
LETTER TO THE EDITOR

LABOR EPIDURAL ANALGESIA AND PROSTAGLANDIN-MEDIATED INTRAPARTUM “SHIVERING”

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Abstract

The insight into the intrapartum plasma concentrations of prostaglandins (PGE1, PGE2 and PGF2alpha) and oxytocin can add to our understanding whether labor analgesia methods are working in tandem with spontaneously fluctuating endogenous uterotonics in the laboring patients to become evident as under-recognized intrapartum “shivering”.

Keywords: Shivering; Obstetrical Analgesia; Prostaglandins; Misoprostol

Letter to Editor

Case Vignette A: After lumbar epidural bolus for intrapartum analgesia, a laboring patient starts shivering with each labor contraction without realizing either her contraction or her shivering. Is this feasible?

Case Vignette B: After lumbar epidural initiation for intrapartum analgesia, a laboring patient records low body temperature without realizing either feeling of her being cold or her dangerous hypothermia. Is this possible?

The first question is: Does the body always realize that it is hypothermic? Secondary to some underlying risk factors and subtleties in neurological presentation, the body sometimes may NOT always realize that it is hypothermic and this may turn the dangerous scenario into a critical one.

The next question is: Does labor epidural analgesia induce hypothermia? Although higher concentration local anesthetics-based epidural anesthesia induces body heat redistribution, lower concentration local anesthetics-based epidural analgesia does NOT change the slope of intrapartum changes in body temperature¹. However, it is interesting that almost 50% of pregnant patients have negatively sloping temperature change during labor indicating that irrespective of labor epidurals, truly “feeling cold” during labor is almost as likely as truly “feeling hot” during labor¹.

The next question is: Does labor epidural analgesia cause shivering? While non-thermoregulatory “shivering” is very common with epidural anesthesia², thermoregulatory shivering itself can happen during the initial stages of either hypothermia or hyperthermia. Essentially, during thermoregulatory shivering, the muscles are involuntarily working hard to normalize body

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temperature and while sometimes failing to do so, this involuntary muscular activity some other times overshoots beyond its intended goal.

The next question is: Is “shivering” during labor epidural analgesia uniquely different? It is a well-known and extensively-reported fact that naturally occurring prostaglandin E1 (PGE1)³ and its synthetic analogue misoprostol⁴ induce body temperature changes with the associated very common occurrence of “shivering”. Although synthetic analogues of PGE1 have been used during obstetrical care (induction of labor and control of postpartum hemorrhage), the fluctuations of naturally occurring PGE1 as a natural physiological phenomena during labor has been reported, too⁵.

The final question is: Is the under-recognized “shivering” during labor epidural analgesia indicating towards spontaneously fluctuating intrapartum ratios of plasma prostaglandins (PGE1, PGE2 and PGF2alpha) and plasma oxytocin? This question can be validated or refuted easily by planning a randomized controlled study. Healthy pregnant patients can be randomly assigned to receive labor epidural analgesia or remifentanyl labor analgesia during spontaneous labor.

Thereafter, intrapartum blood samples can be drawn at regular intervals as correlating with the onset-offset of uterine contractions. This can quantify if labor epidural analgesia affects the trends (and ratios) of plasma concentrations of PGE1, PGE2, PGF2alpha and oxytocin before-during-after uterine contractions. These biochemical changes can be concurrently investigated for correlation with (a) uterine electrical activity by intrapartum electrohysterography, (b) clinical observation for symptomatic changes in body temperature, and (c) independently trending temporal incidence of intrapartum “shivering”.

In Summary, irrespective of labor analgesia methods, the prevalence of symptomatic thermoregulatory (or even non-thermoregulatory) changes during labor warrants standardized temperature monitoring to recognize early and manage the laboring patients accordingly. Moreover, the insight into the intrapartum plasma concentrations of PGE1, PGE2, PGF2alpha and oxytocin can add to our understanding whether labor analgesia methods are working in tandem with spontaneously fluctuating endogenous uterotonic in the laboring patients to become evident as under-recognized intrapartum “shivering”.

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