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Review Article

A review of caesarean section rates in India: causes for increased prevalence and suggestions for a rational approach

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ABSTRACT

An increasing Caesarian Section (CS) rate places a clinical and economic burden on health care services of the country. When balancing an optimal CS rate, maternal and pediatric outcomes of pregnancy such as maternal morbidity and birth complications should be considered. A CS can be a life-saving intervention when medically indicated, but this procedure can also lead to short-term and long-term health effects for women and children. For society, a caesarean section is more costly than a vaginal delivery. The increased rate of CS can be attributed to medical and non-medical factors like increases in maternal age and body mass index as well as changes in obstetric practice and technology. The WHO has recommended the Robson 10 Group classification as a global standard tool for monitoring CS. This system classifies CS into 10 mutually exclusive groups based on the parity, gestational age at admission, onset of labour, fetal presentation and number of fetuses. The WHO also emphasises that the focus should be to provide caesarean sections to all women in need rather than striving to achieve any specific rate at the population level. It also encourages a shift in the focus from optimal caesarean section rates to more practical proposals which are amenable to action. In the private healthcare setup, commitment to improvement and strategies such as full time availability of obstetricians, better midwife support and regular audits will help move towards an acceptable CS rate. In conclusion, the onus must not be on just reducing CS rates but on scientific methods of deciding when a woman needs the surgery and to ensure safe healthcare environments for the same. Training in obstetrics for specialists must not neglect appropriate procedures like instrumentation.

Keywords: Caesarian section, CS rates, Medical factors, Non-medical factors, Optimal rates

INTRODUCTION

Roman law under Julius Caesar decreed that a woman who was dead or dying during childbirth must be cut open to save the baby. The Latin term "caedere" means "to cut" and the term "caesones" was applied to infants born by postmortem operations. Perhaps this was the reason for the word caesarean.¹ Over the years, the objectives of caesarean section have evolved from rescuing the fetus or for cultural or religious reasons towards concerns for the safety of mother and child as well as considering the mother's preferences.² The procedure of Cesarean Section

(CS) in the current medical scenario has become a largely safe practice thanks to better anesthesia, aseptic precautions, improved specific surgical techniques, antibiotics and availability of banked blood.

INCREASED C SECTION RATES- NATIONAL AND INTERNATIONAL

In India, according to data from the District Level Household Survey (DLHS 4) in 2011, the prevalence of CS births in public sector health facilities was 13.7% as compared to 37.9% in private sector health facilities. CS

births were observed more in women from urban residence, women whose first delivery was after 35 years of age, those with hypertension in pregnancy and breech presentation of fetus.³

Increasing CS rates (9% in 2005-06 to 17% in 2015-16) places a clinical and economic burden on health care services of the country. According to the National Family Health Survey (NFHS-4) 2015-16, 21% of the low-risk women and 24% of all women who had delivered in an institution had undergone CS (40% among low-risk pregnant women in private institutions).⁴ CS rates are of concern to not only clinicians and women but to the society as a whole. It is not whether the rates are high or low, but rather whether they are appropriate or not, based on relevant information and also in line with societal changes.⁵

IS THERE A RECOMMENDED RATE FOR CESAREAN SECTION?

At the population level, CS rate is an indicator of the access and use of an effective obstetric intervention which saves lives. It is not easy to determine the minimum and maximum rates of CS in the population and to identify the number of CS which is medically unnecessary. The World Health Organization (WHO) in a meeting of a panel of reproductive health experts in 1985 in Brazil stated that there was no justification for any region to have a caesarian rate higher than 10-15%. However this conclusion was made from available limited data pertaining to a few northern European countries which already had good maternal and perinatal outcomes with that rate of caesarean sections.

