Mode of delivery and obstetric outcomes in Asia

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Evaluation of: Lumbiganon P, Laopaiboon M, Gulmezoglu A et al.: Method of delivery and pregnancy outcomes in Asia: the WHO global survey on maternal and perinatal health 2007–2008. Lancet 375(9713), 490–499 (2010). In a multinational survey of 122 medical facilities in nine Asian countries, the WHO analyzed data on 107,950 deliveries. Compared with spontaneous vaginal deliveries, any type of cesarean was associated with a 2.7–14.5-fold increase in the odds of the maternal mortality and morbidity index. Antepartum cesarean with indications and intrapartum cesarean demonstrated similar perinatal outcomes when compared with spontaneous vaginal delivery; patients who underwent an intrapartum cesarean without indication had a 2.1-fold increase in the odds of the perinatal mortality and morbidity index. Cesarean delivery decreased perinatal morbidity when performed for noncephalic presentation. Operative vaginal deliveries were also associated with a 2.1-fold increase in the odds of maternal morbidity or mortality with a concomitant 1.9-fold increase in the odds of perinatal morbidity and mortality.

Lumbiganon and colleagues report on a large multinational WHO survey on the mode of delivery and pregnancy outcomes in Asia [1]. The rate of cesarean delivery in a region has been used as a marker of maternal mortality; cesarean rates below 5% have been associated with the highest maternal mortality rates [2]. Others have shown that maternal mortality decreases as cesarean rates climb to 10%, but no improvement in maternal mortality rates occurs after a cesarean rate of 10% is reached [3]. A survey conducted by the WHO in Latin America, similar to the one reported by Lumbiganon et al. in Asia, demonstrated an increase in prematurity and neonatal morbidity as the cesarean rate increased from 10 to 20% [4].

Despite these findings, and despite a WHO recommendation that the ideal cesarean rate is approximately 15% [5], the rate of cesarean deliveries has continued to increase in developed and developing nations, reaching 30–40% in some parts of the world [6]. These increases have occurred without any evidence of improvement in maternal or neonatal morbidity or mortality.

In this large prospective cohort, the relationship between the mode of delivery, maternal morbidity and neonatal morbidity is examined in Asian countries.

Summary of methods & results

Lumbiganon et al. report the results of a WHO observational study in Asia that was designed to investigate the relationship between mode of delivery and maternal and perinatal outcomes. Up to seven facilities in the capital city and two regions/provinces in each of nine countries were selected for observation, totaling 122 facilities. Data were collected on patients in each facility for 2–3 months from October 2007 to May 2008. A total of 107,950 deliveries were analyzed in this study.

Of these 107,950 deliveries, 29,428 (27.3%) deliveries were via cesarean. Cesarean deliveries were divided into those occurring prior to labor (antepartum) or during labor (intrapartum) and into those with or without indications. Commonly reported indications included prior cesarean, cephalopelvic disproportion, fetal distress and abnormal presentation. Of the 12,368 antepartum cesarean deliveries, 1515 were without indications and 10,853 were with indications. Of the 17,060 intrapartum cesarean deliveries performed, 554 were performed without indications and 16,506 were performed with indications for cesarean delivery. Compared with spontaneous vaginal deliveries, any type of cesarean was associated with a 2.7–14.5-fold increase in the odds of the maternal mortality and morbidity index (defined as the presence of at least one of the following: maternal mortality, admission to an intensive care unit, blood transfusion, hysterectomy or internal iliac artery ligation), although intrapartum cesarean deliveries were associated with the greatest risk.

Unfortunately, these increases in maternal morbidity and mortality were not accompanied by associated decreases in the infant morbidity and mortality index (defined as perinatal death or a stay in a neonatal intensive care unit for 7 days or longer). Antepartum cesareans with an indication and intrapartum cesareans had similar perinatal outcomes when compared to spontaneous vaginal deliveries; patients who underwent an intrapartum cesarean without indication had a 2.1-fold increase in the odds of the perinatal mortality and morbidity index. Cesarean delivery decreased perinatal morbidity when performed for noncephalic presentation. Operative vaginal deliveries were also associated with a 2.1-fold increase in the odds of maternal morbidity or mortality with a concomitant 1.9-fold increase in the odds of perinatal morbidity and mortality.
with spontaneous vaginal delivery; patients who underwent an intrapartum cesarean without indications had a 2.1-fold increase in the odds of the perinatal mortality and morbidity index. However, when noncephalic presentations were analyzed separately, both antepartum and intrapartum cesarean deliveries were demonstrated to decrease the perinatal morbidity and mortality index. It was noted that cesarean deliveries for babies in the breech position were associated with an increased risk of stay in the neonatal ICU.

Operative vaginal deliveries comprised 4.4% of vaginal deliveries. Operative vaginal deliveries were also associated with a 2.1-fold increase in the odds of maternal morbidity or mortality with a concomitant 1.9-fold increase in the odds of perinatal morbidity and mortality.

**Significance**

This study found significant associations between cesarean delivery and maternal morbidity, without any improvement in perinatal morbidity. The only exception to this finding was in patients undergoing cesarean delivery for noncephalic presentations; in this population, improvements in neonatal mortality were observed with cesarean deliveries.

The observational nature of the study makes it impossible to rule out confounding by indication as a source of these findings. Essentially, it is not possible to determine whether women who delivered by cesarean or operative vaginal deliveries had worse outcomes owing to the cesarean or operative vaginal delivery or owing to the reason for the cesarean or operative vaginal delivery. However, the fact that women who underwent cesarean without indication also experienced an increase in morbidity suggests that the association is real.

In developed countries, cesarean delivery has become commonplace, with many women even requesting an elective primary cesarean surgery. These findings add to the growing body of evidence that call into question the practice of performing elective cesarean deliveries. Although this study included women and facilities in developing nations, similar studies in developed countries have found similar associations between the mode of delivery and maternal morbidity, albeit to a smaller degree.

**Future perspective**

In order to prevent the continuing increase in the number of cesarean deliveries, an analysis of the factors that are contributing to this rise is necessary. Different factors are likely to contribute to the cesarean rate (i.e., medicolegal concerns and financial incentives) in developed and developing countries; if our goal is to decrease the rates of cesarean delivery in order to optimize both maternal and perinatal outcomes, then the reasons for the increasing rates need to be elucidated and addressed.

**Financial & competing interests disclosure**

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**Executive summary**

- Cesarean delivery rates have increased worldwide.
- In this study, cesarean delivery was associated with a 2.7–14.5-fold increase in the rate of maternal morbidity. Perinatal morbidity was not improved and in some cases was increased with cesarean delivery.
- Cesarean delivery for noncephalic presentations resulted in a decrease in perinatal morbidity and mortality.

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