caesarean section. To eliminate confounding factors, it seems better to focus on nulliparous women at 37 weeks of gestation or greater with singleton fetuses with vertex presentation. The

rate in this group should be between 15 and 17 per cent (26).

Solo versus group practice

It has been shown that if a practitioner is present round the clock in an institution, the Caesarean section rate will come down (26). Obstetricians in private practice should make an effort to structure formal or informal practice groups that will provide 24-hour in-house obstetric coverage.

Fear of litigation

Brain damage in a newborn has been traditionally blamed on the obstetrician. There has been evidence for decades that intrapartum factors or birth injury does not result in brain damage. Education of obstetricians, paediatricians and lawyers regarding this might bring down Caesarean section rates.

Vaginal birth after caesarean section (VBAC)

There is consensus that a trial of labour is appropriate for most women who have a single previous low-transverse Caesarean delivery, though this (VBAC) may have a small degree of risk for both mother and foetus (27). This used to be accepted practice in India, but repeat Caesarean sections seem to be on the rise. In properly selected cases allocated to undergo VBAC, 60 to 80 per cent will have a vaginal delivery. It is important to have an in-house obstetrician and 24-hour anaesthetic and paediatric and blood bank services to safely handle VBAC.

External cephalic version

Hannah et al in a multicentric study showed that compared with planned vaginal birth, planned Caesarean section reduced perinatal or neonatal death or serious neonatal morbidity for the singleton breech baby at term, at the expense of somewhat increased maternal morbidity (28).

It has also been shown that external cephalic version will decrease the rate of primary Caesarean section for breech presentation. In both developing and developed countries a planned Caesarean section should only be considered only after external cephalic version has failed (29).

Conclusion and recommendations

With a multitude of health care delivery systems in India, implementing universal protocols becomes an onerous task. To actively battle the unhealthy trend of increasing Caesarean section rates, the impetus for change has to come from both the individual practitioners and institutional caregivers. Women have to be well educated on their basic right to a vaginal delivery. They must also be actively informed that a Caesarean section does not automatically protect maternal and foetal health.

References

1. Indian Council of Medical Research. *Collaborative study on high risk pregnancies and maternal mortality* (ICMR task force study). New Delhi: ICMR; 1990.
2. Kambo I, Bedi N, Dhillon BS, Saxena NC. A critical appraisal of cesarean section rates at teaching hospitals in India. *Int J Gynaecol Obstet* 2002 Nov;79(2):151-8.
3. Bhasker Rao, K. Global aspects of a rising caesarean section rate. In: Popkins DR, Peddle, LJ, editors. *Women's health today: perspectives on current research and clinical practice. The proceedings of the XIV world congress of obstetrics and gynecology*, Montreal; 1994. p 59-64.
4. Sreevidya S, Sathiyasekaran BWC. High caesarean rates in Madras (India): a population-based cross-sectional study. *BJOG* 2003 Feb;110(22):106-11.
5. Pai M, Sundaram P, Radhakrishnan KK, Thomas K, Muliylil JP. A high rate of Caesarean sections in an affluent section of Chennai. Is it a cause of concern? *Natl Med J India* 1999 Jul-Aug;12(4):56-8.
6. Mishra US, Mala R. Delivery-related complications and determinants of caesarean section rates in India. *Health Policy Plan* 2002;17(1):90-9.
7. Homan RK, Thankappan KR. *Performance of private and public sector hospitals in Thiruvanthapuram district, Kerala* (unpublished report). UNDP-GOI-IDRC research project. Thiruvanthapuram: Centre for Development Studies, India; 1995. 26-7.
8. US Department of Health and Human Services, Public Health Service. *Healthy people 2000: national health promotion and disease prevention objectives*. Washington, DC: DHHS; 1991.
9. Walker R, Turnbull D, Wilkinson C. Strategies to Address Global Caesarean Section Rates: A Review of the Evidence. *BIRTH* 2002 Mar;29(1):45-56.
10. WHO Consensus Conference on Appropriate Technology for Birth. *Lancet* 1985;2:436-37.
11. O'Driscoll K, Foley, M. Caesarean section and perinatal outcome. *Am J Obstet Gynecol* 1987;158:449-52.
12. Mukherjee J, Bhattacharya PK, Lahiri TK, Samaddar JC, Mehta R. Perinatal mortality in caesarean section: a disturbing picture of unfulfilled expectations. *J Indian Med Assoc* 1993 Aug;91(8):202-3.
13. Mehta A, Apers L, Verstraelen H, and Temmerman M. Trends in Caesarean section rates at a maternity hospital in Mumbai, India. *J Health Popul Nutr* 2001 Dec;19(4):306-12.
14. Petitti DB. Maternal mortality and morbidity in caesarean section. *Clin Obstet Gynecol* 1985 Dec;28(4):763-9.
15. Boehm FH, Graves CR. Caesarean birth. In Rivlin ME, Martin RW, eds. *Manual of Clinical Problems in Obstetrics and Gynecology*. Boston: Little Brown; 1994:158-62.
16. Atiba EO, Adeghe AJ, Murphy PJ, Felmingham JE, Scott GI. Patients' expectations and caesarean section rates. *Lancet* 1993 Jan 23;341(8839):246.
17. Kabra SG, Narayanan R, Chaturvedi M, Anand P, Mathur G. What is happening to caesarean section rates? *Lancet* 1994 Jan 15;343(8890):179-80.
18. José GC. Antibiotic prophylaxis for caesarean section: RHL commentary (last revised: 18 January 2005). The WHO Reproductive Health Library, No 10, Update Software Ltd, Oxford; 2007.
19. Smaill F, Hofmeyr GJ. Antibiotic prophylaxis for Caesarean section. The Cochrane Database of Systematic Reviews Issue 3; 2005. The Cochrane Collaboration, published by John Wiley & Sons, Ltd
20. Bamigboye AA, Hofmeyr GJ. Closure versus non-closure of the peritoneum at caesarean section. The Cochrane Database of Systematic Reviews Issue 3; 2005. The Cochrane Collaboration, published by John Wiley & Sons, Ltd.
21. Hauth JC, Owen J, Davis Ro et al. Transverse uterine incision closure: one versus two layers. *Am J Obstet Gynec* 1992 Oct;167:1108-11.
22. Bujold E, Bujold C, Hamilton EF, et al. The impact of a single-layer or double-layer closure on uterine rupture. *Am J Obstet Gynecol* 2002 Jun;186(6):1326-30.
23. Shipp TD, Zeloh CM, Repke JT, Cohen A, Lieberman E. Interdelivery interval and risk of symptomatic uterine rupture. *Obstet Gynecol* 2001 Feb;97(2):175-7.
24. Mangesi L, Hofmeyr GJ. Early compared with delayed oral fluids and food after caesarean section (Cochrane Review). The Cochrane Library, Issue 4; 2006.
25. Pattinson R. Audit and feedback: effects on professional practice and health-care outcomes: RHL commentary (last revised: 15 December 2006). The WHO Reproductive Health Library.
26. American College of Obstetricians and Gynecologists. Task Force on Cesarean Delivery. *Evaluation of Cesarean Delivery*; 2000.
27. Rosen MG, Dickinson JC, Westhoff CL. Vaginal birth after cesarean: a meta-analysis of morbidity and mortality. *Obstet Gynecol* 1991 Mar;77(3):465-70
28. Hofmeyr GJ, Hannah ME. Planned Caesarean section for term breech delivery (Cochrane Review). Cochrane Database of Systematic Reviews,