In the public sector, a lower CS rate may simply reflect the scarcity of infrastructure and human resource. When balancing an optimal CS rate, maternal and pediatric outcomes of pregnancy such as morbidity, birth complications, breast feeding etc should be considered.⁶

Belizán et al in an approach to identify a rational proportion of caesarean sections in resource-poor settings suggested that caesarean section prevalence between 9–19% was associated with lower maternal and neonatal mortality.⁷ However a meta analysis by Betran et al did not reveal any significant association between optimal (threshold) CS rates and mortality at the population level.⁸

EFFECTS OF CAESARIAN SECTION ON MOTHERS AND CHILDREN

A caesarean section (CS) can be a life-saving intervention when medically indicated, but this procedure can also lead to short-term and long-term health effects for women and children. The short term effects in the mother are intrapartum blood loss with a need for blood transfusion and risk of infections in the post operative period. Long term effects in the mother are an increased risk of uterine rupture, abnormal placentation and ectopic pregnancies.

It has been suggested that babies born by CS have different influences acting on them which may affect their physiology in the neonatal period. Altered immune development, an increased likelihood of allergies and reduced intestinal gut microbial diversity are some suggested effects. An association between CS use and greater incidence of late childhood obesity and asthma has been reported.⁹ Caesarean delivery is associated with decreased fertility in the future and subsequent pregnancy related risks like placenta previa, uterine rupture, and stillbirth.^{10,11} CS is associated with postpartum respiratory morbidity, less breast-feeding and increased atopic disease in the child. For society, a caesarean section is more costly than a vaginal delivery.¹²

FACTORS INVOLVED IN INCREASED CAESARIAN RATES

Since 1985, the international healthcare community has considered the ideal rate for caesarean sections to be between 10% and 15%. Since then, caesarean sections have become increasingly common in both developed and developing countries.¹³ The increased rate of caesarean sections can be explained by both medical and non-medical factors. Among the medical factors are increases in maternal age and body mass index, as well as changes in obstetric practice and technology.

Some non-medical factors are caesarean section requested by the mother, fear of litigation among caregivers and inappropriate organization of maternity care. Reasons for increased trend in C sections include fear of pain, fear of medical litigation, financial incentives, and socio-cultural factors etc.¹⁴

Changes in the characteristics of the population include increase in the prevalence of maternal obesity, increase in the proportion of nulliparous woman, higher maternal age at birth and increase in multiple births.¹⁵ Worldwide, obstetricians' fear of litigation, convenience, and declining skills for instrumental deliveries has added to this phenomenon. Rising CS rates have also been ascribed to higher-income group women wanting CS, financial incentive in private healthcare and poor support from midwives. Attempts to lower CS rate include issuing guidelines, providing uniform remuneration for both CS and vaginal deliveries, active management of labour, audit, mandatory second opinions, and expanding role of midwives which have all shown mixed results.¹⁶

GLOBAL MONITORING OF CS- WHO RECOMMENDATIONS

WHO has recommended the Robson 10 group classification as a global standard tool for monitoring CS.¹⁷ This system classifies CS into 10 mutually exclusive and exhaustive groups based on the parity, gestational age at admission, onset of labour, fetal presentation and number of fetuses.¹⁸

