

# An Impact Study of Availability of Epidural Labor Analgesia on the Rate of Cesarean Delivery – A Report from the Chinese No Pain Labor N’ Delivery Experience

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## Introduction:

- The current neuraxial labor analgesia rate in China is < 1% and the cesarean delivery rate approaches 50%. The rate of cesarean delivery on maternal request (no medical indication) is the highest in the world (11.7%) with a total of approximately 2 million deliveries annually.<sup>1</sup>
- Although randomized controlled trials in Western countries suggest that neuraxial labor analgesia does not increase the risk of cesarean delivery, its impact on operative vaginal delivery and other patient safety outcomes is still controversial, and its impact in developing countries has not been examined.

## Objective:

- The purpose of this study was to evaluate the impact of the introduction of neuraxial labor analgesia on mode of delivery in a single Chinese hospital.

## Methods:

- The modified No Pain Labor N’ Delivery Protocol, derived from the current practice at Prentice Women Hospital, was used (epidural 0.075-0.1% ropivacaine and sufentanil 0.1-0.2 µg/mL, initiation with 20-mL bolus followed by a continuous infusion). No parenteral opioids or other pharmacological methods for maternal pain relief in labor were available.
- The obstetric anesthesia service was initiated on January 11, 2010 from Monday-Friday from 0800 to 1730, became 24/7 on July 17, 2010, and became part of a fee-for-service incentive stimulation package on November 12, 2010.
- One of the investigators (LQH) visited the hospital and spent one day educating pregnant women, and medical staff of the local obstetric service and the hospital administrators/department leaders on August 28, 2010.
- Data were collected from hospital databases from the Shijiazhuang Obstetrics and Gynecology Hospital between August 2009 and August 2011.
- Clinical outcomes included the total number of deliveries and mode of delivery, indications for cesarean delivery, overall hospital clinic visits and hospital admissions, 5-min Apgar score ≤ 3, 7-day infant death, postpartum hemorrhage, and maternal death.
- Data were compared among three periods: Aug – Dec 2009 (baseline neuraxial labor analgesia rate 0%), Jan – Aug 2010 (phase-in; neuraxial labor analgesia rate increased from 4.6% to 40.3%), and Sep 2010 – Aug 2011 (final phase; neuraxial labor analgesia rate > 45%) using  $X^2$  or one-way ANOVA.

