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Caesarean section – desired rate versus actual need

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ABSTRACT

According to the World Health Organization, governments have expressed interest in the rise in the numbers of caesarean section births and the potential negative consequences for maternal and infant health. If conducted when medically justified, a caesarean section can effectively prevent maternal and perinatal mortality and morbidity. However, there is no evidence showing the benefits of caesarean delivery for women or infants who do not require the procedure. As with any surgical intervention, caesarean sections are associated with short and long-term risk, which can extend many years beyond the current delivery and affect the health of the woman, her child, and future pregnancies. These risks are higher in women with limited access to comprehensive obstetric care. Unequivocally, the potential risks are higher in women with limited access to comprehensive obstetric care, hence the global health concern.

KEY WORDS: *Caesarean section; Infant morbidity and mortality; Maternal morbidity and mortality; Global trends*

INTRODUCTION

The incidence of caesarean section is rising continuously at the global level particularly in high- and middle-income countries.^{1,2} Ideally a caesarean section is indicated when a vaginal delivery could put the baby's or mother's life or health at risk. Caesarean section has been really a lifesaving procedure for very low birth weight babies.³ However some are requested by the mother without any medical indication or some by doctors for their vested interests.⁴ This lifesaving procedure can be a cause of short and long term health problems for women and their babies due to various reasons like: lack of facilities to conduct safe surgeries, inadequate expertise, and surgical complications. For this reason governments and clinicians are showing concern about the rise in the number of caesarean sections and are trying to identify an ideal rate for the same. International health systems have, for more than 30 years, identified 10-15% as an ideal rate for caesarean section to reduce maternal, infant and neonatal mortality.⁵ However, increasing the rate above this value has little effect in reducing the burden of maternal and infant mortality and morbidity.⁶ There is a marked inequity in the use of caesarean section throughout the world: it is often underused in low income countries and overused in middle and high income countries.⁷⁻¹⁰

This commentary analyses the need to fulfill the target rates versus actual need required to reduce infant and maternal mortality and set the standard of caesarean section.

CAESAREAN SECTIONS AND INFANT MORBIDITY AND MORTALITY

Despite growing interest in the rates of elective caesarean delivery and its relative benefits, caesarean section harms the neonate. The data suggest the association between caesarean section and increased neonatal respiratory morbidity and lacerations, possibly decreased central and peripheral nervous system injury and potentially increased risks of neonatal mortality.¹¹ Hansen *et al*¹² showed that infants delivered by elective caesarean at 37 weeks had a 10% incidence of respiratory morbidity such as transient tachypnea of the newborn, respiratory distress syndrome or persistent pulmonary hypertension, compared to 2.8% among infants delivered vaginally. The proposed mechanism associated with increased respiratory morbidity includes iatrogenic prematurity with surfactant deficiency¹³, and an attenuation of the fetal catecholamine surge during labour¹⁴. Infants delivered by caesarean section would be at risk for laceration from sharp instruments, which is 5.3% during emergent caesarean section, 1.8% in unscheduled labored caesarean deliveries and 1% in elective caesareans without labour.¹⁵ Data addressing immediate and long-term neurological outcomes are sparse and conflicting. Badawi *et al*¹⁶ found a lower risk of encephalopathy in infants delivered by elective caesarean section than in those undergoing spontaneous vaginal delivery; on the other hand, Towner *et al*.¹⁷ found higher rates of convulsions and central nervous system depression among infants delivered by caesarean section without labour than in infants delivered spontaneously. Brachial plexus injuries were

significantly less common in caesarean deliveries as compared to operative vaginal deliveries.¹⁷ For more than 15 years, United States vital statistics data have indicated a 1.5-fold increased risk of neonatal mortality after caesarean delivery (both planned and unplanned) compared to vaginal delivery.¹⁸ This clearly suggests that doctors should evaluate the competing risk of fetal demise in an ongoing pregnancy while considering the risk of neonatal morbidity and death after elective caesarean delivery.

CAESAREAN SECTIONS AND MATERNAL MORBIDITY AND MORTALITY

Caesarean sections can be elective or emergency with both classes categorized by different medical indications. The common indications for primary caesarean delivery are labor dystocia, fetal malpresentation, fetal and maternal distress, placenta praevia grade 4, triplets, and fetal macrosomia. However, the commonest factor responsible for the increasing number of caesarean sections appears to be previous caesarean delivery. Whatever the indication, the rate of elective primary caesarean delivery continues to rise with the widespread perception that the procedure is of little or no risk to healthy women. According to Liu *et al*.¹⁹, planned caesarean deliveries are associated with increased postpartum risks of cardiac arrest, wound hematoma, hysterectomy, major puerperal infection, anesthetic complications, venous thromboembolism and hemorrhage requiring hysterectomy, and longer hospital stay as compared to planned vaginal deliveries, but a lower risk of hemorrhage requiring blood transfusion. These severe morbidities require attention. The relative risk of short-term maternal morbidity of planned caesarean section versus planned vaginal delivery will depend on the proportion of women in each group ultimately delivering in the planned manner and the frequency with which delivery

occurs by an alternative unplanned method.²⁰ Interestingly, although a confidential enquiry into maternal deaths conducted in the United Kingdom showed a significantly higher risk of maternal death associated with caesarean section the extent of the finding showed an inability to distinguish deaths associated with underlying maternal diseases from those attributable to the obstetric procedure.²¹