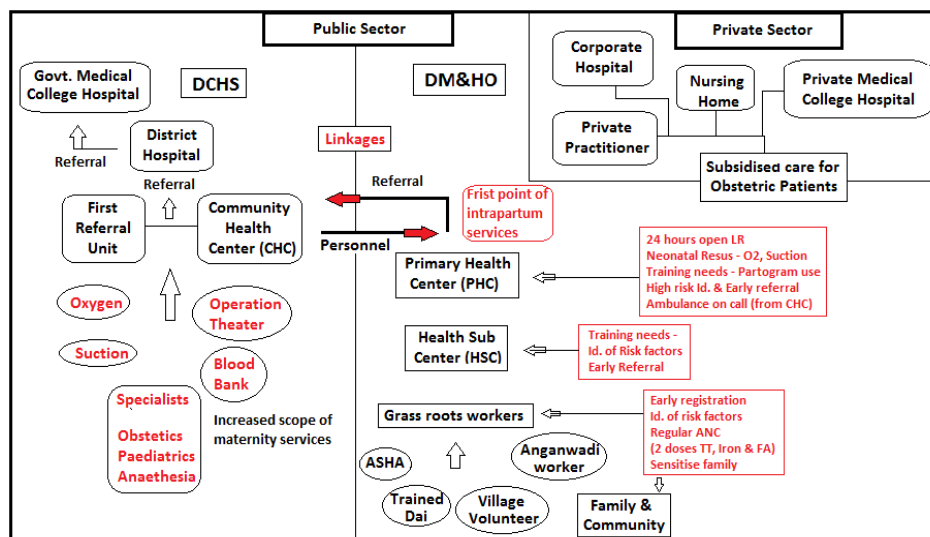


Figure 1: Improved maternity care with better intrapartum services.

The greatest opportunities for having a vaginal delivery are those women who are nulliparous, ≥ 37 weeks and in spontaneous labour. Other than a decision of elective cesarean section, the greatest risk of CS is in those who are nulliparous, > 37 weeks and not in labor. When the criteria for induction of labour are not well defined and there is no clarity within the obstetric team, there is risk of failure of induction and consequent CS.¹⁹

SUGGESTIONS FOR A RATIONAL APPROACH TO CS

The WHO emphasises that the focus should be to provide caesarean sections to all women in need rather than striving to achieve any specific rate at the population level. It also encourages a shift in the focus from optimal caesarean section rates to more practical proposals which are amenable to action.²⁰

In the private healthcare setup, commitment to improvement and strategies such as full time availability of obstetricians, better midwife support and regular audits will help move towards an acceptable CS rate.²¹ Attempts to establish an appropriate minimum number of procedures per population should go hand in hand with focusing on the life-threatening causes for the mother and child.⁷

In an increasingly busy world, with nuclear type of family the norm, a young pregnant woman has no one to counsel or educate her about labour and how to handle it. It is now left to the health system and the attending healthcare workers, to fill that gap and prepare the mother emotionally and with sufficient knowledge about the labour process. While all pregnancies are at minimal risk, some are at high risk and there should be clarity in ascribing risk status. Additional social support for high risk pregnant women, hypnosis and acupressure for pain management during labour, alternative institutional birth

setting for low risk women, and intensive group therapy are suggested interventions²².

The partogram is a good example of appropriate technology which contributes to better quality of delivery care by identifying dystocia and making suitable interventions. It reduces unnecessary strain on mothers by reducing total duration of labour, without any increased foetal morbidity and mortality.²³

DECREASED DURATION OF LABOUR

Prolonged labor, in addition to increased risk of morbidity in both mother and baby, also causes her much discomfort and also considerable stress in the waiting relatives which may lead to surgical intervention. There is an increased risk of infection, dehydration and its complications, and loss of morale. Chances of asphyxia and infection are also higher in the baby with possible neurological damage and also death. The obstetrician's concern should therefore centre on the duration of labor which has a significant influence on both maternal and fetal morbidity.²³

Interventions to accelerate labour to conform to a cervical dilatation threshold of 1 cm/hour may be inappropriate as it has been observed that averaged labour curves may not truly reflect the variability associated with labour progression. Care should be taken before considering slow progress of labour or dystocia and taking premature decisions of management.²⁴

Better standardised equipment for monitoring and interpretation of fetal heart rate is a necessity. Non medical interventions during labor such as continuous labor support, ensuring adequate hydration, conserving energy and encouraging mobility have been shown to reduce cesarean birth rates. CS rates in the first pregnancy can also be reduced with maneuvers such as external cephalic version for breech presentation and a trial of labor for

women with twins where the first one is in cephalic presentation.²⁵

The Better Outcomes in Labour Difficulty (BOLD) project of the WHO was set to improve the quality of intrapartum care in low- and middle-income countries. The main goal of the BOLD project is to address the critical barriers to good quality intrapartum care and enhancing the connection between health systems and communities. SELMA (Simplified, Effective, Labour Monitoring-to-Action) is a project that seeks to develop innovative service prototypes/tools to promote respectful, dignified and emotionally supportive care for pregnant women at the time of birth.²⁶