Figure 1: Mode of Delivery

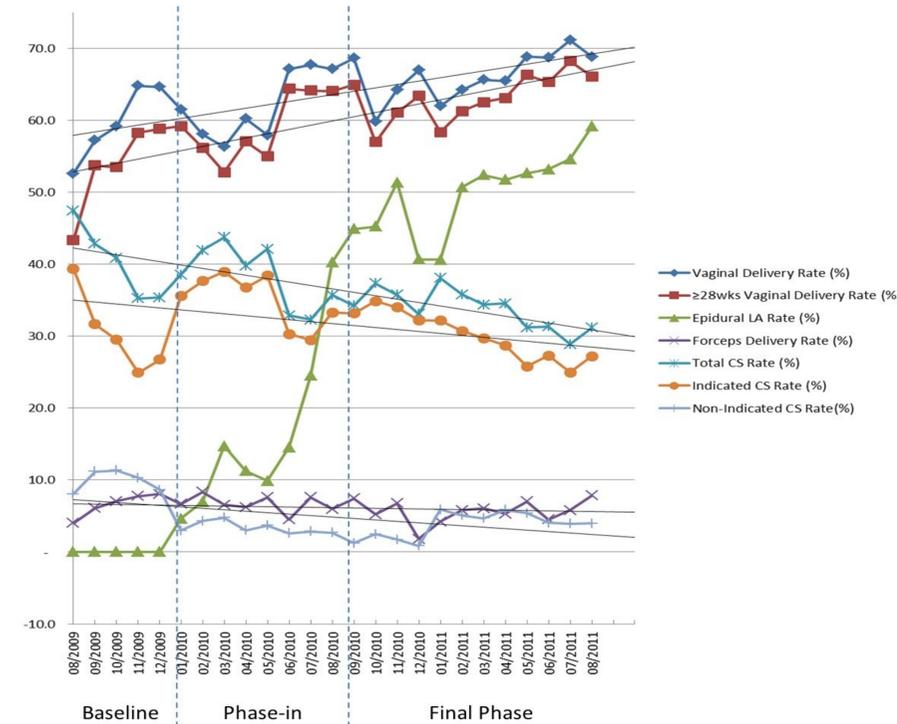
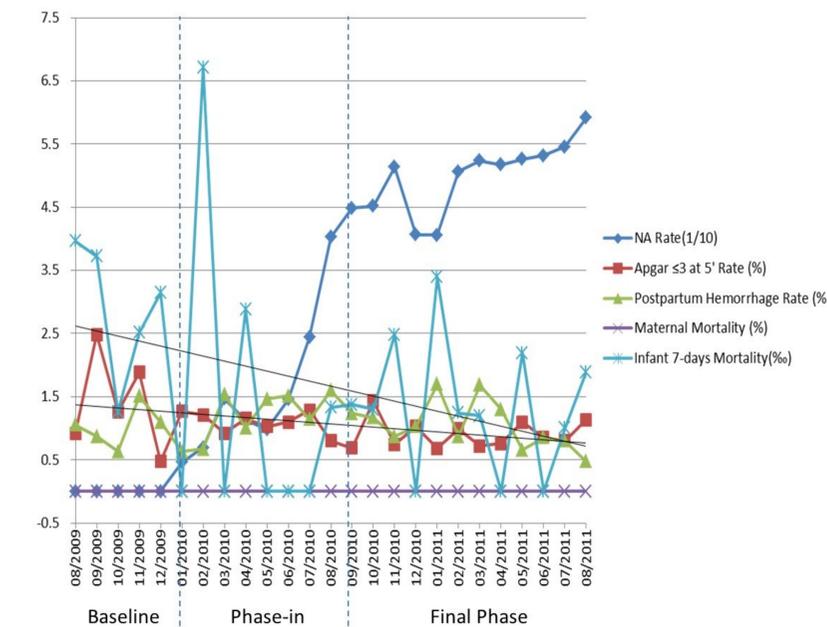


Figure 2: Maternal and Infant Safety Markers



## Results:

- 19,938 deliveries in the 25-month study period.
- The rate of neuraxial labor analgesia increased from 0% to 59% and the monthly delivery rate increased from 757 to 1056 per month.
- The mode of delivery data are shown in Figure 1. Figure 2 illustrates the incidences of maternal and perinatal death, postpartum hemorrhage, and 5-min Apgar score ≤ 3.
- There was a significant difference in the cesarean delivery rate between the initial and phase-in epochs (-2.3%, 95% CI of difference -0.3% to -4.3%,  $P = 0.03$ ) and the phase-in and final epochs (-4.5%, 95% CI of the difference -0.3% to -6.0%,  $P < 0.001$ ). Medically indicated cesarean delivery were performed in 30% of women in both the baseline and post implementation periods (difference -0.008, 99% CI -0.015 to 0.030,  $P = 0.37$ ), whereas non-medically indicated cesarean delivery decreased as a fraction of the total cesarean delivery rate by 13% (99% CI -16% to -10%,  $P < 0.0001$ ).
- The rate of operative vaginal delivery did not change.
- The incidence of 5-min Apgar score ≤ 3 decreased from 1.4% to 1.1% to 0.9% ( $P < 0.001$ ).
- The number of clinic visits per delivery (47.6) and the hospital admissions per delivery (2.2) did not change.

## Conclusion:

- The important finding is that the introduction of neuraxial labor analgesia management was associated with a lower non-medical indicated cesarean delivery rate as well as the number of neonates with low Apgar scores.
- No markers of safety were worsened by the introduction of the labor analgesia service.
- We suggest that the introduction of neuraxial labor analgesia to Chinese women may be one method to improve labor and delivery outcomes.

## References:

- 1) Lumbiganon P, Laopaiboon M, et al. World Health Organization Global Survey on Maternal and Perinatal Health Research Group: Method of delivery and pregnancy outcomes in Asia: the WHO global survey on maternal and perinatal health 2007-08. *Lancet* 2010, 375:490-498.