GLOBAL TRENDS

Since 1985, the international healthcare community has considered the ideal rate for caesarean sections to be between 10 and 15 per 100 live births to optimize maternal and neonatal outcomes. Since then, it has been commonly accepted in both developed and developing countries. Currently, there is no internationally accepted classification system for caesarean section that would allow meaningful and relevant comparisons of caesarean section rates across different facilities, cities or regions.²² In 2014, WHO proposed the *Robson classification system* (**Figure 1**) as a global standard for assessing, monitoring and comparing caesarean section rates within healthcare facilities over time, and between facilities.²² Caesarean section rates show a wide variation among countries in the world, ranging from 0.4 to 40%, and a continuous rise in the trend has been observed over the past 30 years.²³ Althabe *et al.*²⁴ studied the data from 119 countries from 1991 to 2003, which were classified into 3 categories: low-income (59), medium-income (31), and high-income (29) countries according to an international classification to assess the ecological association between national caesarean section rates and maternal and neonatal mortality by applying multiple linear regression models. Seventy-six percent of the low-income countries, 16% of the medium-income countries, and 3% of high-income countries showed caesarean section

rates between 0 and 10%, and the 3% of low-income countries, 36% of medium-income countries, and 31% of high-income countries showed caesarean section rates above 20%.²⁴ Latin America and the Caribbean show the highest rate (29.2%) of caesarean delivery, and Africa shows the lowest (3.5%).²⁵ Zizza *et al.*²⁶ reported that in 47.2% of the countries, the caesarean section rate exceeded 15% especially in the countries of Latin America and the Caribbean along with Europe, North America and Oceania, and found an inverse association between caesarean section rates and maternal and neonatal mortality for all geographical areas except for Europe. Molina *et al.*²⁷ studied the annual caesarean delivery rates from data collected during 2005 to 2012 for all 194 WHO member states and concluded that caesarean delivery rates of up to approximately 19 per 100 live births were associated with lower maternal or neonatal mortality among WHO member states. Adopting the Robson classification system as a global standard for assessing, monitoring and comparing caesarean section rates within healthcare facilities over time, and between facilities remains imperative.

CONCLUSION

Increasing cases of caesarean deliveries are responsible for the gross health inequity among the various income groups at the national and global level. On one hand, low and middle-income countries should improve their accessibility to this medical help, which could decrease adverse maternal and neonatal outcomes, while on the other, high-income countries should reduce overuse to avoid and minimize added morbidity and financial burden at the national and global level. From a public health perspective, there is still a huge dilemma about the desirable rate of caesarean sections.

Box 1: Robson classification



Figure 1: Robson Classification for assessing and monitoring caesarean sections (Ref 22)

The 'Robson classifications, widely used in many countries are simple, robust and reproducible with clinical relevance and derived from five obstetric characteristics often encountered in maternities: parity (nulliparous, multiparous with and without previous caesarean section); onset of labor (spontaneous, induced or pre-labor caesarean section); gestational age (preterm or term); fetal presentation (cephalic, breech or transverse) and number of fetuses (single or multiple).

We strongly recommend that the government and policy makers should emphasize on caesarean sections only for medically indicated cases rather than acquiring a desirable rate. Based on available data, and using internationally accepted methods to assess the evidence with the most appropriate analytical techniques, the following conclusions can be derived: “[1] Caesarean sections are effective in saving maternal and infant lives, but only when they are required for medically indicated reasons; [2] At population level, caesarean section rates higher than 10% are not associated with reductions in maternal and newborn mortality rates; [3] Caesarean sections can cause significant and sometimes permanent complications, disability or death particularly in settings that lack the facilities and/or capacity to properly conduct safe surgery and treat surgical complications. Caesarean sections should ideally only be undertaken when medically necessary; [4] Every effort should be made to provide caesarean sections to women in need, rather than striving to achieve a specific rate; and [5] The effects of caesarean section rates on other outcomes, such as maternal and perinatal morbidity, paediatric outcomes, and psychological or social well-being are still unclear”. More research is needed to understand the health effects of caesarean section on immediate and future outcomes.

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