OBSTETRICS

Cesarean delivery on maternal request in China: what are the risks and benefits?

Xiaohua Liu, MD; Mark B. Landon, MD; Weiwei Cheng, MD, PhD; Yan Chen, MBBS

OBJECTIVE: The purpose of this study was to describe the risks and benefits of cesarean delivery on maternal request (CDMR) in a Chinese population.

STUDY DESIGN: A retrospective cohort study of mode of delivery was conducted at the largest obstetric center in Shanghai, China, from 2007-2013. Eligibility criteria included singleton term nulliparous women with vertex presentation; women with major fetal anomalies or stillbirth before labor were excluded.

RESULTS: A total of 66,226 women were included in the analysis: 40,560 women (61.2%) had planned vaginal birth, with 32,833 spontaneous vaginal deliveries (80.9%), 4990 intrapartum CDs (12.3%), and 2737 assisted vaginal deliveries (6.7%). A total of 16,333 women (24.7%) underwent CDMR. We observed no significant difference between the CDMR and planned vaginal delivery groups in the frequencies of maternal intensive care unit admission (0.2% vs 0.2%), severe postpartum hemorrhage (0.5% vs 0.5%), maternal infection (1.3% vs 1.3%), organ injuries (0.4‰ vs 0.5‰), and thromboembolic disorders (0.1‰ vs 0.1‰). The perinatal mortality rate was similar in the 2 groups (0.4‰ vs 0.6‰; adjusted odds ratio, 0.51; 95% confidence interval, 0.20—1.30; $P = .159$). The frequencies of birth trauma (0.2‰ vs 1.1‰), neonatal infection (0.4% vs 0.7%), hypoxic ischemic encephalopathy (0.4‰ vs 1.8‰), and meconium aspiration syndrome (0.2‰ vs 0.6‰) were lower; the frequency of respiratory-distress syndrome (0.6% vs 0.4%) was higher in the CDMR group.

CONCLUSION: Compared with nulliparous women who tried vaginal delivery, women who underwent CDMR had similar short-term maternal outcomes with some neonatal benefit.

Key words: cesarean delivery, China, maternal morbidity, perinatal death

Cite this article as: Liu X, Landon MB, Cheng W, et al. Cesarean delivery on maternal request in China: what are the risks and benefits? Am J Obstet Gynecol 2015;212:817.e1-9.

Many nonmedical and medical factors, including provider's and patient's perception of safety, have contributed to a worldwide increase in the rate of cesarean delivery (CD).[1] The World Health Organization global survey (2010) on maternal and perinatal health in Asia reported that the average CD rate was 27.3%; China had a disproportionately high rate of CDs of 46.2% with an 11.7% rate of procedures performed without medical indication, which is the highest in the world.[2] At the present time, nonindicated CD on maternal request (CDMR) actually has become the most common reason for CD in most developed areas of China.[3,4] Yet, the immediate risks and benefits of CDMR in China have not been evaluated.

The lack of data on the risks and benefits of CDMR is not unique to China; as with other countries, there is difficulty identifying cases of CDMR. An exhaustive review of CDMR risks and benefits was published in a technical report by the Agency for Health Research and Quality that, in addition to other published reviews, concluded that there are few well-conducted studies that have evaluated outcomes associated with CDMR.[5,6] The difficulty categorizing cases and a lack of randomized trials (which are unlikely to be undertaken) has resulted in low-quality evidence concerning the risks and benefits of CDMR. We thus conducted a retrospective cohort study to describe the risks and benefits of CDMR in a well-characterized Chinese population.

From the Department of Obstetrics, International Peace Maternity and Child Health Hospital, Shanghai Jiaotong University. Shanghai, China (Drs Liu, Cheng, and Chen); and the Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, The Ohio State University College of Medicine, Columbus, OH (Dr Landon).

Received Oct. 7, 2014; revised Dec. 8, 2014; accepted Jan. 27, 2015.

The authors report no conflict of interest.

Corresponding author: Xiaohua Liu, MD. Annaabcd114@hotmail.com

0002-9378/$36.00

http://dx.doi.org/10.1016/j.ajog.2015.01.043

Methods

Study design

We examined data from all pregnant women who received care at the International Peace Maternity & Child Healthcare Hospital (IPMCHH), Shanghai Jiaotong University from Jan. 1, 2007, through Dec. 31, 2013. IPMCHH is the largest obstetric care center in Shanghai, with 11,000-16,000 annual deliveries; >90% women are nulliparous because of the 1-child policy in China.

Study population

Eligibility criteria for the current study included singleton term nulliparous women with vertex presentation; women with major fetal anomalies or stillbirth before hospital admission and multiparous women were excluded.

Data collection

The IPMCHH research group and information engineer extracted and abstracted data from the hospital electronic medical record according to criteria set forth on the standardized data collection form. Types of information that were abstracted included maternal demographic characteristics, medical history, reproductive and prenatal history, labor and delivery summaries, and postpartum and neonatal information. The data were then deidentified before analysis. The study was approved by the ethics review board at IPMCHH and the institutional review board at The Ohio State University.