RURAL HEALTHCARE NETWORK AND TRAINING NEEDS

In India, an extensive network of Health Sub Centers - HSC (Population 5000) and Primary health Centers - PHC (population 30,000) has been established since the 1950s in the rural areas. A third tier namely the Community Health Center (CHC) was developed later (population 1,20,000). The CHC was envisaged as the First Referral Unit (FRU) where basic specialists and lifesaving equipment would be available. The HSC is manned by 2 Multi Purpose Health Workers (MPHW) whose main work comprises minor ailments care and serving the Antenatal women and infants along with involvement in all national health programmes. Deliveries except those which are precipitous in nature would not take place in the HSC and all intranatal patients would be referred to the PHC. The PHC would have the requisite infra structure to conduct a normal delivery. The emphasis should be on identifying those at risk and referring them early to the CHC. Use of partogram, high risk identification and appropriate referral are the training needs at this level. Once the patient arrives at the CHC, she would be in good hands provided that there are the necessary specialists (Obstetrician, Paediatrician and Anesthetist) available and needed facilities like blood bank, up to date Operation Theater with Oxygen, suction etc. Obstetric departments training post graduates must bring back training in the application of forceps, external podalic version and use of vacuum extractor with an emphasis on when to use them safely. (Figure 1)

CONCLUSION

While there is alarm about the high CS rates in countries all over the world including India, one must not overlook the fact that the technology for Caesarian sections in today's world are safe and the risk to both mother and baby are minimal in well established medical settings. Having stated that, there is no need to expose mothers at low risk to even minimal risk of surgery and the concomitant risks. To improve intrapartum care in both urban and rural areas of India, the following suggestions are made. All high risk deliveries must be conducted at least in CHC/FRU level where there is an obstetrician, an anesthetist and a

paediatrician. Good OT facilities, blood bank etc. are essential for safe deliveries. Emergency obstetric care should be subsidised by the Govt. at all levels. There is a need for identification of obstetric risk factors and emergencies by family members and grass root level health workers. The onus must not be on just reducing CS rates but on scientific methods of deciding when a woman needs the surgery and to ensure safe healthcare environments for the same. Training in obstetrics for specialists must not neglect appropriate procedures like instrumentation.

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REFERENCES

1. Cesarean Section - A Brief History Part 1. Available at: <https://www.nlm.nih.gov/exhibition/cesarean/part1.html>. Accessed on 20 December 2021.
2. Todman D, A history of caesarean section: from ancient world to the modern era. *Aust N Z J Obstet Gynaecol.* 2007;47(5):357-61.
3. Singh P, Hashmi G, Swain PK. High prevalence of cesarean section births in private sector health facilities- analysis of district level household survey-4 (DLHS-4) of India. *BMC Public Health.* 2018;18(1):613.
4. Kumar P, Dhillon P. Household- and community-level determinants of low-risk Caesarean deliveries among women in India. *J Biosoc Sci.* 2021;53(1):55-70.
5. Robson MS. Can we reduce the caesarean section rate? *Best Pract Res Clin Obstet Gynaecol.* 2001;15(1):179-94.
6. The Federation of Obstetric & Gynecological Societies of India. Available at: <https://www.fogsi.org/fogsi-cesarean-rates-jdt/>. Accessed on 20 December 2021.
7. Belizán JM, Minckas N, McClure EM, Saleem S, Moore JL, Goudar SS et al. An approach to identify a minimum and rational proportion of caesarean sections in resource-poor settings: a global network study, *Lancet Glob Health.* 2018;6:e894-901.
8. Betran AP, Torloni MR, Zhang J, Ye J, Mikołajczyk R, Deneux-Tharoux C et al. What is the optimal rate of caesarean section at population level? A systematic review of ecologic studies. *Reprod Health.* 2015;12:57.
9. Sandall J, Tribe RM, Avery L, Mola G, Visser G, Homer C, et al. Short-term and long-term effects of caesarean section on the health of women and children. *The Lancet.* 2018;392:1349-57.
10. Keag OE, Norman JE, Stock SJ. Long-term risks and benefits associated with caesarean delivery for mother, baby, and subsequent pregnancies: Systematic review and meta-analysis. *PLoS Med.* 2018;15(1):e1002494.