FINANCIAL REPORT 2006-2007

In the year 2006-7 we see for the first time the actual expenses of running the *Indian Journal of Medical Ethics* reflected. We incurred expenses for services of regular staff, payment of honoraria, and infrastructural support to run the journal. It has also become possible to give modest honoraria to the executive editor and for copy-editing.

The income in the year 2006-7 was from the following sources: Subscriptions: Rs 98,863; Sale of back issues: Rs 7,650; Registration and accommodation: Rs 154,200; Membership fees: Rs 400; and Interest: Rs 96,204.

The Forum for Medical Ethics Society spent Rs 105,760 on printing, Rs 44,451 on postage, Rs 145,385 on honoraria and wages, and another Rs 12,022 on stationery. Approximately Rs 20,000 went into other expenses. The other major expense was registration and accommodation for the Second National

Bioethics Conference.

The subscription base continues to be a cause for concern, and efforts are on to increase the reach of the journal. We continue to send gift subscriptions to medical colleges recognised by the Medical Council of India and to selected institutions in South Asia.

We hope well-wishers will recommend the journal to others as well as send gift subscriptions. We also hope that institutions receiving gift subscriptions will consider renewing their subscriptions.

Donations to the Forum for Medical Ethics Society are eligible for 50 per cent tax exemption under section 80G of the Income Tax Act.

BALANCE SHEET	
Properties and assets	Rs
Fixed assets	2,925.00
In savings bank account	511,414.60
Fixed deposits	1,038,021.00
Cash in hand with trustee	10,384.90
Advance tax deducted at source	4,325.00
Total	1,567,070.50
Funds and liabilities	
Trust funds or corpus	11,157.00
Contingencies reserve fund	45,000.00
Life subscription fees (refundable)	430,570.00
Liabilities towards expenses	398.00
Balance as per last balance sheet	1,170,312.30
Excess of expenditure over income	(9,036,680.30)
Income and expenditure account	1,079,945.50
Total	1,567,070.50

Expenses incurred on objects of the Trust (educational)		
Sr. No.	Particulars	Rs
1	Journal expenses	
(a)	Cost of printing journal	105,716.00
(b)	Printing and stationery	12,022.50
(c)	Handling charges	3,900.00
(d)	Postage and courier of journal	44,451.50
		166,090.00
2	Others	
(a)	Registration and accommodation	105,236.00
(b)	Honoraria	140,325.00
(c)	Telephone and fax charges	1,078.00
(d)	Hospitality and meeting charges	1,536.00
(e)	Salary and wages	5,460.00
(f)	Computer expenses	9,921.00
(g)	Travel and conveyance expenses	9,893.00
(h)	Miscellaneous expenses	200.00
(i)	Photocopying charges	1,816.50
(j)	Bank charges	1,635.30
		277,100.80