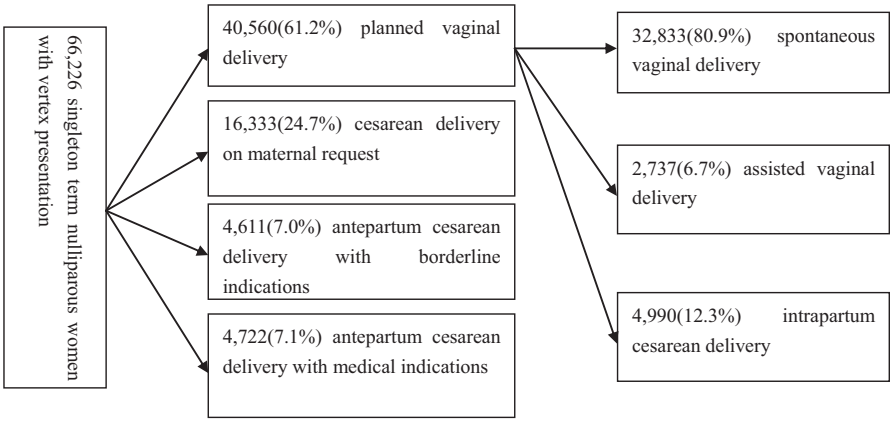
Operational definitions

Labor was defined as regular uterine contractions and cervical dilation of ≥2 cm. CD performed before labor was categorized as an antepartum CD, whereas intrapartum CD was an operation performed after a trial of labor. *CDMR* was defined as an antepartum cesarean delivery that was performed on maternal request without medical indications. Cases of CDMR could be identified in this study because IPMCHH requires that a signed patient consent form that outlines the risks and benefits of CD be retained in the medical record. In this study, in addition to CDMR, there were 2 types of antepartum CD that included indicated CD and CD with borderline indications listed (such as postterm/postdates, diabetes mellitus, chorioamnionitis, obesity, chronic or gestational hypertension without preeclampsia/eclampsia, premature rupture of the membranes, human papillomavirus infection, group B streptococcus positive, and polyhydramnios. Planned vaginal deliveries included all deliveries after a trial of labor: spontaneous vaginal birth, assisted vaginal delivery (vacuum or forceps), or intrapartum CD performed because of abnormal progress of labor or nonreassuring fetal heart rate status.

Maternal death was defined as death during the first 6 weeks after delivery. Severe postpartum hemorrhage (PPH) included those women who met at least 1 of following criteria: required blood transfusion, postpartum decrease of hemoglobin ≥4 g/dL-1 (the last hemoglobin value before delivery was considered to be the reference), required Bakri balloon placement, placement of B-Lynch suture, uterine artery embolization or hysterectomy, dilation for bleeding, or retained placental tissue. *Mild PPH* was defined as estimated blood loss >500 mL in the first 24 hours after vaginal delivery and after CD but could not meet the criteria of severe PPH. Maternal infection was defined as maternal fever of at least 38.5°C on 2 occasions at least 24 hours apart (not including the first 24 hours), pneumonia, urinary tract infection, pelvic inflammatory diseases, wound infection, wound dehiscence, or breakdown. Maternal organ injury included third- or fourth-degree perineum laceration, genital-tract fistula, rectum injuries, cervical laceration that involved the lower uterine segment (in the case of a vaginal delivery), and injuries to intraperitoneal organs such as bladder, ureter, and intestine. Maternal thromboembolic disorders included deep-vein thrombosis, pulmonary embolism, and amniotic fluid embolism. The incidence of maternal transfer to the intensive care unit (ICU) was included as maternal outcome. The occurrence of complications was also counted accordingly if the women were readmitted to the hospital.

Perinatal death was defined as intrapartum stillbirth or neonatal death at <28 days of age. Birth trauma included subdural hematoma, intracerebral or intraventricular hemorrhage (diagnosed based on the combination of abnormal neurologic examination with computer tomography scan finding), basal skull fracture, and/or facial or brachial plexus nerve injury that was present at discharge from hospital. Neonatal infection included pneumonia, sepsis, meningitis, or antibiotic treatment for ≥3 days. The other neonatal morbidity included hypoxic ischemic encephalopathy, meconium aspiration syndrome, respiratory-distress syndrome, and necrotizing enterocolitis. The incidence of neonatal ICU (NICU) admission was also used as neonatal outcome.

FIGURE
Flow chart of the study population



Liu. Outcomes of cesarean delivery on maternal request. Am J Obstet Gynecol 2015.

Covariates

Based on review of the literature, the following covariates were considered to be potential confounders or effect modifiers: maternal age, prepregnancy body mass index, education, insurance status, marital status, type of conception, birthweight, gestational week at delivery, group B streptococcus infection and sexually transmitted diseases, maternal chronic medical conditions, and pregnancy complications.

Statistical analysis

Deidentified annual data were concatenated to create a single large dataset.