11. Wolf JH. Risk and Reputation: Obstetricians, Cesareans, and Consent. *J Hist Med Allied Sci.* 2018;73(1):7-28.
12. Tollanes MC, Increased rate of Caesarean sections--causes and consequences, *Tidsskr Nor Laegeforen.* 2009;129(13):1329-31.
13. WHO Statement on Caesarean Section Rates. Available at: WHO_RHR_15.02_eng .pdf; jsessionid =7653D2B16C0FF71F488A3C79FFC5172C?sequence=1. Accessed on 20 December 2021.
14. WHO 2015, WHO Statement on Caesarean Section Rates World Health Organization Department of Reproductive Health and Research 1211 Geneva 27. Available at: http://apps.who.int/iris/bitstream/handle/10665/161442/WHO_RHR_15.02_eng.pdf?sequence=1. Accessed on 20 December 2021.
15. WHO recommendations non-clinical interventions to reduce unnecessary caesarean sections. Available at: <https://www.who.int/reproductivehealth/infographic-unnecessary-caesarean-section.pdf>. Accessed on 20 December 2021.
16. Pai M, Unnecessary Medical Interventions: Caesarean Sections as a Case Study. *Economic and Political Weekly.* 2000; 35(31):2755-61.
17. WHO recommendations non-clinical interventions to reduce unnecessary caesarean sections. Available at: <https://www.who.int/reproductivehealth/infographic-unnecessary-caesarean-section.pdf>. Accessed on 20 December 2021.
18. Robson MS. Can we reduce the caesarean section rate? *Best Pract Res Clin Obstet Gynaecol.* 2001;15(1):179-94.
19. Silva CHM, Laranjeira CLS, Use of the Robson Classification System for the Improvement and Adequacy of the Ways of Delivery in Maternities and Hospitals. An Opportunity to Reduce Unnecessary Cesarean Rates. *Rev Bras Ginecol Obstet.* 2018;40(07):377-8.
20. Betrán AP, Zhang J, Torloni MR, Gülmezoglu AM. Determination of a single, universal threshold for caesarean section rate is not the way forward, *Evid Based Med.* 2016;21(6):237.
21. Bhartia A, Dhar RSG, Bhartia S. Reducing caesarean section rate in an urban hospital serving women attending privately in India – a quality improvement initiative. *BMC Pregnancy Childbirth.* 2020:556.
22. Smith V, Gallagher L, Carroll M, Hannon K, Begley C. Antenatal and intrapartum interventions for reducing caesarean section, promoting vaginal birth, and reducing fear of childbirth: An overview of systematic reviews. *PLoS ONE.* 2019;14(10):e0224313.
23. Manjulatha VR, Anitha GS, Shivalingaiah N. Partogram: clinical study to assess the role of Partogram in primigravidae in labor, *Int J Reprod Contracept Obstet Gynecol.* 2016;5(4):1014-25.
24. Oladapo OT, Souza JP, Fawole B, Mugerwa K, Perdoná G, Alves D et al. Progression of the first stage of spontaneous labour: A prospective cohort study in two sub-Saharan African countries, *PLoS Med.* 2018;15(1):e1002492.
25. Safe prevention of the primary cesarean delivery. *Obstetric Care Consensus No. 1. American College of Obstetricians and Gynecologists.* *Obstet Gynecol.* 2014;123:693-711.
26. Oladapo OT, Souza JP, Bohren MA. WHO Better Outcomes in Labour Difficulty (BOLD) project: innovating to improve quality of care around the time of childbirth. *Reprod Health.* 2015;12:48.

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